Delivering environmental benefits through entry-level agri-environment schemes in the EU

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ACRONYMS

ADAS	UK agricultural, environmental and rural development consultancy
AFI	Agri-environmental Footprint Index
BAP	Biodiversity Action Plan
BTO	British Trust for Ornithology
BSPB	Bulgarian Society for the Protection of Birds
CAD	Contrat d'Agriculture Durable (France)
CAP	Common Agricultural Policy
CMEF	Common Monitoring and Evaluation Framework
CSL	Central Science Laboratory (UK)
CTE	Contrat Territorial d'Exploitation (France)
Defra	Department of Food and Rural Affairs (England, UK)
EAFRD	European Agricultural Fund for Rural Development
ELS	Entry Level Stewardship (England, UK)
EU-10	The 10 'new' Member States before the accession of Bulgaria and Romania
EU-12	The 12 'new' Member States of the EU
EU-15	The 15 'old' Member States of the EU
EU-15OR	The seven RDPs in the outermost regions of the EU
EU-27	The 27 Member States of the EU
EU-27C	The 81 Rural Development Programmes in the continental regions of the EU
ENRD	European Network for Rural Development
ESA	Environmentally Sensitive Area
ES	Environmental Stewardship (agri-environment scheme in England, UK)
FAS	Farm Advisory Service
FERA	Food and Environment Research Agency (UK)
GAEC	Good Agricultural and Environmental Condition
GFP	Good Farming Practice
GHG	Greenhouse gas
HLS	Higher Level Stewardship (England, UK)
HNV	High Nature Value
IBA	Important Bird Area
IUCN	International Union for Conservation of Nature
LFA	Less Favoured Area

LMO	Land Managers' Options (Scotland, UK)
LPIS	Land Parcel Information System
LU	Livestock Unit
MEKA	Marktentlastungs- und Kulturlandschaftsausgleich (agri-environment scheme in Baden Württemberg, Germany)
MoA	Ministry of Agriculture
MTE	Mid term evaluation
NAAS	National Agricultural Advisory Service (Bulgaria)
NFU	National Farmers Union (UK)
NGO	Non-governmental organisation
OELS	Organic Entry Level Stewardship (England, UK)
NVZ	Nitrate Vulnerable Zone
PDRH	Plan de développement rural hexagonal (France)
PHAE	Prime à l'herbe agri-environnementale (France)
PPP	Plant Protection Products
RDC	Rural Development Contract (Scotland, UK)
RDP	Rural Development Programme
RICS	Royal Institute of Chartered Surveyors (UK)
RMIF	Red Meat Industry Forum
RP	Rural Priorities (RDP scheme, Scotland, UK)
RSPB	Royal Society for the Protection of Birds (UK)
SAPARD	Special Accession Programme for Agriculture and Rural Development
SAPS	Single Area Payment Scheme
SMP	Soil Management Plan (UK)
SMR	Statutory Management Requirement
SPR	Soil Protection Review (UK)
SRDP	Scotland Rural Development Programme
UAA	Utilisable Agricultural Area
UNDP	United Nations Development Programme

EXECUTIVE SUMMARY

Agri-environment programmes are a long-established part of the CAP and now a key policy tool in the delivery of EU environmental priorities on farmland. The purpose of this study is to gain a better understanding of the nature and diversity of entry-level agri-environment schemes throughout the EU-27, in the context of the 2007-13 RDPs. 'Entry-level' is a relative term describing environmental management which varies from one RDP to another but is designed to deliver incremental improvements just above the environmental reference level which all farmers must observe as the baseline for agri-environment payments. There have been no systematic studies at EU level specifically of entry-level agri-environment management, nor any attempt to provide a comprehensive typology.

Management actions are the day-to-day practices used across the farmland to grow crops, produce livestock and safeguard environmental resources, and can be regarded as the building blocks of all agri-environment schemes and of the reference level that underpins them. Management actions can be defined precisely, and for this reason were chosen as the common unit of analysis for developing the typology and analysing the agri-environment schemes in the 88 RDPs. The scope of this study does not include agri-environment management that was considered to be higher-level, such as the creation or restoration of landscape features and habitats or significant changes to the whole farming system, nor does it cover agri-environment support for organic farming, integrated production and genetic resources.

In the first stage of the study a typology of entry-level agri-environment management in EU-27 was developed, based on detailed information extracted from all the 2007-13 RDPs (including those for the outermost regions) and related sources.

A typology of entry-level agri-environment management in the 2007-13 RDPs

A detailed analysis of agri-environment schemes in all 88 of the 2007-13 Rural Development Programmes (RDPs) across the EU-27 revealed a total of 63 different types of entry-level agri-environment management actions, which can be grouped into 15 broad categories. For the purpose of developing the typology nine EU-wide environmental objectives were selected: farmland biodiversity; agricultural landscapes; water quality; water availability; soil functionality; climate change mitigation; climate change adaptation; resilience to flooding; and resilience to fire. The potential contribution of each of the 63 different types of entry-level management actions to each of the nine environmental objectives was assessed, and formed the basis for the typology, which also reflects the frequency of occurrence of the broad categories of management actions in RDPs across the EU.

The typology shows that all of the 63 types of entry-level management action have the potential to contribute (directly or indirectly) to at least two of the nine environmental objectives, and that almost all of them have the potential to contribute to farmland biodiversity and climate change adaptation. Some types of management action are much more 'multi-objective' than others, notably the *maintenance of permanent pasture, fallow, traditional management, management of water features in the landscape and water levels, and taking and maintaining land out of production* which, together with the two non-land-

based categories of *management plans and record keeping* and *training*, have the potential to contribute directly or indirectly to all nine objectives.

There are two important caveats to bear in mind in using the typology. Firstly, the contribution of different types of management action to the environmental objectives is described as 'potential' because the actual contribution is very often context specific and dependent upon a range of factors, such as how and where the management actions are implemented and the level of uptake across a region or target area. Secondly, the typology uses a subjective categorisation of management actions for the purpose of analysis, but within agri-environment schemes management actions are often presented quite differently, for example in 'packages' of multiple actions linked to a specific payment under the scheme.

The different types of entry-level management action present in the 88 RDPs

All 88 RDPs were scanned for the presence of each of the 63 types of management action although it was not possible to assess the relative importance of each within an RDP, either in terms of budget allocations or uptake. For the 81 RDPs in 'continental' Europe, the nine most widely represented categories of management actions are the *management of grass and semi-natural forage* (95 per cent of RDPs), *input management* (91 per cent), *management plans and record keeping* (79 per cent) *management of soil cover* (79 per cent) and *soil management* (69 per cent), *buffer strips* (64 per cent), *crop management* (60 per cent) and *landscape feature management* (58 per cent). The least well represented is *training* which occurs as a component of agri-environment schemes in only a few RDPs (15 per cent), although it is possible that relevant training may be provided separately under Axis 1 measures. Agri-environment schemes in the EU-12 Member States contain on average fewer types of action than those from the EU-15, with *management plans and record keeping* and *soil management* less well represented and *crop management* slightly more prominent. However the range in number of types of action per RDP, from five to more than 25, is striking in both groups and varies even between regions of federal Member States. The balance types of management actions present within RDPs appear to be largely independent of broad bio-climatic regions in continental Europe, but may this may simply be because the resolution is too coarse to identify climatic differences influencing the choice of management actions at the RDP level. Of the nine outermost regions of the EU, seven have RDPs. Despite their very different farming systems, all include entry-level agri-environment actions to restrict inputs and manage landscape features, and across the seven almost all of the 15 categories are represented, with the exception only of *management for wildlife* and taking or maintaining *land out of production*.

The ten most significant categories of management actions, in terms of presence with EU-27 RDPs, are examined in detail, considering their distribution across the EU, the way they are grouped within RDPs and the range of management prescriptions specified (for example, grazing and mowing regimes, restrictions on fertiliser and other inputs, soil management techniques and crop rotations). This analysis is illustrated by examples from individual RDPs.

Structure and context of selected entry-level agri-environment schemes

In the second stage of the study selected entry-level agri-environment schemes in ten RDPs across seven Member States (Bulgaria, Czech Republic, Finland, France, Italy, Poland and

UK) were studied in more detail. These were chosen to represent a diversity of farm structures, environmental problems and opportunities, biophysical and policy contexts, and include both old (EU-15) and new (EU-12) Member States. For the latter agri-environment implementation is relatively new and their farming sector is still in the process of phasing in other CAP policies.

Despite this diversity there were some common environmental themes apparent in the case studies, including the protection and management of soils, reducing diffuse pollution, and extensive management of grasslands, and in some Member States a focus on biodiversity protection. These were underpinned to varying extents by national or EU derived targets, and it is clear that some entry-level schemes are the main tool for delivering key environmental policies at national level. In all but one of the case studies entry-level schemes were delivered within a programme that also included higher-level schemes. The choice offered to farmers ranged from an all-compulsory entry-level scheme in Finland to a free-choice menu in the UK. One entry-level scheme offers farmers a choice not just of agri-environment management options, but also of forestry and Axis 1 and 3 options too. The relative importance of agri-environment schemes within the RDPs also varies considerably.

At farm and institutional level the agri-environment schemes operate alongside other CAP income streams, of which the most closely related are LFA (natural handicap) payments and Article 68 environmental payments under Pillar 1. The Natura 2000 measure is not widely used in the countries studies, but a few agri-environment programmes have entry-level management packages targeted at Natura 2000 habitats and species, for example farmland birds in England and high nature value (HNV) grasslands in Bulgaria.

The reference level, payments rates and factors affecting uptake

The study examined the dynamics of the relationship between the reference level and entry-level agri-environment requirements in the case studies. The reference level includes EU and national or regional legislation, and cross-compliance standards defined at RDP level within an EU-wide framework. It is evident that in some places the reference level is changing quite frequently, even within the current programming period, necessitating changes in the associated entry-level agri-environment schemes and payment rates. Other reasons for altering agri-environment schemes may be aimed at improving environmental impact or uptake.

In the next programming period the reference level for agri-environment schemes is likely to include new 'green' payments in Pillar 1, covering several types of management action already widely used in entry-level schemes. This may require changes to some current schemes, especially those targeted at intensive arable cropping systems.

Member States have developed several variations and refinements of the payment rates for entry-level schemes within the rather simple calculation formula set by the EU Regulation (income foregone plus costs incurred and transaction costs, if justified). These differences seem to be influenced partly by previous experience of agri-environment programmes. In some cases payment rates are set at considerably less than the full net cost of the entry-level management required, and most of the case study countries did not use transaction costs for the schemes studied.

At farm level the different payment structures include payments per hectare of land managed, or for the whole farmed area; some payments are flat rate, others are degressive or capped as the area increases. There were several examples of efforts to improve environmental cost-effectiveness of entry-level schemes through targeting and differentiation of both management actions and payment rates, for example by type of farming system, soils, environmental features or geographical zones.

The relationship between payments rates and uptake seems to be quite complex and the effects are not always easily predicted. The most important factor influencing uptake of entry-level schemes appears to be farmers' perceptions of the extent to which the required management action is already in place, or can be adopted without significant disruption to the farm business. In some extensive livestock systems the additional, relatively secure agri-environment income can help to protect environmental benefits from changes driven by external economic factors such as fluctuating markets.

In one of the case studies major administrative problems have seriously affected the uptake of a well-designed new entry-level scheme, and undermined the confidence of farmers who had been anticipating much needed support for HNV grassland management.

The process of designing and revising entry-level agri-environment schemes

All the schemes studied built upon previous agri-environment experience, although the extent of this varied considerably. Where pilot schemes had been used these were seen as an opportunity to test the delivery process and farmers' reactions, not just the management actions. Scheme design was usually a negotiated process under the control of the managing authorities, involving a wide range of actors and sources of evidence, and seen as a valuable learning opportunity for those involved. National systems of feedback and review in the early stages of delivery were used to refine and adjust schemes and in some cases reference levels too.

Farmer support networks and farmers' attitudes

Effective farmer support networks can make a significant contribution to the effective delivery of entry-level agri-environment schemes, but only if the source of advice is seen by farmers as trustworthy and relevant to their broader farming operations. Relatively little use is made of advice which the farmer has to pay for, and free technical support from a range of different providers can be useful but is not consistently available in all schemes. The characteristics of effective support networks are identified and illustrated with examples from the case studies.

There is little empirical evidence on the effect of entry-level participation on farmers' environmental awareness or behaviour, and this is an area that would merit further research. Anecdotal evidence suggests that there are benefits from engaging farmers in the process of designing entry-level schemes, improving their understanding of the purposes of the schemes and providing them with feedback on environmental achievements of the schemes.

Conclusions and recommendations

This study has shown that entry-level management actions are included in the agri-environment programmes of all 88 RDPs, are applicable to all farming systems, and have the capacity to deliver multiple environmental objectives of importance at EU level. The extent to which this potential is met depends not just on the type of management actions within entry-level schemes, but how they are differentiated and targeted to meet local circumstances and, crucially, on the effective implementation by a significant proportion of farmers in the most appropriate locations. If this can be achieved, even quite small incremental increases in environmental management may have a cumulative effect at a landscape scale. These schemes also provide an opportunity to introduce farmers to the principles and practice of environmental land management.

In the context of other CAP policies, entry-level agri-environment schemes:

- provide an incentive for positive environmental management and a basis for higher-level agri-environment schemes;
- can both improve current levels of environmental management, and maintain environmentally appropriate land management that is threatened by external factors;
- should not be seen in isolation, but as part of a integrated package of support, including LFA and other RDP measures;
- can target regional environmental priorities by building upon the environmental foundation provided by the proposed Pillar 1 'greening' measures.

In the design and revision of agri-environment programmes:

- targeted and differentiated entry-level requirements and payments could incentivise uptake of environmentally beneficial management, taking advantage of available and emerging technologies to do so cost-effectively;
- guidance on transaction costs may need to be revised;
- farm advisory and support services have a critical role; one possibility would be to extend Farm Advisory Services to cover agri-environment advice;
- including agri-environment training within entry-level schemes could be of benefit;
- Involving farmers in scheme design and review processes, and providing them with feedback on environmental impacts can improve capacity building, understanding and uptake.
- small-scale pilot testing and evaluation of entry-level schemes or management actions could improve efficiency, acceptance and delivery;
- 'fast track' internal review processes during the first two years of a scheme provide an effective way of resolving problems.

1 INTRODUCTION

1.1 Framing the study

Agri-environment policy is one of the most established policy mechanisms within the Common Agricultural Policy (CAP). Originally targeted mainly at mitigating the environmental impacts of agricultural intensification, it now has a key role in addressing the Community's environmental priorities across the diversity of environmental situations, agricultural structures and types of farming in the EU-27. First introduced in 1985 as a voluntary measure for Member States, it has gradually assumed greater prominence within the CAP and since 1992 has been the only compulsory measure within rural development policy.

Agri-environment programmes are designed and implemented at Member State or regional level within the context of the 88 Rural Development Programmes (RDPs) in the EU-27, and typically include a combination of entry-level and higher level schemes, and both horizontal and zonal coverage. Agri-environment schemes do not exist in isolation, operating above an environmental baseline (reference level) and alongside other Pillar 2 payments and state aids; most farmers also receive decoupled Pillar 1 income support payments. During the course of this study the Commission published draft legislation for a significant reform of the CAP[1], including proposals for 'greening ' Pillar 1 direct payments. Some of the proposed greening elements are implemented currently as entry-level agri-environment management requirements within Pillar 2 in some Member States.

The purpose of this study is to gain a better understanding of the nature, diversity, design and operation of the entry-level elements of agri-environment schemes throughout the EU-27. To date there have been no systematic studies at EU level specifically of entry-level agri-environment schemes, nor any attempt to provide a comprehensive typology of their requirements or to examine the diversity of relationships between the reference level, basic agri-environment requirements and payments.

1.2 Defining entry-level agri-environment management

Member States and regions have taken many different approaches to implementing the agri-environment measure, reflecting amongst other factors political priorities, climatic variations, vulnerability to drought or soil erosion, characteristic farming systems and practices, habitats and features of farmland, environmental risks and priorities, and socio-cultural differences in attitudes to the environment and to the role of farmers.

The resulting diversity of agri-environment schemes (of which the entry-level components form only a part) tend to differ in the scope and ambition of the environmental objectives; the farm management required (for example, maintenance of habitats and features, or enhancement, restoration and creation); the territorial coverage of the scheme, which may be open to all farmers across the territory or targeted at particular zones, habitats or farm

[1] *The CAP towards 2020: meeting the food, natural resources and territorial challenges of the future* (COM(2010) 672 final)

types; the relative level of resources allocated; and the eligibility criteria, which include a competitive element in some Member States.

In principle, the environmental reference level in the Member State or region is the baseline that determines what can and cannot be paid for by an agri-environment scheme. Above this baseline many different types of farm-level management requirements can be defined, of which the more basic can be described as 'entry-level' and the more demanding as 'higher-level'. Member States structure their agri-environment programmes in many different ways, often with entry-level and higher-level requirements in separate schemes, but sometimes including both within the same scheme.

There is no standard EU definition of entry-level agri-environment schemes or management requirements. For this study 'entry-level' is defined as:

- management requirements that sit relatively close to the reference level;
- not requiring significant change to the system of farming and achievable by most of the target farmers by:
    - adjusting certain farming practices; or
    - continuing existing management that maintains environmental resources which might otherwise be under threat;
- targeted at the majority of land and farms within a defined area, or of a specified type;
- flat rate payments (which maybe degressive) and few associated non-productive investments;
- a relatively simple, non-competitive application process and desk-based approval process.

This study is concerned with the content, structure and design of entry-level agri-environment support, and it **does not attempt to measure or evaluate the environmental impact** of that support. The scope of the study **excludes higher-level** agri-environment management, such as the creation or restoration of landscape features and habitats, and the conservation of genetic diversity; it also **excludes organic farming** and **integrated production** because these involve changes the whole farming system.

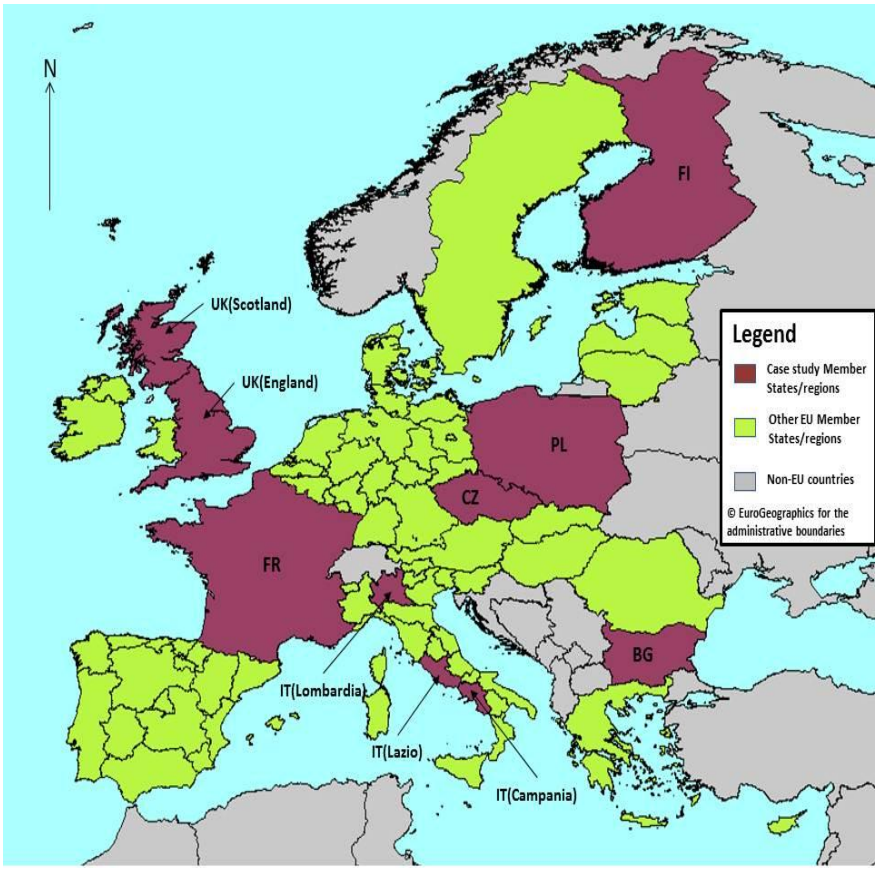
1.3 Approach to the study and structure of this report

As a first step, the study developed a typology of entry-level agri-environment management in the EU-27, based on detailed information extracted from all the 2007-13 RDPs, including those for the outermost regions. This EU-27 typology is presented and discussed in Chapter 2, followed by a comparative analysis of the different types of entry-level management actions across EU-27 and an examination of the way in which these are grouped within agri-environment schemes (Chapter 3).

The remainder of the study focusses on the design and implementation of selected entry-level agri-environment schemes in ten RDPs from seven Member States shown in Figure 1.1 (Bulgaria, the Czech Republic, Finland, France, Italy, Poland and the UK), considering first the regional environmental context within which these schemes operate (Chapter 4) then examining the dynamic relationship between the reference level, the structure of entry-level schemes, payment rates and uptake (Chapter 5). This is followed by a review of the

way in which the design, revision and improvement of entry-level elements of agri-environment schemes is approached (Chapter 6) and of the role of farmer support networks and the effect that participation in entry-level schemes has on farmers' attitudes to the environment (Chapter 7). The conclusions of the study and recommendations for design and implementation of entry-level agri-environment schemes are presented in Chapter 8.

Figure 1.1: The ten case study RDPs



2 A TYPOLOGY OF ENTRY-LEVEL AGRI-ENVIRONMENT MANAGEMENT IN THE EU-27

There is a very large range of different types of management that are included within the entry level components of agri-environment schemes in the EU-27, each of which can help deliver a number of environmental objectives. Some means of synthesising this information is needed, therefore, to facilitate a better understanding of the nature of the entry-level management that is supported in different countries, and the potential contribution of this to different environmental objectives.

A number of typologies of EU agri-environment schemes have been published in the past, but none looked specifically at the full range of entry-level management actions found in all agri-environment schemes in the EU and their associated environmental objectives. A new typology has therefore been developed for the specific purposes of this study.

This chapter describes the process of developing this typology, and uses it to examine the potential environmental contribution made by different types of entry-level management.

2.1 Purpose and development of the typology

A review of the typologies that have previously been published on EU agri-environment schemes showed that none focussed specifically on entry-level agri-environment management actions or schemes, nor did they offer a typology based on the full range of agri-environment schemes being implemented in all regions of the EU-27. Rather they tend to fall into one of two main categories. Either they focus on very small sample sizes in order to examine the design, implementation and effectiveness of specific agri-environment management actions in detail (see, for example, Bonnieux *et al,* 2006) or they focus more generally on agri-environment schemes, allowing for a general overview of their application across Member States, but lacking sufficient detail to identify the different types of management supported, and whether this is entry-level or more demanding in nature (see for example Oréade Brèche, 2005). A more detailed description of previous agri-environment typologies can be found in Annex 1.

To examine entry-level management across the EU-27 agri-environment programmes for 2007-13 and the degree to which this management has the potential to deliver different environmental objectives, a new typology was therefore required. Two types of information were needed to construct the typology - a classification of the different types of entry-level management in 88 RDPs, and the range of environmental objectives which potentially benefit from this management.

2.1.1 Identifying entry-level management actions

Information on the entry level management actions from all 88 RDPs was sourced from the most up to date versions of the RDPs available in early 2011[2], supplemented by 'scheme' literature available on the website of European Network for Rural Development[3] or from the national and regional websites of the agri-environment delivery agencies.

[2] These included revisions during 2009/2010 in response to the changes resulting from the CAP Health Check.

[3] http://enrd.ec.europa.eu/en/home-page_en.cfm

An Excel based database was created to collate the information gathered from the RDPs. This included, for each of the 88 RDPs, the agri-environment schemes, how these are presented as distinct packages or in menus, their constituent management actions and, most importantly, the detailed requirements of each management action. The database was also populated with summary information inferred from the RDPs and other sources, including the main farming system to which a scheme or type of management action is applicable and the main bio-climatic region of the Member State or region.

One of the largest challenges in extracting information was the translation of the RDP texts to ensure that the subtleties of certain types of management action were reflected accurately. In addition, although most RDPs follow a common structure, there is a high degree of variation in the way Member States or regions have approached the layout of each measure fiche. In some cases the layout was well structured with management actions in tables and clearly grouped into different schemes or sub schemes. However, in a number of cases the layout of the information followed a narrative structure, making the extraction of information more difficult.

The classification of several thousand recorded entry-level management actions into different types was done through an iterative, bottom-up process of grouping like with like, using the details of management actions recorded in the database. This was felt to be the most meaningful and objective way of categorising the range of management actions extracted from the RDPs, and preferable to the more subjective approach of simply allocating management actions to a pre-determined a list of types.

The output of this analysis was a classification of 63 different *types* of entry-level management action, which in turn were grouped into 15 broader **categories** where the types of action are similar, or share a common focus or aim. For example *limits to application of fertilisers, plant protection products* or *lime* were grouped under the category of ***input management***. Similarly, *grass cover in permanent crops* and *green or vegetative cover* on arable land were grouped under the category of ***soil cover***[4]. All the 63 types are listed in Box 2.1, in descending order of frequency of occurrence of the categories within agri-environment schemes in all 88 RDPs[5]. It must be emphasised that this is a subjective, analytical categorisation for the purposes of this study, and is not intended to represent the way in which actions are packaged and delivered within agri-environment schemes.

Box 2.1: The 63 types and 15 categories of entry-level management action in the EU-27 RDPs

[4] A number of actions were found that could not be grouped or occurred in only one RDP and have not been included in the typology or analysis. These are: fencing; improve visual appearance of farm; install bird/boxes; maintain bracken; no fences; no mineral extraction; remediation; removal of plastic waste; restricted access; vehicle use; crop management (other); grassland management (other), soil management (other); no mechanical weed control; no mulching; no ploughing-in of crops; no hunting.

[5] Frequency of occurrence simply means presence/absence within an RDP, and does not reflect how significant the category is within the RDP.

Management of grass and semi-natural forage: maintain permanent pasture; traditional management (grass); grazing regime; restriction on peat cutting; no grazing; no machinery; control of scrub or invasive species; control of burning; restricted management dates (grass); shepherding; hay making; no cutting; cutting regime; specified grass or seeding regime.
Input management: no fertiliser; limits to fertiliser or specified regimes; no plant protection products (PPP); limits to PPP or specified regimes; no lime; limits to lime or specified regimes; no growth regulator.
Management plans and record keeping: management plans (general, grazing, and input); record keeping; analysis.
Soil cover: grass cover in permanent crops; green or vegetative cover; over winter stubbles; mulching regime.
Soil management: erosion prevention strips; no tillage; tillage regime; run-off furrows; ploughing-in of crop.
Buffer strips: riparian buffer strip; non-riparian buffer strip.
Crop management: fallow; traditional management (crop); rotation with legumes; rotation; maintenance of traditional orchards; spring sown cereals; restricted management dates (crop); no burning of straw, stubble or cut residue; pruning regime; specified crop varieties and/or seeding regime; restricted management times; harvesting regime.
Landscape feature management: management of water features; management of non-aquatic landscape features.
Management for wildlife: strips or patches for wildlife; in field fallow patch for wildlife; sacrificial food crops for wildlife.
Water level management: water level management.
Non-chemical crop protection: mechanical or manual weed control; mechanical pest control; biological pest control.
Land out of production: maintain area of land out of production; take land out of production.
Apiculture: apiculture.
Irrigation management: irrigation management; no irrigation.
Training: training.

Source: Own classification based on information extracted from national and regional Rural Development Programmes 2007-2013 (versions available in early 2011).

2.1.2 Environmental objectives

Nine environmental objectives were selected against which to analyse the 63 types of entry-level management actions for the purpose of developing the typology. These are: farmland biodiversity; agricultural landscapes; water quality; water availability; soil functionality; climate change mitigation; climate change adaptation; resilience to flooding; and resilience to fire. These were derived from a combination of two different sources, the Community Strategic Guidelines for Axis 2[6] and previous studies of environmental public goods and agriculture[7].

The potential contribution that different types of management action make to the achievement of environmental objectives is often context specific and depends upon a range of factors, such as how and where the management is implemented and the level of uptake across a region or target area. Understanding the principal objective of management actions, either individually or packaged together within schemes, is not straightforward. This is partly due to the inherent multi-objectivity of the management actions themselves, but also because the objectives are not always articulated explicitly within the description of the agri-environment schemes within the RDPs, or at the required level of detail. Therefore it

[6] Council Decision of 20 February 2006 on Community strategic guidelines for rural development (programming period 2007 to 2013). Official Journal of the European Union 55/20, 20.2.2006.

[7] For example Hart *et al*, 2011a and Cooper *et al*, 2009

has not been possible within the scope of this study to infer the primary objective of each type of management action within its RDP context, but simply to assess which types of actions have the potential to contribute to which environmental objectives. This assessment was based on expert judgement, supplemented by information drawn from previous studies (for example Cooper *et al*, 2009; Hart *et al*, 2011b). For the purposes of this study a series of criteria were used to make judgements on whether the different types of agri-environment management actions had the potential to contribute to the nine environmental objectives. These criteria are set out in Table 2.1.

Table 2.1: Criteria to assess types of entry-level actions against environmental objectives

Objective	A management action is considered as contributing towards this objective if, compared to the counterfactual, it:
Farmland biodiversity	*improves* to some degree the quantity, species diversity or conservation status of the flora and fauna on the land concerned, or in adjacent water bodies
Agricultural landscapes	*maintains or protects* individual landscape elements or the characteristic structure of a more traditional agricultural landscape as a whole
Water quality	*reduces* the pressure(s) that prevent the achievement of good ecological status for surface waters or good chemical status for ground waters as defined by the Water Framework Directive (WFD)[8]
Water availability	*reduces* the demand for irrigation or *improves* the availability and timeliness of water flows to replenish surface and groundwater systems
Soil functionality	*improves* the proportion of organic matter, the level of susceptibility to erosion by wind or water, the soil's structure and capacity for infiltration, the health of its biota, or *reduces* the level or risk of contamination (after Joint Research Centre, 2009)
Climate change mitigation	*makes a contribution towards* reducing the net greenhouse gas (GHG) emissions attributable to that land and/or improving the capacity for carbon sequestration or reducing carbon emissions. The effects considered are limited to activities and biological processes within the management area and do not take into account the full life cycles of products or inputs
Climate change adaptation	*maintains or improves the opportunities* for semi-natural habitats and species to adapt their range to changing climatic conditions and/or *reduces* the pressure of agricultural externalities on natural systems so that they are more resilient to the effects of climate change
Resilience to flooding	*improves* or *increases* the capacity of land to capture and store water
Resilience to fire	*reduces* the risk of fire starting in dry or combustible vegetation and/or maintains features that act as firebreaks, reducing the risk of fire spreading

Source: own interpretation of Community Strategic Guidelines for Axis 2 and Cooper et al (2009).

Additional criteria were used to assess the *degree* of potential contribution of each type of management action to each of the nine objectives:

- **Potential direct contribution**: where the implementation of the action has the potential to contribute directly towards an objective.
- **Potential indirect contribution:** where the implementation of the action has the potential to contribute indirectly towards an objective – in other words, where the

[8] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a Framework for Community Action in the field of water policy (OJ L 327/1, 22.12.2000)

objective is not necessarily the primary focus of the action but there is clear potential for indirect contribution.

- **No potential contribution:** where the implementation of the action will make no contribution towards an objective, directly or indirectly.
- **Potentially detrimental:** where the implementation of the action has the potential to be detrimental towards an objective.

2.2 A typology of types of entry-level management actions and environmental objectives

The management actions and environmental objectives were then combined to produce the typology which explores the relationship between types of entry-level management and environmental objectives. It is structured around two axes, with the 15 categories and 63 different types of management action on one axis and the nine environmental objectives on the other, as shown in Figure 2.1. The typology is colour coded to show the potential level of contribution of each type of management action towards each of the environmental objectives.

Figure 2.1: Typology of types of entry-level agri-environment management actions and environmental objectives

KEY Potential direct contribution; Potential indirect contribution; No potential contribution; Potentially detrimental

Category of management action	Management actions	Farmland biodiversity	Agricultural landscapes	Water quality	Water availability	Soil functionality	Climate change mitigation	Climate change adaptation	Resilience to flooding	Resilience to fire
Management of grass and semi natural forage	Maintain permanent pasture	■	■	▫	▫	■	■	■	■	■
	Traditional management (grass)	■	■	▫	▫	▫	▫	■	▫	▫
	Grazing regime	■	■	■		▫	▫	■	▫	▫
	Restriction on peat cutting	■	■	■	▫	■	■	■	■	
	No grazing	■	■	▫		▫	■	■	▫	■
	No machinery	■	■	▫		■	▫	■		
	Scrub or invasive species control	■	■				■	■		■
	Control of burning	■	■	■		■	■	■		■
	Restricted management dates (grass)	■	▫	▫		■		■	▫	
	Shepherding	■	■			▫		■		▫
	Hay making	■	■					■		
	No cutting	■	■					■		■
	Cutting regime	■	▫					■		
	Specified grass or seeding regime	■	▫					■		
Input management	No fertiliser application	■	▫	■		■	■	■		
	Limits to fertiliser application or specified regimes	▫	▫	■		■	■	▫		
	No PPP	■	▫	■		■		■		
	Limits to PPP or specified regimes	■	▫	■		■		■		
	No lime application	■	▫	■		■		■		
	Limits to lime application or specified regimes	▫	▫	■		■		▫		
	No growth regulators		▫	■		■				
Management plans and record keeping	Management plan general	■	■	■	■	■	■	■	■	■
	Management plan grazing	■	■	■	■	■	■	■	■	■
	Management plan input	■	■	■	■	■	■	■	■	■
	Record keeping	■	■	■	■	■	■	■	■	■
	Analysis	■	■	■	■	■	■	■	■	■
Soil cover	Grass cover in permanent crops	■	■	■	■	■	■	■	■	
	Green or vegetative cover	■	▫	■	■	■	■	■	■	
	Over winter stubbles	■	■	■	▫	■	▫	■	▫	
	Mulching regime	▫		▫	▫	▫	▫			■
Soil management	Erosion prevention strips	▫		■	▫	■	■	▫	■	■
	No tillage	■	▫	■		■	■	■	▫	
	Tillage regime	▫	▫	■		■	▫	▫	■	
	Runoff furrows			■		■	▫		■	
	Ploughing-in of crop	▫				■	■	▫	▫	
Buffer strips	Riparian buffer strip	■	▫	■		■	■	■	■	■
	Non-riparian buffer strip	■	■			■	■	■	■	■
Crop management	Fallow	■	■	■	■	■	■	■	■	
	Traditional management (crop)	■	■	▫	▫	▫	▫	■	▫	
	Rotation with legumes	▫	▫	■		■	■	▫		
	Rotation	▫	▫	▫		▫	▫	▫		▫
	Maintenance of traditional orchards	■	■			▫	▫	■		
	Spring sown cereals	■	▫	▫		▫		■		
	Restricted management dates (crop)	■		▫		■		■	▫	
	No burning of straw, stubble or cut residue	▫				▫	■	▫		▫
	Pruning regime	■	■				▫	■		
	Specified crop varieties and/or seeding regime	■	▫					■		
	Restricted management times	■		▫				■		
	Harvesting regime	▫	▫					▫		
Landscape feature management	Management of water features	■	■	■	■	▫	▫	■	■	■
	Management of non-aquatic landscape features	■	■	▫		▫	■	■	■	
Management for wildlife	Strips or patches for wildlife	■	■	▫		■	■	■	■	
	In field fallow patch for wildlife	■	▫					■		
	Sacrificial food crops for wildlife	■						■		
Water level management	Water level management	■	■	■	■	■	▫	■	▫	▫
Non-chemical crop protection	Mechanical or manual weed control	■	▫	▫		▫		■		
	Mechanical pest control	■	▫	▫		▫		■		
	Biological pest control	■	▫	▫		▫		■		
Land out of production	Maintain area of land out of production	■	■	■	■	■	■	■	■	■
	Take land out of production	■	■	■	■	■	■	■	■	■
Apiculture	Apiculture	■	▫					■		
Irrigation management	Irrigation management	▫	▫	▫	■			▫		
	No irrigation	▫	▫	▫	■			▫		
Training	Training	■	■	■	■	■	■	■	■	■

The typology shows clearly that all types of entry-level management actions have the potential to contribute (directly or indirectly) towards multiple environmental objectives. For example, addressing water quality through more effective *input management* and the use of *buffer strips* also has the potential to contribute towards soil functionality and provide space for biodiversity. It is important again to stress that the extent to which actions have the potential to contribute towards these objectives often depends on the way in which they are implemented, where they are located and the extent of uptake in any given location.

Despite the inherent multi-objectivity of all types of entry-level actions, some have the potential to contribute towards more objectives than others. Seven of the 15 categories include at least one type of management action with the potential to contribute directly or indirectly to all nine objectives (these are the *maintenance of permanent pasture, traditional management (crops and grass)t, management of water features, water level management, fallow,* and *taking* and *maintaining land out of production*, together with the non-land-based *management plans and record keeping* and *training*). By contrast, *sacrificial crops for wildlife* has the potential to contribute towards only two of the nine objectives.

Actions which involve managing or creating areas that are not used directly for production[9] generally have the potential to contribute towards more objectives than those where environmental management is carried out in close conjunction with crop production. However, there are some notable exceptions to this. For example, the categories of *traditional management, green soil cover* and *grass cover in permanent crops* are all closely linked to production but also have the potential to contribute to almost all of the objectives. The *training* of farmers and farm workers in environmental land management has the potential to support all the objectives, although this of course depends on the scope of the training.

Those actions with the potential to contribute towards the fewest environmental objectives (only two or three) contribute mainly towards farmland biodiversity, climate change adaptation, and agricultural landscapes[10].

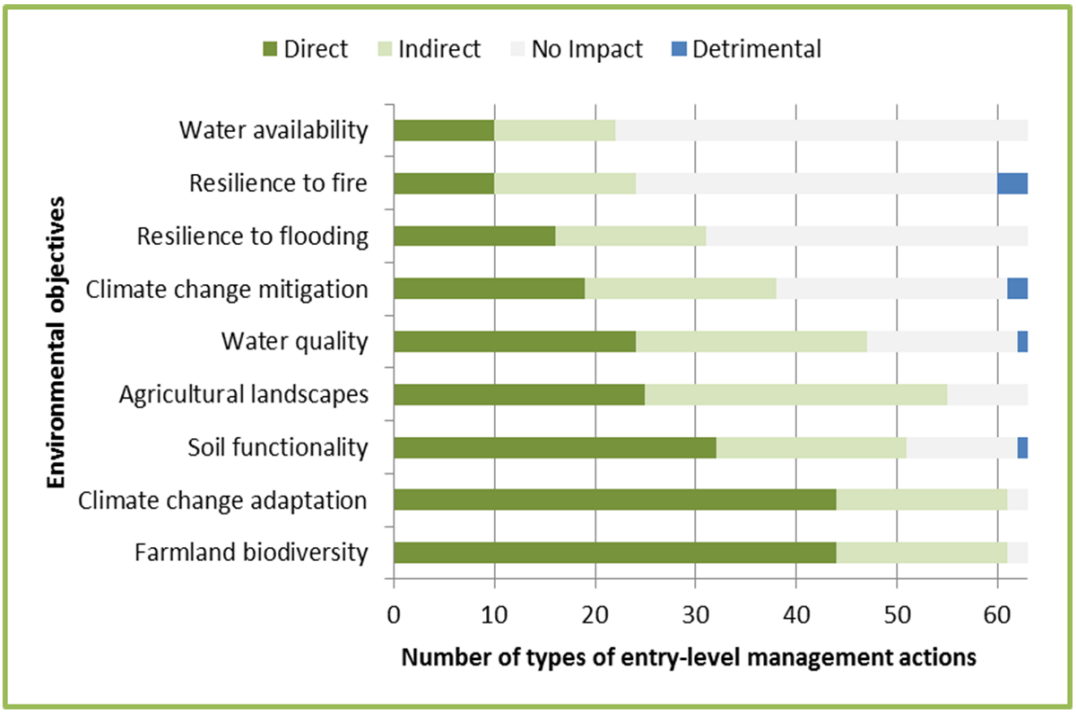
Certain environmental objectives potentially benefit from a wider range of types of entry-level management actions than others, as Figure 2.2 shows. A large proportion of all types of entry-level actions from all categories have the potential to contribute towards farmland biodiversity and climate change adaptation. This is due in part to the fact that both these

[9] Including areas that are never used for production (for example hedgerows, water features); areas that are temporarily not used for production (for example strips or patches for wildlife, fallow, land out of production); and areas which can in some cases be used for production but where conventional activities are limited (for example buffer strips).

[10] The following types of actions have the potential to contribute towards three or fewer objectives: sacrificial food crops for wildlife, hay making, no cutting, apiculture, cutting regime, specified seed regime (grass), in field fallow patches for wildlife, specified crop varieties and/or seeding regime, restricted management times (crops), no growth regulators, and harvesting regimes.

objectives are affected by a wide range of different environmental pressures and thus benefit from an equally wide range of types of management, directly or indirectly. In contrast, although soil functionality benefits from more than half of the 63 types of action, most of the direct benefits are associated with a narrower range of categories, those concerned specifically with the management of *soils, inputs, buffer strips, water, irrigation* and *land out of production*.

Figure 2.2: Number of types of entry-level management actions with the potential to contribute towards the nine environmental objectives



Fewer types of entry-level management actions (25 of the 63) have the potential to contribute directly to the agricultural landscape objective - not just those for *landscape feature management* (of ditches, hedgerows, infield trees and stone walls for example) but also actions from other categories such as *management of grass and semi-natural forage, crop management, soil cover and buffer strip* (for example *cutting, grazing,* and *pruning regimes, fallow* and *traditional management* practices). A similar number of actions but from a slightly different range of categories potentially contribute towards water quality, particularly those aimed at *input management*, *soil cover* and *soil management*. The climate change mitigation objective potentially benefits directly from just under 20 actions within several different categories, including all types of *soil cover* and *management* and *buffer strips*.

Not many of the 63 types of entry-level management actions have the potential to contribute towards resilience to flooding, and even fewer to resilience to fire. Types of actions common to both objectives include the introduction and management of *buffer strips* and *erosion prevention strips*, the *maintenance of permanent pasture* and the *management of water features* because these can improve infiltration rates or slow the spread of floodwater, and also act as firebreaks. The presence of vegetation (for example

green cover and *landscape features*) may contribute towards improving resilience to flooding, whereas limiting the growth of vegetation can reduce combustible material (for example by *scrub control* or *grazing regimes*) and may contribute towards increasing resilience to fire. Very few types of entry-level actions have the potential to contribute to water availability. Those that do include *irrigation management*, *water level management*, *green cover*, *fallow* and taking or maintaining *land out of production*.

In assessing the potential contribution of actions to objectives it is apparent that some types of entry-level management actions, if carried out in the wrong locations or implemented poorly, have the potential to be detrimental towards some environmental objectives. Only a few instances were found, with the resilience to fire being the objective most affected. The lack of grazing or cutting grass and semi-natural forage, as well as certain mulching regimes could allow the build up of combustible material, which in some circumstances might allow wildfire to spread. This is likely to be a concern only in systems and regions that are naturally subject to wildfire or in particularly arid conditions, and the risks are likely to be localised. Actions involving burning have the potential for detrimental impact on the greatest number of objectives including water quality, soil functionality, and climate change mitigation. Controlled burning of vegetation can leave soils exposed, for example vulnerable soils on heather moorland, and increase the likelihood of surface run off, but again the risks are likely to be localised. Scrub control also has the potential for detrimental impact on climate change mitigation, because removing woody vegetation may reduce capacity for carbon sequestration.

This typology uses a subjective categorisation of management actions for the purpose of analysis, but within agri-environment schemes management actions are often grouped together and presented quite differently, for example in 'packages' of multiple actions linked to a specific payment under the scheme. Such grouping of actions may enhance their potential contribution to the range of environmental objectives. Equally, the way in which actions and packages of actions are implemented and targeted can also influence the level of contribution towards different objectives.

Chapter 3 discusses in more detail the different types of entry-level management actions and the categories to which they were assigned for analysis, where they are found in different RDPs, which farming systems they apply to, and how they are packaged together within agri-environment schemes.

3 COMPARATIVE ANALYSIS OF EU-27 ENTRY-LEVEL AGRI-ENVIRONMENT MANAGEMENT ACTIONS

This section provides an overview of the distribution of the different categories of management actions identified in the typology across the EU-27 alongside an outline of the range and types of management actions found within the most commonly occurring categories. It then examines in more detail the use of specific types of management actions within agri-environment schemes in different regions and how they are combined into packages. The seven RDPs for the outermost regions are analysed and discussed separately from those for the 'continental' part of the EU.

3.1 Qualitative overview of entry-level management actions in the EU-27 RDPs

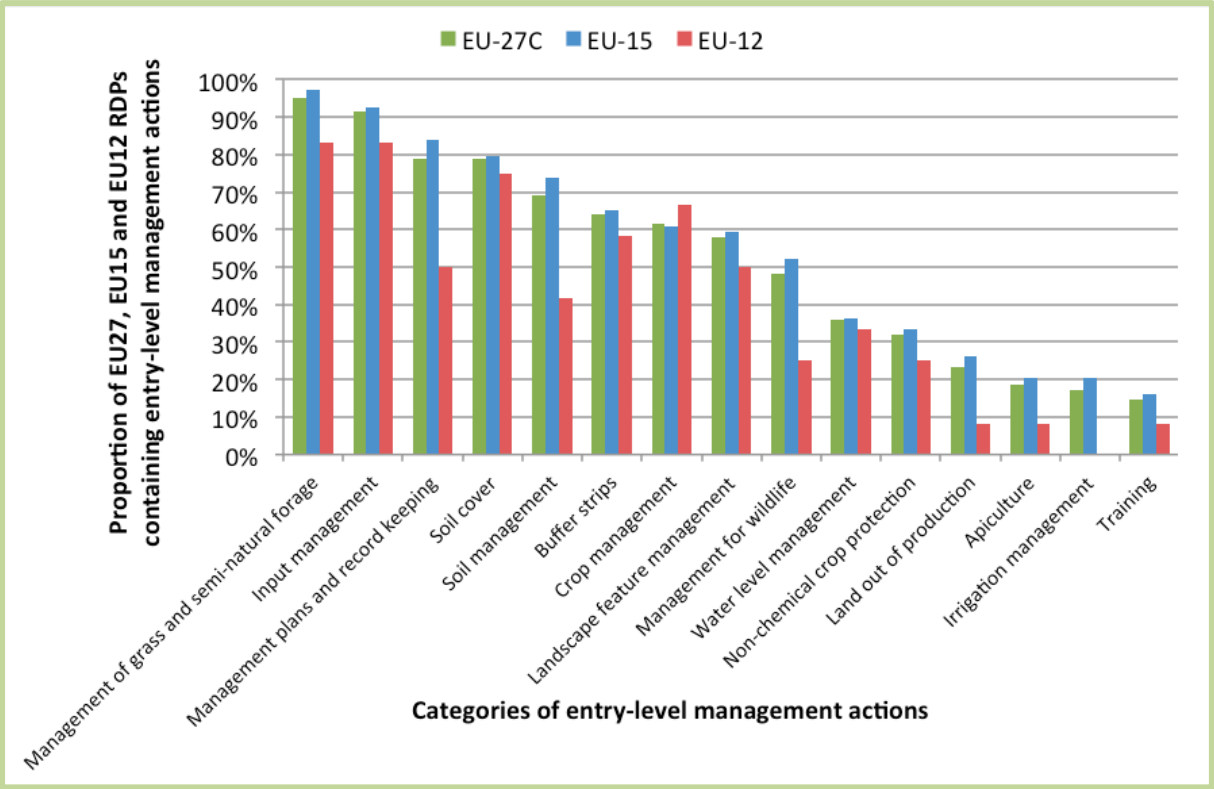
The typology in Chapter 2 covers 63 different types of entry-level management action, grouped into 15 different categories, as shown in Box 2.1 and Figure 2.1. These categories vary in character, the breadth of farming systems to which they apply, and in the number of management actions they contain.

For the 81 RDPs in continental Europe, the nine most widely represented categories of management actions are the *management of grass and semi-natural forage* (95 per cent of RDPs), *input management* (91 per cent), *management plans and record keeping* (79 per cent) *management of soil cover* (79 per cent) and soil management (69 per cent), *buffer strips* (64 per cent), *crop management* (60 per cent) and *landscape feature management* (58 per cent). Figure 3.1 shows the distribution of the different categories of management action within agri-environment schemes in continental Europe and how this differs between the EU-12 and EU-15 groups of RDPs.

The categories that are least well represented within agri-environment schemes across the EU-27 include *water level management* (38 per cent) through to *training* which is only present as an agri-environment action in a few RDPs (15 per cent), although elsewhere it may be provided under Axis 1 measures rather than integrated into agri-environment schemes.

Figure 3.1 shows that no one category of management actions occurs in every continental RDP. In the case of *management of grass and semi-natural forage*, for example, reasons for the absence of this category in an agri-environment scheme may be that the focus is primarily on the environmental management of arable land (for example in Sachsen, Germany) or because the management of grass is covered under organic or integrated production systems (for example in Navarra, Spain), which have been excluded from this study. The distributions of individual categories of management action are examined in more detail below.

Figure 3.1: Proportion of the EU-27 (continental), EU-15 and EU-12 RDPs containing each of the 15 different categories of management actions



Source: Own calculations based on the typology

All categories of action are present in both the EU-12 and EU-15 groups of RDPs, with the exception of *irrigation management*, present only in EU-15 agri-environment schemes. However there are differences between new and old Member States in terms of the proportion of RDPs in which individual categories are found. Whereas the EU-15 RDPs follow the EU-27 distribution described above, the EU-12 RDPs do not, as Figure 3.1 shows. In the new Member States the two most widely represented categories of management actions are the same as those for the EU-15 - the *management of grass and semi-natural forage* and *input management*, found in 83 per cent of EU-12 RDPs. *Management plans and record keeping* and *soil management* are not as widely represented as in the EU-15, occurring in not more than half of the EU-12 RDPs, while *crop management* is more prevalent in EU-12 than EU-15. Six other categories (*water level management, non-chemical crop protection, land out of production, apiculture, training* and *management for wildlife*) occur in no more than a third of the EU-12 RDPs.

Some RDPs contain types of actions from a smaller number of categories than others. For example in Hungary and the Abruzzo, Basilicata and Valle d'Aosta regions of Italy only six of the 15 categories of management actions are represented. These are *management of grass and semi-natural forage*, *input management, management plans and record keeping, buffer strips, crop management*, and *management for wildlife*. Whereas in the RDPs for England (UK), Flanders (Belgium), Corsica (France) and Basque Country (Spain) a much wider range of categories are found, for example 13 different categories in the case of the Basque Country.

Overall the balance of types and categories of management actions present within the RDPs appear to be largely independent of bio-climatic regions (see Table A3.1 and Figure A3.1, Annex 3). Given that the bio-climatic information is inferred, the lack of associated patterns may simply be because the resolution is too coarse to identify climatic differences that affect the choice of management actions at a local level. The only notable relationship between management actions and bioclimatic region relates to apiculture. This category has a particularly high presence in Mediterranean RDPs and is completely absent from the Boreal region. Within Mediterranean RDPs the majority of occurrences are in Spain (plus one in Corsica and one in Malta). Apiculture is also found in the Atlantic region, mainly in the north and west of Spain.

3.2 Types of management action within the broad categories

In agri-environment programmes the types of management actions identified in this study are not usually 'stand-alone' options for farmers to choose, nor are they likely to be grouped together within agri-environment schemes in the analytical categories used for the typology (the *buffer strips* and *landscape feature management* categories are exceptions). This section looks in more detail at some of the different categories of management actions found in RDPs, examining in more detail where specific types of action are used and how they are grouped together within the 81 continental RDPs (the outermost regions are considered separately, given their geographic distance from continental Europe and their different bio-climatic and farming conditions). Detailed examples of all 63 types of management actions are provided in Annex 2.

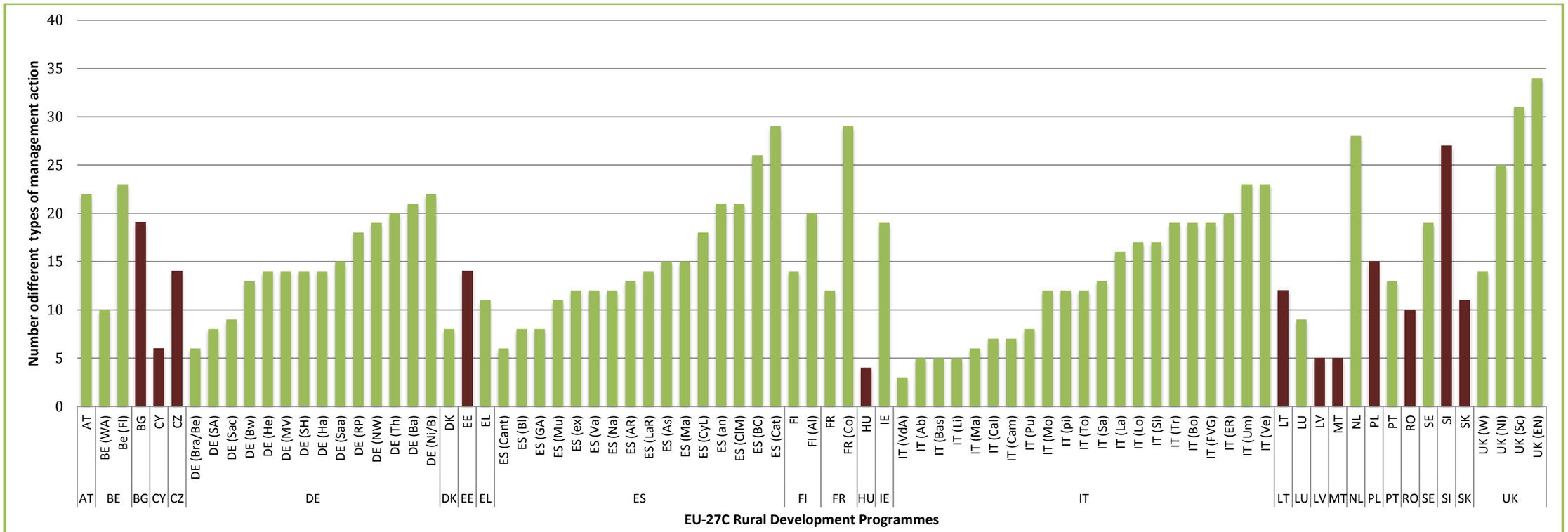
3.2.1 Management actions found within individual RDPs

Moving from the overarching categories of management actions to a consideration of the distribution of the 63 individual types of management action, it is evident that there is considerable variation in both the number and type of management actions found within agri-environment schemes in different RDPs. Fewer than five of the possible 63 different types of management action are included within agri-environment schemes in some regions[11] compared to more than 25 in others[12], with an average of 15 per RDP. Figure 3.2 shows the number of different types of management actions found within each of the 81 continental RDPs. Compared to the EU-15 RDPs, the agri-environment programmes of the EU-12 Member States contain on average fewer types of action (only three of them have 15 actions or more), although the range is striking in both groups and varies even between regions of federal Member States. This may partly reflect the extent of support for organic or integrated farming, which in some Member States (for example Italy) is a significant element of the agri-environment programme, but is not covered by this study.

[11] Hungary, Malta, Latvia, Cyprus and the Italian regions of Arbruzzo, Basilicata, Valle d'Aosta, and Liguria.

[12] Slovenia, the Netherlands, the Corsican region of France, the Catalunya, and Basque country regions of Spain; and the Scottish, English and Northern Ireland regions of the UK

Figure 3.2: Number of different types of management action within each RDP



KEY *EU-12 Member States* *EU-15 Member States*

3.2.2 Management of grass and semi-natural forage

The management of grass and semi-natural forage is the most commonly occurring category, found in 77 of the 81 RDPs[13]. It is also the category that covers most individual types of actions, 16 in total, including requirements to maintain areas of permanent pasture, upper and lower limits to grazing intensity, restrictions on burning of vegetation, as well as wildlife-friendly cutting regimes and hay making. The widespread inclusion of this category can be partly explained by the fact that it covers not just management applicable to permanent pasture and semi-natural forage areas, but also management of grass leys within arable rotations, as well as wooded pastures. This range of actions does *not* include the management of grass on specific features such as buffer strips or strips or patches for wildlife, which are covered in other categories of the typology.

Grazing regimes for livestock are the most common type of management actions within the category, closely followed by cutting regimes (73 and 58 RDPs respectively). Within agri-environment schemes of the EU-12 RDPs both are commonly found together, but their relative importance varies. For example, in the Czech Republic with very large farms and fields more emphasis is placed on mowing as a means of maintaining grass systems, but in Slovenia, with its high proportion of mountain pastures, grazing regimes feature more prominently (Annex 2). With a few exceptions, agri-environment schemes in the EU-15 RDPs, in contrast to those in the EU-12, tend to favour grazing over cutting regimes (63 compared to 46 RPDs) for the agri-environment management of grassland. Grazing regimes are not found in two RDPs (Sachsen, Germany and Navarra, Spain).

The environmental objectives of grazing regimes are not always clear from the RDPs, but the preservation of local biodiversity is the most apparent. Grazing regimes typically specify limits for stocking densities, seasons at which livestock are allowed to graze and, in some cases, define the type of livestock to be used[14]. Stocking densities may be set as an upper limit, or as a range with a lower limit also defined. Minimum densities vary from 0.1 livestock units per hectare (LU/ha) in Andalucía, Spain to 1LU/ha in Piedmont, Italy with maximum allowed densities ranging from 1LU/ha in Andalucía, Spain up to 2.5LU/ha in Hamburg, Germany (this figure is particularly high, and is just for seasonal grazing between July and November). Two livestock units per hectare is the more commonly specified maximum, present in 12 RDPs. This range is perhaps unsurprising given the different climates, soil types and seasonal variations across the EU, which means that different types of land will have different environmental carrying capacities. For the same reasons cutting regimes can have a range of requirements, including the number and orientation of cuts (such as from the centre to edge of the field), the earliest date at which mowing starts (often in mid June), how much of the parcel can be cut at any one time, the minimum height of sward to be left and the removal of the cut material.

[13] The four RDPs without any grassland management actions are mostly in the Mediterranean (Cyprus, Malta, and Navarra (Spain)) but the fourth is much further north, in eastern Germany (Sachsen)

[14] Packages and actions exclusively aimed at genetic conservation and the use of rare breeds were not included in this analysis. However, some grazing regimes do specify the type of grazing animal to be used.

Within agri-environment schemes, grazing regimes are invariably delivered as part of packages that include other actions from this category (such as maintenance of permanent pasture, scrub control, no burning) and also from other categories (for example limits to fertilisers and other inputs, to tillage and other mechanical processes that might affect soil structure). Cutting and grazing regimes may be packaged together or delivered separately, and a single RDP may have more than one package for the management of grassland and semi-natural forage.

3.2.3 Input management

The second most common category found across all RDPs and farming systems relates to input management and consists of seven actions concerned with the appropriate application, reduction, or prohibition of agrochemical and other inputs to agricultural land[15]. Alternative means of addressing issues associated with high inputs, such as the control of weeds through mechanical means are not covered here, but within the *non-chemical crop protection* category. The restriction or management of inputs on agricultural land is a commonly used group of management actions within agri-environment schemes and is applied widely across all farming systems and in both EU-12 and EU-15 RDPs. The only exception is limits to lime application, stipulated in only a few RDPS in the EU-15 (for example Sweden). There are a small number of RDPs that do not appear to contain any specific actions aimed at reducing inputs, including Hungary, Cyprus, Spain (Galicia and Navarra), and Italy (Basilicata and Marche) (Annex 2). It could be that these regions utilise other types of actions to control inputs, such as integrated or organic management (not considered as an entry-level management action for the purposes of this study) or, as is the case in Cyprus, through mechanical operations.

The two most common actions in the category are the reduction (or appropriate use) of fertilisers and plant protection products (PPPs) both of which are often found together in packages of actions (30 RDPs). Less frequently covered inputs include lime and growth regulators along with more specific elements such as copper (Slovenia). Input management actions are found together with other actions in packages designed to address a range of issues from the specific, such as wildlife management focussing on biodiversity objectives in Poland, to the more general, such as environmentally friendly management covering a range of different environmental objectives, in Luxembourg (Annex 2). In some cases the reduction of inputs is itself the aim of the package with input management combined with requirements to analyse soil samples and keep records (for example Austria).

The different levels of fertiliser inputs allowed vary significantly between RDPs, even within Member States, as do the detailed requirements surrounding their use (including the scale, type of land and dates at which they can be applied) making the comparison of maxima and minima problematic. In contrast, the level of PPP application is rarely specified, instead actions refer to the need to reduce or exclude such inputs reflecting the more varied and site-specific use of PPPs. Requirements for the method of application used also vary. For example, to help improve soil and water quality in mainland Finland an additional top-up

[15] Limits to/appropriate regimes, or the ban of fertilisers, PPPs, or lime (six actions), and the ban on growth regulators (one action).

agri-environment payment is available which requires the more accurate spreading of fertilisers on arable land, whereas in olive groves in Greece the manual application of herbicides is required.

3.2.4 Soil cover

Management actions to increase soil cover, particularly over winter months, form the third most common category of actions used within agri-environment schemes and apply to arable and permanent crop systems. Four distinct actions were identified which require varying levels of cover to soil to be provided and include green cover in permanent crops (for example Umbria, Italy), green or vegetative cover on cropped land (for example Poland), mulching regime (for example, Campania, Italy, and the retention of over winter stubbles (for example, Lithuania) (Annex 2). *Soil cover* has been distinguished from *crop management* actions for the purposes of this study because, although it takes place on cropped land, the focus is more on covering and protecting soil rather than on the management of the crop itself. However, because of this close association crop and soil management actions are often found in packages of actions together. In many cases the various forms of soil cover are packages or actions in their own right with more specific details of the management required.

The most common requirement of all these actions is a specified period of the year during which soil cover should be in place. For arable crops this is usually over the winter months starting in late September and continuing until late March early April of the following year, at which point the cover can be ploughed or removed. Where cover is required under permanent crops the implementation dates can be much longer for example in Aragón, Spain, natural vegetation under permanent crops should be maintained from 1 June to 28 February.

3.2.5 Soil management

Soil management actions are found in 56 RDPs. Five types of action are included within this category, which is aimed specifically at the management and protection of soil under arable, grassland and permanent crop systems. These are specific tillage regimes, no tillage, erosion prevention strips, run off furrows, and the requirement to plough-in crops. In contrast to the inclusion of such actions in a large number of agri-environment schemes within the EU-15, they are not widely represented in the EU-12 being absent from seven of these RDPs.

The most widely represented actions in this category relate to no tillage (25 RDPs) or specific tillage regimes (40 RDPs). Tillage regime is used here to describe a range of actions where the management interacts with soil structure, for example ploughing, direct drilling of crops and rolling. Given the variety of different tillage regimes that can be used, the way in which these actions are implemented differs considerably in different regions. Common examples include the requirement to plough along the contour of sloping land in Murcia, Spain, or limits to cultivation depth in England (Annex 2). The prohibition of tillage under the 'no tillage' action is often found in conjunction with the management of grass and semi-natural forage where certain temporary grasslands may not be ploughed between certain dates, for example for the protection of birds in Poland (Annex 2).

3.2.6 Buffer strips

Buffer strips is a category of two types of management action and is found in 52 RDPs, predominantly on arable land, and evenly distributed between the EU-12 and EU-15. Buffer strips is can limit the damaging effects of nutrient run-off and soil erosion on neighbouring habitats or features, and also help to protect biodiversity resources. A clear distinction is made between riparian buffer strips for aquatic features such as natural watercourses or ditches, and non-riparian buffer strips for features such as hedgerows. This category does not include the creation of *strips or patches for wildlife,* whose main purpose is to provide biodiversity benefits and which are often sown with specific types of plants to attract particular species, and where the restrictions on management go beyond that needed for protection from fertilisers and pesticides.

The absence of buffer strips in certain RDPs[16] could be due to several reasons, for example the use of alternative actions to reduce nutrient and PPP leaching and spreading (for example limiting or prohibiting inputs), and will depend on the Member State or region concerned. In addition, there may be other reasons for their absence, for example where requirements for buffer strips are part of the reference level.

Buffer strips are commonly found grouped in packages with actions related to soil and water protection (such as in Greece). Different types of buffer strip may be grouped together in packages entirely focussed on buffer strips (such as in Wallonia, Belgium), or may form part of a wider package of actions (such as in Estonia) (Annex 2). The required width of buffer strips varies considerably between regions, with minimum widths ranging from 0.5m in Greece to 10m in Denmark, and maximum widths from 20m in Denmark up to 60m in Sweden. The most common range is between two and 10 metres.

3.2.7 Crop management

Twelve different types of actions have been identified that relate specifically to *crop management.* They are applicable to cropped land, including permanent crops, and include specified rotations (including the use of legumes and fallow), harvesting restrictions and pruning regimes (permanent crops). *Soil management* and *input management* are not included within this category as they can also refer to grassland and have been identified as separate categories.

Crop management actions are found widely within agri-environment schemes (50 RDPs) both across the EU-12 (8 RDPs) and the EU-15 (42 RDPs). Despite this wide coverage their occurrence can vary within Member States, for example only six of the 21 Italian RDPs include crop management actions, although this may be explained by the inclusion in these RDPs of integrated production (not covered by this study) or other categories of management such as *soil cover* (for example winter stubbles, green cover), *soil management* (for example mulching or run off furrows) and *input management* actions. The most common action in the crop management category relates to crop rotations, found in

[16] Bulgaria, Cyprus, Hungary, Slovenia, Austria, Germany (Brandenburg and Berlin, Baden Württemberg, Hamburg, Rhineland Pfalz, Sachsen-Anhalt, Saarland, Schleswig Holstein), Spain (Andalucía, Astoria, Balearic Islands, Cantabria, Castilla y Leon, Extremadura, Galicia), France, Italy (Abruzzo, Calabria, Campania, Liguria, Marche, Puglia, Valle d'Aosta), and the Netherlands.

agri-environment schemes in 27 RDPs. Commonly the requirement is for between three and five crop types in the rotation but this can range from two (for example Portugal) to six (for example Thüringen, Germany) (Annex 2). Rotations are most commonly required for cereal crops, for example in Bavaria, Germany, but can also apply to vegetable crops such as potatoes in Cyprus. A separate action identified in 17 RDPs requires the inclusion of legumes within crop rotations, often requiring a minimum area to be covered. However the areas quoted do not always use comparable types of land for example five per cent of the rotated area (Bavaria, Germany) to 10 per cent of the cultivated area (Andalucía, Spain). Both types of crop rotation are found in packages with other types of management particularly soil management, input management, and soil cover, although some packages focus exclusively on establishing or maintaining diverse crop rotations for example in Bavaria and Thüringen, Germany (Annex 2).

3.2.8 Landscape Feature Management

Actions aimed specifically at the protection and maintenance of landscape features, occur in more than half (47) of all continental EU RDPs and are relevant to all farming systems. Their distribution is equally widespread across new and old Member States (six and 41 RDPs respectively). In most cases the RDPs make a clear distinction between actions that focus on aquatic features, for example ditches and small ponds, and those which focus on non-aquatic features such as stonewalls, hedgerows, or isolated trees. Of the two types, the latter are found in more RDPs, 45 in comparison to 26 for aquatic features.

These actions are delivered, either in packages focussed entirely on the management of landscape features (for example Wallonia (Belgium) and Latvia) or as part of a package of which has a broader range of objectives and includes other types of management action such as grazing densities on grassland, limits to fertiliser application and restrictions on tillage (for example Austria and Slovenia) (Annex 2).

In managing landscape features the farmer may be required to carry out management between certain dates, in keeping with the style traditional to the local landscape, perform pruning and thinning, limit or refrain from the use of PPPs and fertilisers, or simply 'maintain' the features present on the holding. The range of requirements varies between RDPs and by the type of feature being managed, however there are some commonalities. For example it is common to find restrictions on pruning or cutting hedgerows during the bird breeding period of late spring and early summer (Annex 2).

3.2.9 Management for wildlife

This category includes three types of management actions found predominantly in arable farming systems and aimed specifically at providing food, nesting, and breeding areas for wildlife. Present in agri-environment schemes in just under half of all RDPs, they occur predominantly in EU-15 with only three occurrences in EU-12[17]. This may reflect the longer history of agri-environment development in the old Member States. The category excludes other actions that also may benefit wildlife but which fall within other categories, such as *restricted management dates* or *cutting regimes*.

[17] Bulgaria, Czech Republic, Lithuania

Management actions for wildlife commonly occur only on small areas of the overall holding, but the size of area over which the specified management is required varies between RDPs. For example where strips of land are managed for wildlife, usually at the edge of a field, they range between a minimum of six metres wide (for example in England, UK) and a maximum of 30 metres (such as in Flanders, Belgium). Some strips are required within the field rather than at the field edge, such as beetle banks in England, and can be as narrow as two metres in width. In some cases, for example in Austria, a minimum proportion of the holding must be managed for wildlife as opposed to a minimum width of strip.

Although these management actions also appear in packages of measures in different regions, there do not appear to be any particular trends in the types of actions that they are associated with. As with buffer strips, these actions can be the focus of a package in their own right. In such cases, they are clearly targeted at delivering biodiversity objectives and in some cases directed at specific species, for example Skylarks (*Alauda arvensis)* in England or more generically at taxa as a whole, such as flowering plants and invertebrates in Mecklenburg Vorpommern, Germany (Annex 2).

3.2.10 Land out of production

The category of land out of production covers two actions that require a significant area of land either to be *taken* or *maintained* out of production for a significant period of time, usually longer than one year, but typically between two and five years. This is one of the categories that is least represented within agri-environment schemes, appearing without any significant pattern in only 19 RDPs, all of which are in the EU-15[18], with the exception of Bulgaria. This category does not include actions for taking smaller areas of land out of production, for example *strips or patches for wildlife*, or rotational *fallow*, as these are covered in the *management for wildlife* and *crop management* categories respectively.

Farmers are usually restricted from carrying out certain operations on land taken or maintained out of production. These vary, for example in Greece farmers are required to carry out no agricultural practices, whereas in Toscana (Italy) the farmer can mow once in spring and again during the summer but cannot use fertilisers or PPPs, or graze or work the land. In Bulgaria the area out of production must be continuous (non-fragmented) and must have a one metre wide strip around perimeter that should be ploughed two or three times a year (but not between March and July) to prevent spread of weeds into adjacent crops. In some cases certain practices are voluntary, for example in Castilla y León (Spain), farmers can use 50 per cent of the land out of production to plant a legume seed mixture for the purposes of providing food for birds. These legumes cannot be harvested but can be ploughed back in to help improve soil functionality.

Actions within this category are found predominantly in arable and grassland systems although there are instances where they are used in permanent crop systems. For example, in order to improve soil health (functionality) in wine growing areas in Austria, farmers are

[18] Austria, Germany (Bavaria, Niedersachsen and Bremen, Rhineland Pfalz, Saarland), Greece, Spain (Basque Country, Castilla la Mancha, Castilla y León, Navarra), France, Ireland, Italy (Emilia Romagna, Toscana, Umbria, Venetto) and UK (Wales).

required to remove vines from the area but must maintain green cover on the remaining land all year round. Taking or maintaining land out of production is commonly carried out to improve soil functionality, water quality (for example Greece) or to benefit biodiversity (for example Bulgaria) (Annex 2). The packages in which these types of actions are found can also include (but not necessarily on the same area of land) reduced or no fertiliser application, creation of buffer strips, cutting regimes and crop rotations.

The area of land to be taken or maintained out of production is difficult to compare between RDPs as this is sometimes quoted as a percentage of the holding or cropped area and sometimes in hectares. Where comparable values exist it is common for RDPs to require between three and ten per cent of the holding to be taken or maintained out of production. However these proportions do vary considerably, from a minimum of two per cent of the farm[19] in Ireland, to a minimum of 25 per cent in Greece. The figure quoted for Greece is particularly high and refers specifically to irrigable land in sensitive areas for nitrates[20].

3.2.11 Training

Beyond the land management activities found in agri-environment schemes, some schemes also require the farmer to attend training and education courses to help with implementation and understanding of the environmental management required. Provision for training is more usually supported under Axis 1, and this is not a commonly used category of agri-environment action, found in only 12 RDPs[21]. Only one of these is in the EU-12 (Slovenia), which has 14 packages containing this action.

Training within agri-environment schemes can be related to any or all of the environmental objectives of the scheme. It always forms part of a wider package of actions and is found, for example within packages addressing water pollution, management for wildlife and crop rotations, or it may provide a more general introduction to environmental management. In Ireland training is a compulsory requirement that must be carried out along with 11 other compulsory packages of actions (Annex 2).

Beyond the number of hours that must be spent in training, details of what the training will entail are not made explicit within the description of the agri-environment schemes in the RDPs, although this can be inferred from the focus of the other actions included within the package. The commitment to training ranges from an average of two hours a year in Luxembourg (during the first three years of a five year agreement) to four hours a year in Slovenia (20 hours over the five year agreement) (Annex 2). In some cases, for example Ireland, the link between the requirement for training and the provision for its financing under Axis 1 is highlighted, although this is not the norm.

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[19] In the case of tillage (arable) farmers or three per cent of the farm in the case of grassland farmers.

[20] The requirement on farmers is to take out of production a minimum of 25 per cent of potentially irrigable land and carry out no farming operations for the duration of the agreement.

[21] Finland, France (Corsica), Germany (Niedersachsen and Bremen and Nordrhein-Westfalen), Ireland, Italy (Bolzano), Luxembourg, Slovenia, Spain (Extremadura, Catalunya, and Navarra), and the UK (Northern Ireland)

3.3 How management actions are packaged within agri-environment programmes

Having considered the different categories of entry-level management actions included within agri-environment schemes across the 81 continental RDPs this section examines how entry-level management actions are combined within different agri-environment schemes, and how these combinations are used.

3.3.1 Grouping of actions

Although entry-level management actions have been identified and discussed individually for the purposes of analysis in this study, in reality they are commonly presented within agri-environment schemes in groups or packages of actions. The way in which actions are grouped together differs considerably between Member States and regions in terms of the number and purpose of different packages, the range and number of different types of management actions and the terminology used[22,23]. More detail on how schemes are structured and implemented can be found in Chapter 5.

Two broad types of package can be identified:

- **Thematic packages** designed to address specific issues such as the prevention of soil erosion or the management of particular environmental features such as traditional field boundaries. For example, in Åland (Finland), a thematic package of actions aimed at reducing fertilisation rates requires the farmer to limit the level of nitrogen fertiliser and manure applied to the land, keep records of different practices and establish an input management plan.
- **General packages** designed to address a number of different issues such as 'environmentally friendly management' where the individual management actions may be implemented in different locations across the farm in order to achieve these aims. For example, in Austria, a general package of actions aimed at the 'environmentally-friendly management of arable land' requires the farmer to limit fertiliser application, use crop rotations, implement strips or patches for wildlife on at least two per cent of the area, maintain landscape features, and keep records.

The way in which actions are packaged together not only affects their potential to deliver against certain objectives but also the relative level of investment (time and/or effort) required by the farmer. For example a package that contains only three actions carried out in the same location may require less effort than a package that contains six actions which must be carried out in different locations across the holding.

In some cases entry-level management actions are grouped together in packages with higher-level actions. For example in Andalucía, under the basic commitments for the sustainable management of *dehesas*, tree planting (considered in this study to be higher-level management) is included alongside actions relating to grazing regimes, restrictions on PPP use, scrub control, the establishment of a management plan and keeping records. Entry-level management actions are also sometimes conditional elements of higher-level management such as in England (UK) where participation in the entry--level agri-

[22] In RDPs groupings may be called schemes, sub-schemes or packages, sometimes with a descriptive title that signals the aims. We have chosen to use packaging as a consistent term.

[23] There are also differences in payment structure that are examined for the case study RDPs in Chapter 5.

environment scheme is almost invariably a condition of applying for the higher-level scheme.

In a few cases, entry-level management actions are not packaged together in separate schemes but instead are presented as a menu from which the farmer can choose (Box 3.1). The choice of actions for an individual farm may be influenced by advice and scheme guidance.

Box 3.1: Example of the menu based approach used in England, UK

A menu of individual actions is used in England's agri-environment sub scheme Entry Level Stewardship (ELS). Under ELS, a wide range of different management actions are available for a farmer to choose, from the creation of infield patches for wildlife to the maintenance of hedgerows or the provision of over-winter stubbles. Although such actions are not packaged together they are presented thematically whereby similar actions are listed together. This design, in combination with a significant amount of scheme literature, is intended to help farmers choose actions that are most environmentally suitable for their specific situation but it does not restrict their final choice, which simply has to meet a points threshold. All management actions are allocated a certain level of points per hectare and the farmer must choose a combination of actions to meet their total points threshold, which is linked to the area of the holding).

3.3.2 Degree of choice available to farmers

In addition to the difference in structure and targeting of packages, the degree of choice available to the farmer also differs in terms of which packages or groups of packages they are permitted to select from a scheme or programme, as well as the choice of actions within a package. At the scheme or programme level farmers may have a completely free choice of packages, may have a free choice but with restrictions where certain combinations of packages are required or not allowed, or there may be a requirement to implement a certain type or number of packages, but beyond that the farmer can choose. These variations are discussed in more detail in the case studies.

Box 3.2: Example of compulsory and optional packages used in Italy

In the Lazio region of Italy, certain package of actions can be carried out individually, whilst others must be done in combination with other packages. Under the scheme to preserve and enhance organic matter there are three packages of actions: (1) organic fertiliser; (2) catch crops and green manure; and (3) crop rotation. Packages 1 and 3 can be carried out individually whereas package 2 must be combined with either package 1 or 3. Under a different sub-scheme within the agri-environment programme (Improving the environment and conservation of the countryside) there are six different packages of actions that can be implemented individually or together. However there is a maximum remuneration (varying by crop type) that will be paid irrespective of the number of packages adopted. A similar approach is also seen in other regions of Italy for example in Emilia Romagna, and Bolzano.

Once the farmer has chosen a package of management actions, in most cases all actions in a package are obligatory, as a condition of payment, but there are some RDPs where farmers are offered a choice of actions within the package. This may simply be matching the specific

type of crop, soil or feature on the farm to the appropriate actions, or it may be an opportunity for the farmer to exercise personal preference (Box 3.2).

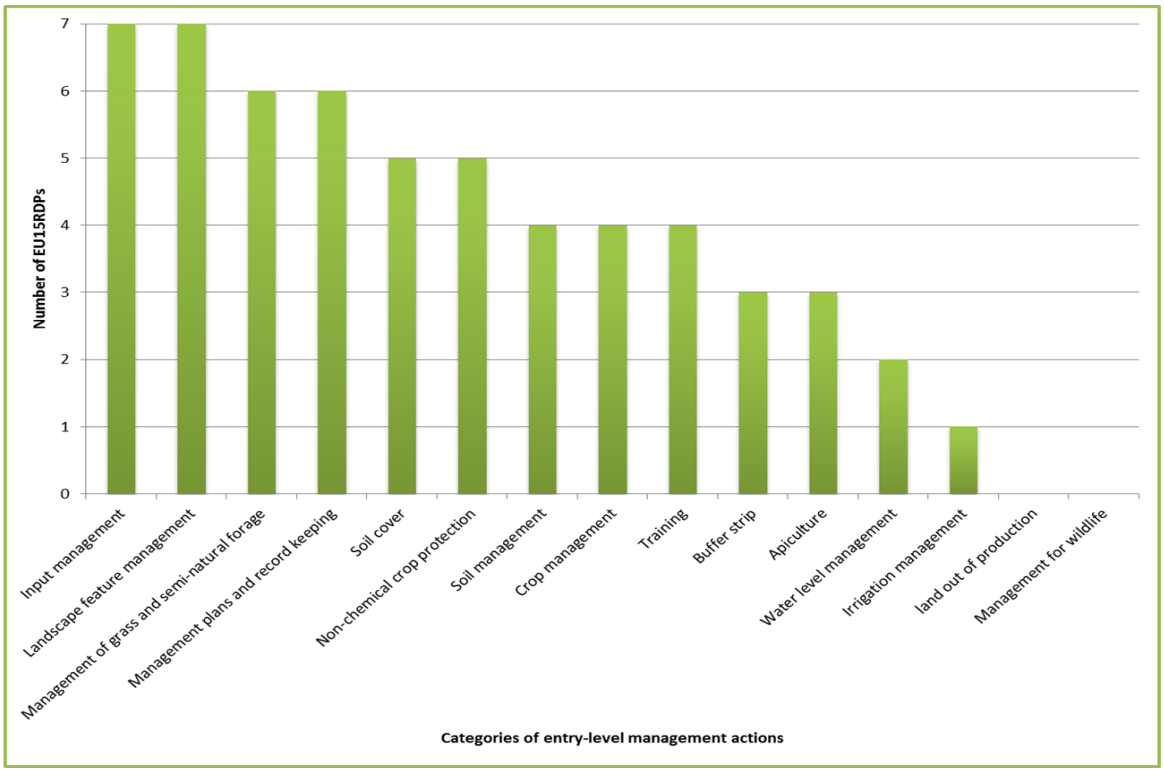
In some cases compulsory packages include optional 'top-up-actions' that may be entry-level or may be at a higher-level. Examples of top-ups can be seen in Estonia's environmentally friendly practices scheme (Annex 2) where a number of core actions must be implemented for a flat rate payment but other optional actions can be implemented for an increased payment. A similar example is also seen in Finland (Chapter 4).

3.4 Management actions in the RDPs for the outermost regions of the EU

There are nine outermost regions of the EU (see Box A3.1, Annex 3) only seven of which have RDPs. No previous typologies of agri-environment schemes have included them but it is interesting to examine the similarities and differences between these seven RDPs and those of continental Europe.

Understandably, fewer of the 63 types of management action are represented in this small group of RDPs, a consequence of the very different farming systems that occur in these areas compared with those of continental Europe. Unlike the continental RDPs, these outermost RDPs span a more diverse range of bio-climatic regions including the Caribbean (Guadeloupe and Martinique), African (Reunion), Micronesian (Azores, Madeira and Canaries), and South American (Guiana).

Figure 3.3: Categories of entry-level management actions in the seven RDPs for the outermost regions of the EU



Despite the relatively few types of actions present, 13 of the 15 broad categories of actions are represented in some way (Figure 3.3). Two categories, *input management* and

landscape feature management, are common to all of the agri-environment schemes within these RDPs. These are also two of the more common categories of actions in the continental RDPs. The categories that are not represented within agri-environment schemes in the outermost regions are *management for wildlife,* which given the very different nature of the faunal and floral composition of these regions may not be appropriate or necessary, and maintaining or taking *land out of production*.

The management actions tend to have rather different requirements from those in continental agri-environment schemes. For example, grazing regimes have marginally higher maximum livestock densities than mainland Europe, between two and three LU/ha in Guadeloupe, Réunion and French Guiana, but in the Azores and the Canaries the maximum livestock density is generally much lower (1.4 LU/ha) although it may be up to 2LU/ha in areas receiving particularly high rainfall (80 cm per year). This highlights the dependency of carrying capacities on local bio-geographical characteristics.

Interestingly, training features more frequently within these agri-environment schemes, present in all three French outer regions (French Guiana, Guadeloupe, Réunion and Martinique), despite not being included in the agri-environment scheme for mainland France.

Although the RDPs for these regions are based on a common European framework, it is interesting to see the differences in crop types reflected in the agri-environment requirements. For example, specified rotations in Reunion include pineapples, and soil cover in Guadeloupe is part of a package of actions to help improve the environmentally friendly farming associated with banana production.

4 INTRODUCTION TO CASE STUDIES OF ENTRY-LEVEL AGRI-ENVIRONMENT SCHEMES IN SEVEN MEMBER STATES

The typology and analysis in Chapters 2 and 3 illustrate the range of entry-level management actions included within agri-environment schemes in the EU-27 RDPs and their potential contribution to key environmental objectives of EU concern. The chapters that follow examine in more detail selected entry-level components of agri-environment schemes from ten RDPs across seven Member States (Bulgaria, Czech Republic, Finland, France, Italy, Poland and the UK). These were chosen to represent a diversity of farm structures, environmental problems and opportunities, bio-physical and policy contexts, and include both old (EU-15) and new (EU-12) Member States. For the latter agri-environment implementation is relatively new and their farming sector is still in the process of phasing in other CAP policies.

The information for the case studies has been derived from the most recent versions of the RDPs (available in early 2011), environmental and agricultural information from non-RDP sources, interviews with key experts, and relevant national literature.

4.1 The environmental focus of the case study entry-level schemes and their coherence with regional environmental priorities

The environmental priorities addressed by agri-environment schemes will of course differ from one RDP to another, but it should be possible to identify a clear link between EU and territorial environmental priorities and the design and focus of entry-level schemes. The extent to which these links were clear varied considerably in the seven case study countries.

One common theme was the use of agri-environment schemes to improve the protection and management of soils and the reduction of diffuse pollution, with a particular focus on Nitrate Vulnerable Zones (NVZs). In Bulgaria the Biodiversity Action Plan (BAP) highlights the problem of environmental pollution related to intensive agricultural activities, which have led to high levels of nitrates in ground and surface waters. The crop rotation scheme contributes to water quality improvement by reducing the risk of soil erosion and nitrate leaching from arable land, with priority given to applicants within the NVZs (68 per cent of the agricultural land). The scheme to control soil erosion in Bulgaria operates within the context of a risk of water or wind erosion on 24 per cent of agricultural land. In the Czech Republic arable farming in fertile areas (usually lowlands) is rather intensive both in terms of machinery and input use and there are few landscape features for wildlife. Soil erosion is a significant problem, mostly by water but also by wind in some regions, with a significant area of arable land on slopes at severe risk of water erosion. Most Czech farms are mixed, and the conversion to grassland of areas of arable land particularly susceptible to erosion has been supported by public funding since the mid 1990s. By 2006 there had been an increase of 150,000 ha in the area of grassland over the whole territory, and this erosion control scheme continues to be a priority within the current agri-environment programme[24]. In Poland soil erosion is a significant risk in some areas and more than half

[24] The current scheme in the Czech Republic is targeted at those parts of land parcels at greatest risk of erosion and includes grassland creation in riparian zones, and it is considered within this study as an entry-level management action.

the arable land has reduced levels of soil organic matter. The quality of surface and ground water is rather poor, and reducing pollution from agricultural sources and improving rural sanitation is a priority. In the UK resource protection issues have recently become more prominent within the policy agenda, and several new options for soil and water conservation have been introduced in England since 2005.

In Finland the agri-environment programme plays a central role in national environmental and conservation policy and provides the major source of funding for the protection of surface and marine waters from agricultural run-off. This is a key environmental priority because the Baltic Sea is an enclosed sea basin with poor water exchange, and inland waters in Finland are mostly oligotrophic (nutrient poor) and very susceptible to damage from pollution. There is a demanding government target to reduce pollution loads from agricultural run-off over a ten year period[25] and the national agri-environment programme is the main tool identified to achieve this, with the entry-level element of the basic agri-environment scheme focused on water protection, targeting broad non-point sources of agricultural run-off. The related higher-level options are used to address localised sources of pollution and specific locations (such as land near water bodies).

Entry-level agri-environment schemes in Bulgaria have a strong biodiversity focus, and this objective is addressed through both entry-level and higher-level schemes in the Czech Republic, Poland and the UK. In Finland, biodiversity conservation objectives are covered mainly by the higher-level schemes (with the exception of a recently introduced compulsory 'environmental fallow' requirement within the entry level scheme). In Bulgaria the three entry-level elements focussed specifically on HNV farmland and traditional farming systems reflect both the current extent of these land uses and their importance in delivering government objectives for nature conservation and protection of existing environmental assets. The BAP 2005-2010 identifies a range of issues and priorities linked to agriculture, which include the problem of abandonment of traditional agricultural activities (livestock breeding) in mountain and semi-mountain areas, leading to loss of habitats and biodiversity.

Poland is rich in biodiversity, with a large range of habitats and a mosaic agricultural landscape structure, and the protection of habitats and traditional rural landscapes relies upon extensive farming. About 45 different types of semi-natural grasslands are managed as meadows and pastures, mostly in the lowlands in depressions and river valleys, and 10.5 per cent of agricultural land retains semi-natural characteristics. Linked to this, the agri-environment priority for protecting biodiversity in rural areas in Poland is focussed on maintaining existing natural resources in good condition and avoiding the environmental effects of intensification or abandonment of agricultural land, rather than being focussed on extensification of agricultural production.

[25] In 2006 the Finnish Government made a decision-in-principle setting out Water Protection Policy Outlines to 2015. The most important objective is to reduce nutrient pollution. A target has been set to reduce agricultural nutrient loads by at least a third of their average level over the years 2001 - 2005 by 2015. Furthermore, the EU Water Framework Directive and the national Act for Arrangement of Water Management require that the condition of surface water and groundwater shall not be allowed to decline and the status of these waters should at least be good.

In England (UK) the entry-level component of the agri-environment scheme is seen as the primary vehicle for addressing specific objectives for biodiversity conservation in the wider countryside, while the higher-level scheme is focussed on more localised biodiversity priorities. At entry-level there is a particular emphasis on farmland birds which have for some years been the subject of a UK Government biodiversity indicator and annual monitoring[26]. This indicator tracks the population levels of widely distributed birds that are largely dependent on farmland habitats, and has shown substantial declines in 'specialist' farmland species. Another long-standing focus of agri-environment policy in the UK has been the conservation of traditional field boundaries, mainly hedges and stone walls, for their contribution to landscape and cultural objectives, with entry level management focussing on the maintenance of such features in good condition. The agri-environment options in Scotland appear to address mainly biodiversity and landscape objectives, with no obvious targeting of historic features, resource protection, access, climate change, or flood risk objectives as in the England scheme.

The agri-environment programme in France is relevant to the implementation of several of the BAPs adopted in 2004. For example, those for agriculture and natural heritage aim *inter alia* to protect and improve biodiversity in rural areas through a territorial approach to the improvement of agricultural practices, the use of local and traditional crops and breeds and the creation of a green/blue ecological infrastructure in agricultural areas. In the case of Italy, the coherence between environmental priorities and entry-level type management in the three regional RDPs studied here appears to be less clear than in other Member States, perhaps because there is a strong emphasis on support for organic farming and integrated production.

4.2 Structure of the agri-environment programmes in the case study Member States

In most cases the entry-level actions examined in this study lie within an overall agri-environment framework that includes both other entry-level actions and higher–level actions, but the architecture and complexity of the schemes vary considerably, as does the way in which entry-level actions are focussed on single or multiple objectives and are subsequently packaged, targeted and delivered.

The type of entry-level schemes or management actions in the seven Member States selected for more detailed study are summarised in Table 4.1 and the structure and content of the agri-environment programmes from which these examples are drawn is described in the Member State summaries below. Information is provided on target uptake where this is available at the level of detail required. However, in many RDPs the target uptake is expressed for the whole agri-environment programme, not individual packages of actions, or is quantified in terms of land contributing to specific objectives where the support is delivered by a combination of agri-environment management actions with multiple objectives.

[26] http://archive.defra.gov.uk/evidence/statistics/environment/wildlife/kf/wdkf03.htm (accessed 17 June 2011)

Table 4.1: Agri-environment schemes and management actions selected for further study

case study	Bulgaria	Czech Republic	Finland	France	Italy	Poland	United Kingdom
entry-level agri-environment scheme structure							
	separate schemes	separate schemes	standard package of 6 compulsory actions	separate schemes	separate schemes	separate schemes	self-selected package (England); separate schemes (Scotland)
national or regional RDPs selected for study	national	national	national	national	3 regions out of 21: Lazio, Lombardia and Campania)	national	2 regions out of 4: England (En) and Scotland (Sc)
payment rates €/ha for entry-level schemes selected for study	27 to 155 per ha	75 to 374 per ha managed	93 or 107 whole farm, plus 170 or 300 for area managed as 'set-aside'	32 to 76 per ha managed, total payment per farm capped	48 to 450 per ha managed, some payments reduced for larger areas	84 to 573 per ha managed, payments degressive with farm size	38 whole farm (En); 2 to 592 for area managed, total per farm capped by farm size (Sc) [27]
types of agri-environment management actions in schemes selected for study							
grassland management	*	*		*	*	*	*
semi-natural forage management	*					*	*
crop rotation	*			*	*	*	
buffer strips	*	*	*			*	*
management plans			*		*		*
fertilisers and PPP(crops)			*	*	*	*	
landscape features			*	*			*
taking land out of production			*				*
soil management					*		
soil cover	*	*			*	*	

[27] Payment data for the UK throughout the report have been converted from GBP, using a notional exchange rate of £1=1.25 euros (as used in Annexes to 2007-13 RDP for England)

4.2.1 Czech Republic

Entry-level actions reviewed: *management of meadows and pastures:* and two sub-schemes targeted at soil protection, *conversion of arable to grassland* and *cover crops.*

The Czech agri-environment programme is structured around three themes. The environmentally friendly farming theme is entirely entry-level but the other two, for grassland management and arable management, include both entry-level and higher-level elements, as shown in Table 4.2, with the entry-level components selected for further study indicated by shading.

Table 4.2: Agri-environment schemes in the Czech Republic

Level	Scheme		Target
	A	Environmentally friendly farming methods	310,000 ha of 3,515,000 ha
	A1	Organic farming	283,100 ha of 3,209,898 ha
	A2	Integrated farming	26,900 ha of 305,102 ha
Entry level	B	Grassland maintenance	
	B1	Meadows	
	B7	Pastures	
Higher level	B2	Mesophilic and hygrophilic meadows (12 options of management)	
	B3	Mountain and xerophilous meadows (12 options of management)	
	B4	Permanently waterlogged and peatland meadows (four options, nationwide but geographically targeted)	680,000 ha of 900,000 ha
	B5	Bird habitats on grassland – wader nesting site (designated)	
	B6	Bird habitats on grassland – corncrake nesting site (designated)	
	B8	Species rich pastures	
	B9	Dry steppe grasslands and heathlands (four options)	
Entry-level	C	Arable management for resource protection and biodiversity	
	C1	Conversion of arable to grassland (4 options)	300,000 ha of 2,600,000 ha
	C2	Cover crops	
Higher-level	C3	Wildlife strips	

Source: own table based Czech Republic case study

Most Czech grassland is managed extensively (in the sense of inputs used) but using advanced machinery appropriate to the large parcel and farm sizes in the Republic. The two grassland entry-level schemes studied, for meadows (B1) and pastures (B7), support extensive grassland management that aims to limit the risks of both intensification and underuse, and are targeted at grassland where no priority habitats have been identified. The seven higher-level grassland schemes are targeted at specific priority grassland habitat types or groups of habitats (often at risk of abandonment), with management actions

defined as appropriate. For the higher- level schemes B4, B5, B6 and B9 farmers can see the eligible habitat areas identified on their LPIS maps. There is no differentiation between entry-level and higher-level targets for the grassland schemes, which collectively have a target uptake of 680,000 ha (75 per cent of the eligible area for all the grassland schemes).

The entry-level scheme for the conversion of arable land to grassland (C1) comprises four packages of management actions for different types of conversion: to grassland; to grassland along water bodies; to grassland using a regional seed mixture; and to grassland using regional seed mixture along water bodies. The scheme for cover crops (C2) is designed to address both soil degradation and nutrient loss on land designated as NVZs (two million ha, almost 48 per cent of agricultural land), mostly in arable farming areas. The target uptake for all three arable schemes (both entry-level and higher-level) is 300,000 ha.

4.2.2 Bulgaria

Entry-level actions reviewed: *HNV grasslands; crop rotations; soil erosion control.*

Bulgaria has had very limited experience of implementing agri-environment schemes. Although the pilot regional schemes were designed as long ago as 1998, the first pilot SAPARD agri-environment schemes only opened to farmers in late 2006. The current programme is a group of 'standalone' entry-level schemes without associated higher-level schemes or management actions[28]. It consists of five entry-level schemes each comprising one or two packages, which can in some cases be combined. These are set out in Table 4.3, with the entry-level components selected for further study indicated by shading.

Table 4.3: Agri-environment schemes in Bulgaria

Level	Scheme	Target
Entry-level **Horizontal and zonal**	Organic farming: • organic farming (OF) • organic apiculture	
	Traditional livestock breeding: • local breeds (LB1) • mountain pastoralism (LB2)	
	Restoration and management of HNV farmlands:	
	• on undergrazed HNV grasslands (HNV1) • on overgrazed HNV grasslands (HNV2) *(these two grassland schemes have since been merged)* • on arable lands in IBAs (HNV4)	200,000 ha
	Soil and water protection: • crop rotation (SW1) • soil erosion control (SW2)	 10,000 ha 90,000 ha
	Landscape features: • maintenance of traditional orchards (LF3)	 11,000 ha

Source: own table based on Bulgaria case study

[28] In the context of Bulgarian agriculture organic farming and traditional livestock breeding can be considered as entry-level because they are aimed at supporting existing farming systems under threat.

The undergrazed grassland scheme (HNV1) as well as the scheme for mountain pastoralism (LB2) are intended to address the risk to biodiversity and habitats from abandonment of traditional livestock farming. During the preparation of the RDP in 2007, the total area of the parcels of permanent pasture identified as high nature value (HNV) farmland covered as much as 1,138,981 ha[29]. The impact target area under this scheme is 200,000 ha, equivalent to approximately 17 per cent of the area initially identified as HNV permanent pastures. The schemes for and water and soil protection are targeted by prioritising applications from NVZs and municipalities with moderate to severe erosion problems, respectively.

4.2.3 Finland

Entry-level actions reviewed: *basic management scheme of six compulsory packages*

The agri-environment programme in Finland is based around an entry-level basic management scheme of six compulsory packages of management actions which all beneficiaries implement, plus an additional option which applicants choose from a supplementary menu (some of these build directly on the compulsory elements, for example more restrictive fertiliser requirements). The entry-level scheme is a mix of different types of management actions collectively focussed on reducing diffuse pollution; it is targeted at 93 per cent of farmers and 98 per cent of arable land and accounts for 88 per cent of total agri-environment expenditure in Finland (2009 figures[30]). The remainder of the programme comprises the 'special options' scheme with packages of higher-level management actions, some of them horizontal (for example organic farming), others zonal or targeted (for example long-term grass crops on arable land with peaty soils). These are set out in Table 4.4, with the entry-level components selected for further study indicated by shading.

Table 4.4: Agri-environment schemes in Finland

Level	Scheme	Packages of management actions	Target
Entry-level horizontal	**Basic scheme - compulsory section**	Environmental planning and monitoring of farm practices Establish 'environmental fallow' areas on 5-15% of the land Fertilisation of arable crops Fertilisation of horticultural crops Headlands and buffer strips Maintenance of biodiversity and landscape	98 % of arable land 93% of farmers
	Basic scheme - additional options	Reduced fertilisation Plant cover Crop diversification Extensive grassland Catch crops Horticultural options	

[29] Bulgarian RDP version 4, July 2010

[30] Based on 2009 data (Aakkula *et al*, 2010)

Medium-level and higher-level zonal and/or targeted	**Special options**	Organic farming Local breeds and crops Riparian zones Wetlands Groundwater Water management, habitat management Grass on peatland arable soils	

Source: own table based Finland case study

4.2.4 France

Entry-level actions studied: *extensive grazing systems; diversification of arable crop rotations*

The national programme of the 2007-13 RDP, the *Plan de développement rural hexagonal* (PDRH) consists of the nine agri-environment schemes shown in Table 4.5, of which two are national schemes, six are regional but not zoned (the scheme specifications are national but it is delivered locally) and one scheme is completely regional, with a different menu of actions for each region and farm and applied in specific zones. Three of these schemes are entry-level. Of these, the two national schemes for extensive grazing systems and diversification of arable crop rotations have been selected for further study and are indicated by shading in Table 4.5.

Table 4.5: Agri-environment schemes in France

Level	Territorial coverage	Schemes
Entry-level	**National**	Scheme A - extensive grazing systems
		Scheme B - diversification of arable crop rotations
Higher-level	**Regional but not zoned**	Scheme C – low input mixed crops and livestock fodder system
		Scheme D - conversion to organic farming
		Scheme E - maintenance of organic farming
		Scheme F – protection of endangered breeds
		Scheme G – Conservation of endangered plant resources
		Scheme H – Enhancing the potential of honeybee pollination for biodiversity conservation[31]
	Regional and zoned	Scheme I - Territorial agri-environment schemes: I.1 - Natura 2000 issue; I.2 - Water Framework Directive issues; I.3 - other environmental issues.

Source: own table based on France case study

[31] This scheme is close to the reference level and therefore considered to be entry-level (apiculture is one of the entry-level categories in the typology), and in France it is available only in specific areas within each region

The aim of the extensive grazing scheme is to stabilise grassland management in areas threatened by abandonment and to maintain environmentally friendly production methods, encouraging reduced levels of nitrogen fertiliser use, longer grassland rotations and protection of biodiversity features. The scheme to diversify crop rotations is aimed at reducing the need to use plant protection products by creating a longer interval before a crop returns to the same plot (and thus disrupting the cycle of crop-specific pests); an additional objective is limiting run-off by planting a more varied range of crops.

4.2.5 Italy

Entry-level actions reviewed in four groups from three different RDPs: *crop rotation, cover crops, minimum tillage, reduction of fertiliser; increase organic component of arable soil; maintain permanent meadows; maintain permanent pasture.*

In Italy the RDPs are programmed and implemented by 21 regional governments within the framework of the National Strategy for Rural Development. Three have been examined in depth: Lombardia, Lazio and Campania in North, Central and Southern Italy respectively. These regions represent the varied bio-geographic, agricultural and environmental context of agri-environment schemes in the Italian regions; the agricultural characteristics of the three regions are shown in Table 4.6. Agri-environment schemes account for around a quarter of the total programmed RDP expenditure in Lombardia (27 per cent) and Lazio (25 per cent), while in Campania the proportion is just 12 per cent.

Table 4.6: Agricultural characteristics of the three Italian regions

Region	Farming types				Intensity of management			Farm structure
	Arable land % UAA	Permanent pasture and meadows %UAA	Permanent crops % UAA	Grazing livestock (% of all LSU) 2007	Livestock density index (LSU/100 ha of UAA) 2007	Irrigated area % UAA 2007	Spending on crop inputs (€/ha UAA) 2007	Average farm size (ha/ holding)
Lombardia	70	27	4	43	279	62		17
Lazio	48	32	20	89	53	16		7
Campania	53	20	27	83	81	21		4
Italy (all)	55	27	18	56	78	21	151	8

Source: own table based Italy case study

The agri-environment programmes in Italy are not clearly structured into entry-level and higher-level schemes, and more than half the agri-environment expenditure is on schemes supporting organic farming and integrated farming, which have been excluded from the analysis for this study (as explained in Chapter 1). Excluding these, four different types of entry-level or equivalent schemes can be identified across Italy, and have been selected for further study in the three regions as shown by shading in in Table 4.7. Type 1 is targeted at protecting soil and water resources in arable and permanent cropping systems and Type 2 at using organic fertilisers to increase the levels organic matter in arable soils (and help to reduce a surplus of manure and slurry from livestock farms). Types 3 and 4 are applicable only to grazing livestock systems, mainly in mountain areas, and are zonally targeted at

extensive grassland management for biodiversity and water resource protection - for example where there is a risk of land abandonment, in Natura 2000, NVZs and other designated or priority areas.

Table 4.7: Agri-environment schemes in Italy

Types of entry-level scheme	Application in 21 RDPs in Italy	Uptake in 2009 in RDPs selected for study (not targets)		
		Lombardia (North)	Lazio (Centre)	Campania (South)
Type 1 Crop rotation, cover crops, minimum tillage, reduction of fertiliser	13 RDPs	30,952 ha 1,087 contracts	2,324 ha (contracts n.a.)	3,000 ha 80 contracts
Type 2 Increase organic component of arable soil	8 RDPs		200 ha (contracts n.a.)	673 ha 77 contracts
Type 3 Maintain permanent meadows (mainly mown)	All RDPs in Northern Italy, some in Central and Southern Italy	22,702 ha 1.794 contracts		
Type 4 Maintain permanent pasture (grazed)				27,000 ha 720 contracts

Note: this table shows selected entry-level schemes/RDPs, not the whole programme, and uptake data for 2009, not targets (n.a. not available). Source: Mid-Term Evaluation Reports, 2010

4.2.6 Poland

Entry-level actions reviewed: *sustainable agriculture; extensive management of meadows and pastures; undersown catch crop; winter catch crop; summer catch crop; 2m and 5m buffer strips (riparian and field margin)*

The current RDP is only the second to have been implemented in Poland, and the agri-environment programme consists of nine agri-environment schemes, all of them available across the whole territory. Four of the schemes are entry-level, and five can be considered as higher-level, including two targeted at habitats and species (one specifically for Natura 2000). Many of the schemes have several variants, as shown in Table 4.8 where those selected for further study are indicated by shading.

Table 4.8: Agri-environment schemes in Poland

LEVEL	SCHEME	VARIANTS	TARGET
Entry-level	Sustainable agriculture	Sustainable agriculture	6,000 farms 150,000 ha
	Extensive permanent grassland	Extensive management of meadows and pastures	190,000 ha
	Soil and water protection	Undersown catch crop	100,000 farms 1 million ha
		Winter catch crop	
		Summer catch crop	
	Buffer strips	2 m riparian	200 farms 650 linear metres
		5 m riparian	
		2 m field margin	
		5 m field margin	

Higher-level	Protection of species and habitats outside Natura 2000 areas	Ten variants	
	Protection of species and habitats within Natura 2000 areas	Ten variants	
	Conservation of local crop varieties	Four variants	
	Conservation of local breeds	Four variants	
	Organic farming	Twelve variants	
Target for whole AE programme			353,000 farms 1.5 million ha

Source: own table based on Poland case study

The entry-level schemes mainly address problems of water pollution and soil degradation, as well as biodiversity. The schemes for sustainable agriculture and extensive meadows and pasture aim to support extensive management of both arable and grassland, for example by nutrient planning, crop rotations, fertiliser and stocking limits. The scheme for soil and water protection focusses on maintaining soil cover on arable land throughout the year; the buffer strips are unfertilised permanent grassland managed without fertilisers.

4.2.7 United Kingdom

Entry-level actions reviewed: *hedgerow management; buffer strips; permanent grassland; stubbles/post harvest management; soil erosion; tree management; wildlife strips; grazing management.*

The current programme in England is one of the most complex in the EU, with 67 options in the main entry-level scheme, and almost as many again in the higher-level scheme. The standard Entry Level Stewardship (ELS) scheme described in Table 4.9 is available to all farmers (there is also an organic version with slightly higher payment rates). In the most disadvantaged area of the Less Favoured Area (LFA), farmers can choose instead to apply for an uplands version of ELS which was launched in 2010. The Higher Level Stewardship (HLS) scheme is targeted at specific objectives which vary according to locality, and only those applications considered to offer good value for money are accepted. Almost all HLS contracts are on land that is already under an ELS agreement (indeed this is a prerequisite in the majority of cases), and the relevant management actions in the two schemes are designed to complement each other. The overall uptake target for all agri-environment schemes in England is 70 per cent of the UAA. The elements of the ELS selected for further study are indicated by shading in Table 4.9.

Table 4.9: Agri-environment schemes in England

Level	Scheme	Packages of management actions	Target
Entry-level	Entry Level Scheme (ELS)	Farm environment record	
		Boundary features (13 options)	
		Trees and woodland (9 options)	
		Historic and landscape features (5 options)	
		Buffer strips (10 options)	
		Arable land (12 options)	
		Range of crop types (2 options)	
		Protect soil and water (4 options)	
		Grassland outside Severely Disadvantaged Areas (13 options)	
		Mixed stocking on grassland	
		Grassland and moorland inside SDAs (6 options)	
Higher-level	Higher Level Scheme (HLS)	Boundary features (3 options)	
		Trees, woodland and scrub (13 options)	
		Orchards (4 options)	
		Historic and landscape features (6 options)	
		Arable land (7 options)	
		Protect soil and water (5 options)	
		Grassland (16 options)	
		Moorland and upland rough grazing (8 options)	
		Access (9 options)	
		Lowland heathland (5 options)	
		Inter-tidal and coastal (11 options)	
		Wetlands (12 options)	
		Additional supplements (8 options)	
Target for whole AE programme			2.5 million ha (70% of UAA) 50,000 holdings

Source: own table based UK case study

In Scotland the structure of the RDP is quite different, in that measures from all three EAFRD axes are combined within a single Rural Development Contracts (RDC) scheme, integrating Axis 2 agri-environment and forestry payments with the delivery of Axis 1 and Axis 3 measures. Table 4.10 shows only the agri-environment options, with those selected for further study indicated by shading. The RDC scheme offers a menu of entry-level packages from the three axes, entitled Land Managers' Options (LMOs), available to all farmers and a higher-level strand of targeted Rural Priorities (RPs) to which entry is competitive, as in England. Although this is an integrated scheme, there is no requirement for an RDC contract to include any of the agri-environment options.

Table 4.10: Agri-environment options within the integrated RDP scheme in Scotland[32]

LEVEL	SCHEME	PACKAGES OF MANAGEMENT ACTIONS	TARGET
Entry-level	Land Mangers' Options (LMO)	Rush (*Juncus*) pasture for wildlife	
		Summer cattle grazing	
		Moorland grazing	
		Linear features	
		Grass margins and beetle banks in arable fields	
		Biodiversity cropping	
		Wild bird seed mix/unharvested crop	
		Conservation headlands	
		Winter stubbles	
		Natural regeneration after cereals	
		Farm woodlands (2 options)	
		Animal welfare	
		Organic farming	
Higher level	Rural Priorities (RP)	Organic farming	
		Grassland (9 options)	
		Arable (5 options)	
		Heathland and peat soils (9 options)	
		Wetland (6 options)	
		Hedges (2 options)	
		Farm woodland and scrub (2 options)	
		Habitat and species management (7options)	
		Other (3 options)	
Target for whole AE programme			2 million ha 4,545 holdings

Source: own table based on UK case study

The Scottish entry-level scheme also focuses less on strategic environmental policy targets than ELS does in England, and appears to consist more of a collection of packages designed to address specific issues, although it is worth noting that BAP species are mentioned under a number of options in the guidance notes for farmers. Bearing in mind that much of Scotland's farmland is upland grazing, there is perhaps a surprisingly high proportion of options that mainly address lowland farming systems (five out of 11, three of which are specifically for arable), with only four appropriate for upland livestock farms.

[32] Both the LMO and RP elements of Scotland's Rural Development Contracts scheme combine measures from all three axes of EAFRD within a single scheme. The list shown here includes only the Axis 2 options targeted at agricultural management available in 2011 It excludes Axis 1 and Axis 3 options, and forestry options other than those for small farm woodlands and wood pastures. Source: http://www.scotland.gov.uk/Topics/farmingrural/SRDP/Land-Managers-Options/Availableoptions and http://www.scotland.gov.uk/Topics/farmingrural/SRDP/RuralPriorities/Options accessed on 13 July 2011]

4.3 Relationship of entry-level management actions with other agricultural and environmental payments

In a number of these Member States, some of the entry-level schemes operate alongside other Axis 2 measures which may influence the management of the same area of farmland. These include LFA support, and to a much lesser extent Natura 2000 and Water Framework Directive compensation payments, and possibly the non-productive investment measure although this is unlikely to be used in conjunction with entry-level schemes.

The effects of LFA payments on agri-environment uptake are likely to be mainly in stabilising incomes on marginal farms where the land may be at risk of abandonment. For example in the Czech Republic, LFA payments apply only to grassland and this has motivated some farmers to convert arable land to grassland with support from the entry-level agri-environment scheme targeted at erosion prone arable soils. In England LFA support is being phased out altogether and replaced in the most disadvantaged LFA areas by the recently introduced upland entry-level agri-environment scheme (which is not covered in this study). In contrast Scotland, with a much higher proportion of LFA land, allocates a major share of the RDP budget to LFA support and has relatively few entry-level management packages designed for upland farming systems.

The Natura 2000 measure is not widely used in the countries examined, but a few agri-environment programmes have packages of entry-level management actions targeted specifically at Natura 2000 species or habitats, for example in Poland, Bulgaria (HNV farmland), the Czech Republic (grassland habitats) and the UK (farmland birds in the entry-level scheme, and several Natura 2000 habitats and species in the higher-level scheme).

The only other targeted CAP support which might directly complement entry-level schemes is that provided through Pillar 1 Article 68 payments[33], where these have been used. In the Czech Republic, Article 68 has been used to target additional support at dairy cows, with little effect on grassland management (because most of the dairy fodder is produced on arable land) but in Scotland, where an Article 68 scheme has been introduced to support suckler calves there is a degree of synergy with the entry-level agri-environment package for mixed stocking (sheep and cattle). Similarly in Finland the payment under Article 68 for bulls and heifers is seen as supporting environmental objectives by helping to maintain livestock production in Southern Finland and to limit the replacement of rotational grassland by specialised arable cropping, with its associated problems of soil structure, erosion, and phosphorus run-off (Lehtonen, 2004). In Italy an Article 68 scheme for crop rotation implemented in 2009-10 has characteristics of an agri-environment requirement, but with annual payments, not multi-year contracts.

[33] Article 68 of Council Regulation 73/2009

5 REVIEW OF REFERENCE LEVEL, PAYMENT RATES AND FACTORS AFFECTING UPTAKE OF SELECTED ENTRY-LEVEL SCHEMES

5.1 Introduction

This chapter considers the dynamic relationship between the reference level and entry-level agri-environment requirements and payment rates, and considers the factors affecting farmers' uptake of agri-environment schemes, using the selected examples of entry-level components of agri-environment schemes from the seven Member States described in Chapter 4.

The characteristics of the reference level are outlined first, followed by a discussion of changes in the reference level over time and the influence of these on the content of associated agri-environment schemes. The way in which payment rates are calculated and the different payment structures used in agri-environment schemes are analysed, before considering how these and other factors affect farmers' uptake of entry-level agri-environment schemes.

5.2 The reference level for agri-environment schemes

The concept of the 'reference level' as applied to agri-environment and other farm payments under both Pillars of the CAP is a cost allocation mechanism developed by the OECD in the 1990s. It serves to distinguish between those costs associated with the achievement of environmental outcomes that must be borne by the operator, and those for which private actors should be remunerated (OECD, 1998; Scheele, 1999). The reference level, therefore, defines the dividing line between the level of environmental provision that farmers are expected to deliver at their own expense, and an enhanced level of environmental management for which farmers may be paid to deliver, for example through agri-environment schemes (Kristensen and Primdahl 2006).

The environmental reference level for all area-based payments on farmland under the CAP consists of cross-compliance and other standards that include:

- relevant Statutory Management Requirements (SMR), for example elements of the Habitats or Birds Directives relating to Natura 2000 habitats and species, which apply in all Member States except Bulgaria and Romania, where they will be phased in from 2012;
- standards of Good Agricultural and Environmental Condition (GAEC) (some of which are optional for Member States to apply) defined by Member States within the common EU framework[34] shown in Table 5.1;
- other national or regional regulations that apply at farm level.

In addition, recipients of agri-environment payments must also comply with:

- requirements on the use of fertilisers and plant protection products which Member States must define in the RDP[35]. Some examples of these types of requirements

[34] Regulation EC 73/2009, Annex III

[35] As required by Article 39(3) of Regulation 1698/2005

placed on farmers are shown in Annex 5.

Table 5.1: Framework of issues and standards for GAEC cross-compliance

Issue	Compulsory standards	Optional standards
Soil erosion: Protect soil through appropriate measures	- Minimum soil cover	- Retain terraces
	- Minimum land management reflecting site-specific conditions	
Soil organic matter: Maintain soil organic matter levels through appropriate practices	- Arable stubble management	- Standards for crop rotations
Soil structure: Maintain soil structure through appropriate measures		- Appropriate machinery use
Minimum level of maintenance: Ensure a minimum level of maintenance and avoid the deterioration of habitats	- Retention of landscape features, including, where appropriate, hedges, ponds, ditches trees in line, in group or isolated and field margins	- Minimum livestock stocking rates or/and appropriate regimes
		- Establishment and/or retention of habitats
	- Avoiding the encroachment of unwanted vegetation on agricultural land	- Prohibition of the grubbing up of olive trees
	- Protection of permanent pastures	- Maintenance of olive groves and vines in good vegetative condition
Protection and management of water: *Protect water against pollution and run-off, and manage the use of water*	*- Establishment of buffer strips along water courses*	
	- Where use of water for irrigation is subject to authorisation, compliance with authorisation procedures	

Note: standards shown in *italics* were added in 2009 (source: Annex III of Council Regulation EC 73/2009)

Member States have defined GAEC and other standards in ways that reflect their different national and regional circumstances and priorities, which means that the reference level management actions underpinning agri-environment schemes differ not just across the EU, but between regions, although the need to reflect the EU legal framework of cross-compliance and GAEC standards does limit these differences to a certain extent. Even within a region the impact of the reference level on farm management may differ between farm types (arable, livestock or permanent crops) or between similar farms in different locations (NVZs or Natura 2000 areas for example).

5.2.1 Changes in the reference level over time

The reference level is not static and changes are initiated by the national or regional authorities, in response to changes in EU legislation or their own domestic priorities. The timing of these changes are not always synchronised with RDP programming periods. Some

of the Member States studied appear to have revised GAEC and national standards more frequently than others, and therefore to have updated the associated agri-environment schemes more frequently too, although this is not the only reason for revising agri-environment schemes, as discussed in Chapter 6.

In Member States with a long history of agri-environment schemes, such as the UK and France, there have been significant milestones of CAP reform over the past 20 years which have provided the opportunity or obligation to change the agri-environment reference level. For the EU-15 Member States, cross-compliance was introduced as a voluntary option in the 1992 McSharry reform[36], followed by the requirement for standards of Good Farming Practice to underpin agri-environment schemes in 1999[37], the cross-compliance GAEC/SMR framework of standards in 2003/2005[38] and revisions to GAEC and SMR in the 2009 Health Check of the CAP[39]. The latter distinguished between compulsory and optional standards and introduced new compulsory standards for water abstraction and unfertilised buffer strips along watercourses (to be implemented by 2012). Other changes, implemented in 2010, were a more detailed specification of landscape features, and an optional standard for the establishment and/or retention of habitats (offering an opportunity to recapture some of the environmental benefits of set-aside).

The timeline for the EU-10 Member States has of course been shorter, although they have had the experience of defining standards of Good Farming Practice for the 2004-06 RDPs. For the EU-2 it is shorter still, and they are still in the process of developing and adjusting cross-compliance standards, as experience in Bulgaria shows. GAEC cross-compliance now applies to all EU-12 and, although SMR requirements will be fully phased in only in 2016, where pre-existing national legislation is comparable to environmental SMRs (for example in habitats and species protection in Bulgaria) this is regarded as part of the reference level.

The case studies illustrate the extent to which year on year change takes place in GAEC standards in some Member States between these milestone events. Some changes are simply the result of a time lag caused by phasing in (for example of new standards in 2010 and 2012), and some are the result of a national or regional decision to adjust or refine existing standards. Experience in France illustrates how frequently GAEC standards can be changed within the timescale of one RDP programme. Six GAEC standards were introduced in 2005 and there were modifications in 2006, 2007 and 2009, with all standards modified at least once and some twice. In 2010 the six standards were replaced by a new set of seven GAEC standards that combined some elements of the earlier set with new requirements. The detail of these changes, which had the effect of progressively strengthening and refining the standards, is shown in Annex 4. In Poland significant changes and additions were made

[36] Only a limited number of Member States implemented voluntary cross compliance – Denmark, France, Greece, the Netherlands and the UK.

[37] Regulation EC 1257/1999 Article 23

[38] Regulation EC 1782/2003 and Regulation EC 1698/2005

[39] Regulation EC 73/2009

in moving from the Good Farming Practice standards of the 2004-06 RDP to the GAEC standards for 2007, but few if any changes have been made during the current programme. In Finland the reference level has been subject to even less frequent change, partly because it was already quite well developed in national environmental legislation before GAEC cross-compliance was introduced. The first agri-environment programme in 1995-2000 was based on a reference level which included, for example, restrictions on fertiliser applications and requirements for riparian buffer strips, and by 2000 the whole country had been designated as a Nitrate Vulnerable Zone and all farmers had to comply with the requirements. The process of implementing EU cross-compliance standards was therefore relatively simple, and adjustments were made to agri-environment schemes to ensure these remained above the new reference level.

Reference level requirements for permanent pasture offer another example of changes over time. There are two requirements stipulated at the EU level. Firstly Member States must define a compulsory GAEC standard for the protection of permanent pastures. Secondly, a quantitative requirement obliges Member States to prevent any significant decrease in the total permanent pasture area recorded in 2003-2005[40], but until the decrease reaches 10 per cent nationally there is no requirement to apply corrective measures at farm level for the re-conversion of arable land into permanent pasture. In the UK existing Environmental Impact Assessment legislation protecting semi-natural habitats from agricultural intensification was incorporated as a GAEC standard, and there is no farm level requirement to maintain the proportion of other permanent pastures. In France the reference level for grassland agri-environment schemes has developed over a period of seventeen years from no defined requirements in 1993 to the most recent version of GAEC standards in 2010 which requires the maintenance of the proportion of permanent pasture and temporary grassland at farm level, and specifies minimum stocking rates or fodder yield.

Bulgaria provides an example, during the current RDP, of refining part of the GAEC standard for the protection of permanent pasture by defining a separate standard specifically for environmentally valuable pastures. Bulgaria has large areas of HNV grassland where abandonment is a major environmental problem, and the 2007 GAEC standard (for clearance of unwanted bushes), as originally defined and implemented by the Bulgarian authorities, led to the destruction of valuable semi-natural habitats (see Box 5.4 for details). In 2010 the GAEC standard was split into two with a new, separate standard introduced specifically for HNV farmland, Natura 2000 and other protected areas. This allows farmers entering an agri-environment contract to retain scattered single trees or coppices, shrubs and/or hedgerows, covering up to 25 per cent of the overall grassy area, depending on the previous condition of the meadow or pasture[41], but leaves them excluded from SAPS and other area based support payments, where the original GAEC standard for clearance of vegetation still applies.

Within a region or Member State reference level requirements can have a different impact on farms of similar type in different places, not just as a result of inter-regional variations in GAEC standards. For example, in NVZs the restrictions on agricultural land management and

[40] Article 6(2) of Council Regulation 73/2009.

[41] Order of the Minister of Agriculture and Food RD- 09-616/ 21.07.2010.

the requirements for record keeping arising from the Nitrates Directive cause quite significant differences in the extent and costs of cross-compliance between different types of farm, as the example from the UK shows (Box 5.1).

Box 5.1: Differing costs of compliance with SMR4 (Nitrate Vulnerable Zones) in England

In England the area of land designated as Nitrate Vulnerable Zone (NVZ) increased from around 55 per cent of the territory to 70 per cent on 1 January 2009. The government regulatory impact assessment of the change indicated that this was expected to lead to a substantial increase in costs for the agricultural industry, amounting to between €819 and €1261 million[42] per annum, or between 1 and 30 per cent of farm business profit[43], borne mainly by livestock farms. In a survey carried out by ADAS *et al* (2009), 47 per cent of respondents said they had made changes to comply with SMR4 requirements for NVZs, and consultation evidence indicated that inclusion of NVZ regulations in SMR cross-compliance had increased farmers' awareness and understanding of their obligations, but many struggled with the record keeping requirements. Farmers viewed these as an unnecessary burden and were therefore reluctant to comply. Breaches were found at 6.2 per cent of inspections in 2006, and 3.9 per cent in 2007. Of these failures, 32 per cent were on cereals or general cropping farms, but nearly half the failures related to incomplete records rather than evidence of poor practice in the field.

Source: UK case study

5.2.2 Management actions in the reference level and in agri-environment schemes

Descriptions of management actions at farm level are used as the means of defining both the verifiable standards of the reference level and the requirements of entry-level agri-environment schemes. Of the eight most common categories in the typology described in Chapter 2, seven include types of management actions that are also used as reference level standards, particularly in GAEC and in requirements for the use of fertilisers and plant protection products. These categories are: *management of grass and semi-natural forage*, *input management*, *management plans and record keeping*, *management of soil cover*, *soil management, buffer strips* and *landscape feature management.* Of course not all the types of management action in each of these categories will be used in the reference level of a particular RDP, nor will there always be associated agri-environment schemes, but where there are it is necessary to make a clear distinction, in payment calculations and on the ground, between what a farmer is required to do to meet reference standards and what is paid for under the agri-environment scheme.

5.2.3 Effect of changes in the reference level on the design of agri-environment schemes

When changes to the reference level have the effect of 'moving' specific management actions from agri-environment schemes (paid for) into obligatory reference level standards (unpaid) it will be necessary to update both the management requirements and the payment rates in the agri-environment schemes. Changes in the reference level have in

[42] £655.1 and £1009 million, using conversion factor of £1 = €1.25

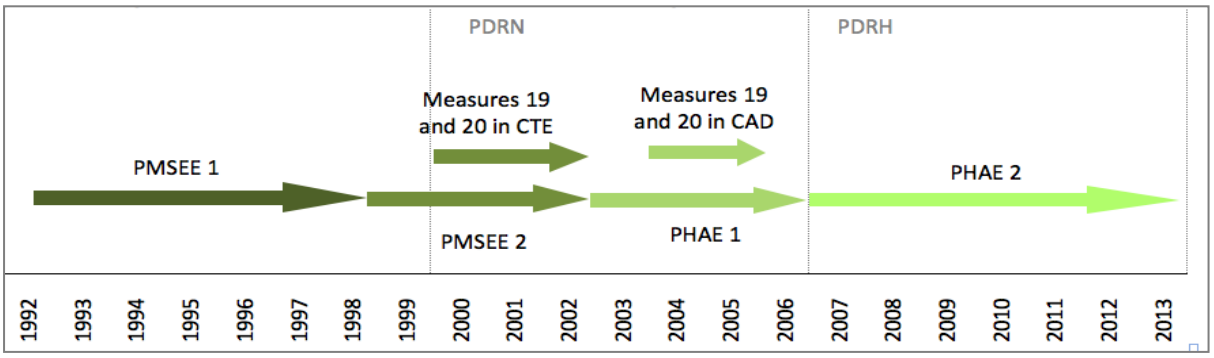
[43] RIA attached to explanatory memorandum to the Nitrate Pollution Prevention Regulations 2008: No. 2349 http://www.legislation.gov.uk/uksi/2008/2349/pdfs/uksiem_20082349_en.pdf

some cases been accompanied by only minor changes to entry-level agri-environment schemes and in others by the complete replacement of an existing scheme with a new one, possibly with slightly different objectives.

In the Czech Republic, when a more demanding GAEC standard for crop rotation was introduced in 2010, the range of possible crops was reduced in the cover crops agri-environment scheme and this had the effect of substantially reducing both payment rates and uptake. On a much longer time scale, the first agri-environment crop rotation scheme in France was introduced in 2000 at a time when Pillar 1 oilseed and protein crop payments were aligned with those for cereals, and there had been a significant reduction in the diversity of rotations, simplified around the two most profitable crops. In this case the rotational scheme probably played a role until the reference level became more demanding with the arrival of GAEC cross compliance standards.

In France there has been a long series of changes to the reference level and entry-level agri-environment management requirements relating to extensive grassland management. The timescale of the different schemes, some of which have overlapped is illustrated in Figure 5.1, and the changes to reference level, agri-environment management requirements, payment rates and uptake is summarised in Table 5.2. In other cases schemes have eventually been removed. The original crop rotation 'sunflower' scheme in France was first modified (by adding a requirement for mechanical weed control) during the 2001 RDP revision and integrated into the agri-environment programme, but later suspended because most of its requirements were put into the new GAEC cross compliance standard for crop rotation. An agri-environment 'rotational' scheme was again included in the 2007-13 RDP, but in 2008 and 2009, this measure was not considered a priority and the agri-environment budget was allocated to other schemes such as the grassland scheme PHAE2.

Figure 5.1: Implementation of the 'grassland premium' schemes in France from 1992



In some regions of Italy there is a considerable weight of expenditure on contracts from previous programming periods because several regions set up new contracts during 2005-6[44]. In many cases these farmers have been able to alter their contracts to implement new

[44] In Lombardia this 'carried forward' expenditure represents around 90% of the total agri-environment expenditure in 2007-2009 (32% for the whole 2007-2013 programming period), in Lazio it is around 65% in the first two years and 22% for the whole 2007-2013 programming period, while In Campania expenditure in 2009 on contracts from the previous programming period was ten times that on contracts initiated since 2007.

measures offered in the current RDP, although the level of payments is generally lower and the technical commitments are substantially higher as a result of changes in SMR and GAEC standards.

Changes to the reference level may not affect all entry-level elements of an agri-environment scheme. During the first two years of the 2007-13 programme in Bulgaria there were three changes of the GAEC standards and four notifications of the RDP, but these changes did not alter the boundary between reference level and agri-environment management actions and therefore did not necessitate changes to the payment rates. The rates were in fact changed, but the main motivation for recalculating the payment levels was the changed economic situation in the country. The effect of changes in the reference level on uptake may not necessarily be in those entry-level schemes that 'lose' management actions to the reference level. It could be argued that in the Czech Republic the more demanding reference level standards for erosion-prone soils have provided an additional incentive for farmers to convert arable land at high risk of erosion to grassland with agri-environment support (although in practice uptake of that scheme seems to be constrained by other factors).

In England some the biggest changes in reference level and associated entry-level options have been in the context of soil and water management and protection, largely driven by the change from GFP to GAEC in 2005, as described in Box 5.2, which introduced a new GAEC standard that is more stringent than the original agri-environment measure. In the Czech Republic the main change in the reference level was in 2010 to improve the effectiveness of protection against soil erosion. The revised standards are quite demanding and require changes which some farmers find difficult to comply with, for example not growing row crops on certain parts of fields, and implementing specific farming practices on vulnerable soils. Changes to grassland GAECs concerned details of reseeding and autumn mowing, and seem to have caused fewer problems (Becvar, 2010).

Table 5.2: Changes in the reference level and agri-environment requirements for grassland in France 1993-2010

<table>
<tr><th colspan="2">Years</th><th>1993-1997</th><th>1998</th><th>1999</th><th>2000</th><th>2001</th><th>2002</th><th>2003</th><th>2004</th><th>2005</th><th>2006</th><th>2007</th><th>2008</th><th>2009</th><th>2010</th></tr>
<tr><td colspan="2">RDP</td><td colspan="3">-</td><td colspan="7">PDRN</td><td colspan="4">PDRH</td></tr>
<tr><td colspan="2">Schemes</td><td>PMSEE1</td><td colspan="2">PMSEE2</td><td colspan="2">PMSEE2 +CTE</td><td>PHAE1</td><td colspan="2">PHAE1 +CAD</td><td>PHAE1</td><td colspan="4">PHAE2</td></tr>
<tr><td colspan="2" rowspan="4">Reference level</td><td colspan="3" rowspan="4">-</td><td colspan="7" rowspan="4">Good agricultural practice</td><td colspan="4">Implementation of cross-compliance:</td></tr>
<tr><td>9 SMRs</td><td>16 SMRs</td><td colspan="4">19 SMRs</td></tr>
<tr><td colspan="3">6 GAEC</td><td colspan="3">7 GAEC</td></tr>
<tr><td colspan="2">-</td><td colspan="4">Art.39(3) requirements for beneficiaries of agri-environment measures</td></tr>
<tr><td rowspan="3">Management required by the reference level</td><td>Art 39(3) conditions of AE contract</td><td colspan="6">-</td><td colspan="6">Requirements for fertilisation practices and use of crop protection products (see Annex 5)</td></tr>
<tr><td>GAEC 5: minimum level of maintenance of land</td><td colspan="3">-</td><td colspan="4">• Good farm management;
• Nitrogen fertilisers: not more than 170 kg/ha of organic nitrogen in vulnerable area;
• Stocking rates to maintain vegetation without damaging the conservation of natural resources;
• Possible restrictions on use of mountain pastures, for soil protection.</td><td colspan="3">• Cropped land (cereals, oilseed crops and nut orchards) must all be sown and maintained in accordance with local practice until the crop flowers;
• Pasture management criteria to be defined at the local level, and must include minimum stocking rates and grazing/mowing requirements;
• Set-aside land (compulsory or voluntary): requirements for minimum maintenance of land, type of cover (spontaneous or sown), specific requirements for meadows, fertilisation, succession of crops and set aside, and specific rules for environmental set aside.</td><td colspan="3">Two categories of land defined:
• Cropped land (cereals, oilseed crops and nut orchards) must all be sown and maintained in accordance with local practice until the crop flowers;
• Land taken out of production (set-aside): no bare soil, establish cover (spontaneous or sown) without fertilisation; apply no more than 50 kilos of total nitrogen per hectare, observe rules for crushing and mowing.</td></tr>
<tr><td>GAEC 6: Preservation of permanent pasture</td><td colspan="3">-</td><td colspan="4"></td><td colspan="3">Maintenance of a proportion of permanent pasture in UAA at the national level concerns all farmers benefiting from direct aids and having permanent pasture.</td><td colspan="3">Three requirements are defined:
• overall maintenance of grasslands at the farm level: 50% of reference area (2010) for temporary grass, 100% for permanent grass;
• minimum density of livestock of 0.4</td></tr>
</table>

						LU/ha or minimum yield; • maintenance of permanent pasture ratio, with 2005 as reference year.
Management required by the agri-environment scheme	Fertilizing practices	Not defined	• 130 units N/ha/year (of which no more than 70 as mineral)	• 120 units N/ha/year (maximum 60 units as mineral) • maximum 60 units P/ha/ year as mineral • maximum 60 units K /ha/year as mineral)	• 125 units N/ha/year (maximum 60 as mineral) • 90 units P/ha/year (maximum 60 as mineral) • 160 units K/ha/year (maximum 60 as mineral)	
	Chemical weeding	Not defined		Chemical weeding only with licence	Prohibition of chemical weeding, excepted for control of thistle, *Rumex*, weeds and invasive species, and maintenance of fencing	
	Pasture specialisation level	Not defined	-	CTE/CAD and PHAE: between 0 and 75%	Between 50% and 75%	
	Density of livestock	Not defined	< 1 LU/ha	PHAE: < 1.4 LU /ha and CTE/CAD: < 1.8 LU /ha	< 1.4 LU /ha	
	Maintenance of permanent grassland	Not defined	Retain during the 5 year contract			
	Maintenance of temporary grassland	Not defined	Preservation of meadow areas	Ploughing or moving allowed once during the 5 year contract	Ploughing or moving allowed once during the 5 year contract, but only of 20 % of the area under contract	
	Permanent elements of landscape	Not defined	Maintenance of permanent landscape elements (hedges, ponds, etc.)	Maintenance of permanent landscape elements (hedges, ponds, etc.)	Maintenance permanent landscape elements of biodiversity interest on minimum 20% of the pasture area under contract	
	Payment rates	€30 /ha	€45 /ha, with a ceiling of €4 500 /year	€68 /ha average, with a ceiling of €7 500 /year	€76 /ha/year, with a ceiling of €7 600/year	
Implementation	Beneficiaries	100 000	76 400	57 000 for PHAE1 and 13 000 for CTE/CAD	52 800	
	Grasslands under contract	5 M ha	5 M ha	3.2 M ha for PHAE1 and 1.5 M ha for CTE/CAD	3.5 M ha	
	Amount		€893 M	823 M € for PHAE1 and €136 M for CTE/CAD	€494 M	
	annual average amount		€179 M	€137 M	€124 M	

Source: France case study

Box 5.2: Relationship of reference level and agri-environment options for soil erosion (UK)

In England soil management is one of the issues that have come to the fore in recent years. It was not a priority in earlier schemes, which were more concerned with wildlife, landscape and historic features. Resource protection was included as an objective in Environmental Stewardship when it was first introduced in the 2000-2006 programming period, with separate options for a Soil Management Plan (SMP), the management of high erosion risk cultivated land, and the management of maize crops to reduce erosion.

The GAEC standard for soils in England is the Soil Protection Review (SPR) which requires the farmer to 1) identify any soil issues, 2) implement measures to manage this land appropriately, and 3) review this action on at least an annual basis. The requirement to 'self-police' through reviewing the plan is potentially significant and it differs from SMPs originally offered as an entry-level agri-environment payment simply for preparing a plan. The SPR reference level is thus a more powerful tool than the agri-environment SMP, which was withdrawn from the start of the Rural Development Plan for England (RDPE) 2007-13, following a review of the agri-environment schemes and concerns expressed by the European Commission that the distinction between the requirements of the SMP and those of the cross compliance SPR, which forms the legislative baseline, was insufficient to justify a paid option[45]. The agri-environment option for the management of high erosion risk cultivated land was also withdrawn, but in 2009 new options were introduced for buffer strips for watercourses on cultivated land; enhanced management of maize crops to reduce soil erosion and runoff; and maintenance of watercourse fencing. These were followed in 2010 by two further new options: in-field grass areas to prevent erosion and run-off; and winter cover crops.

In a survey carried out by Momenta in 2007, 28 per cent of respondents said they needed to change their practices to comply with the SPR. However, in a survey carried out by ADAS *et al* (2009), 50 per cent said that they would need to make changes. The SPR was second only to buffer strips (GAEC 14) in the amount of concern created among farmers following its introduction. ADAS *et al* (2009) quoted press coverage indicating that farmers believed that it created extra costs by going beyond legislative requirements for environmental enhancement. Findings from practitioner workshops and expert interviews indicated that, while GAEC 1 had raised awareness of soil issues, the SPR was viewed as having little or no value by many farmers. It was often considered to be a 'box-ticking' exercise and an unnecessary burden, making farmers reluctant to complete it. Some breaches were recorded, reaching 3.6 per cent in 2007.

Scotland, in contrast, has five separate more prescriptive GAEC standards for soil erosion, but the standard for buffer strips has not yet been implemented. Within entry-level schemes the only option to manage soil erosion is 1.5 - 6m buffer strips.

Source: UK case study

[45] http://www.defra.gov.uk/rural/rdpe/sectf.htm#q17, accessed 18 March 2011

5.2.4 Distinguishing reference level and agri-environment requirements at farm level

The administratively clear-cut distinction between what is required by the reference level and what is paid for under an agri-environment contract may be less obvious on the ground. This is illustrated by riparian buffer strips, which will become a compulsory GAEC standard from 2012 and are already a component of both GAEC and agri-environment schemes in many RDPs. Typically, where farmers implement the agri-environment option, there will be a single buffer strip of which the section nearest the water is required by GAEC and is unfertilised but may be cropped or grazed, although some Member States may choose to restrict this; for example in Finland and England (UK) cultivation is prohibited. The width of the GAEC section is 0.6m in Finland, 2m in England, 3m in the Czech Republic and 5m in Bulgaria and France. Adjoining this, on the field side will be the agri-environment strip, typically of unfertilised grassland, sometimes using special seed mixes and mowing regimes to benefit biodiversity; these may be up to 2.4m wide in Finland and 12m in the Czech Republic and the UK (England). The payment calculations are straightforward because it is clear how much of the whole width is an unpaid GAEC requirement, but on the ground the distinction may not always be easy for the farmer to understand. In Finland the width of buffer strip required varies with the importance of the watercourse (minor ditches have no requirement, main ditches must have a 0.6 m reference level strip plus an additional 0.4m - 2.4m strip if the farmer has an the entry-level agri-environment contract). Yet in some cases a single ditch between two farms, both in agri-environment contracts, will have no buffer strip on one side and a 1m strip on the other because the farmers differ in their interpretation of 'main ditch'. One source in Finland[46] reported that farmers feel confused and frustrated with the distinction between the reference level and agri-environment requirements, seen as one more level of complexity for which the rationale is not understood[47]. This is a potentially serious problem, if not all farmers understand that the two requirements are linked and sanctions for non-compliance affect the whole support package.

5.2.5 Possible changes to the reference level for the 2014-20 RDPs

The risk of farmers failing to understand the distinction between reference level and agri-environment requirements, and possibly incurring penalties for several CAP payments, is relevant in the context of a new 'green' CAP payment in 2014. This proposed Pillar 1 payment is conditional upon farmers implementing agricultural practices beneficial to climate change and the environment[48] and the required management actions would then become part of the baseline for agri-environment payments, alongside the existing reference level. The proposed greening requirements include management actions commonly used in entry-level elements of agri-environment schemes in many Member

[46] Source: interview with ProAgria, for FInland case study

[47] Source: interview with ProAgria, for FInland case study

[48] Three requirements have been defined. **Crop diversification:** three different crops to be grown on arable land over 3 hectares, with no crop covering less than 5 per cent of the area and the main crop covering no more than 70 per cent. **Permanent grassland:** maintain 95 per cent of the area of permanent grassland on the holding as declared in 2014. **Ecological Focus Areas:** 7 per cent of the holding (excluding permanent grassland) must be managed as ecological focus areas, examples of which include landscape features, fallow land and buffer strips (European Commission COM(2010) 672 final).

States, and will require changes to some current schemes and payment rates, especially those applicable to intensive arable cropping systems. Box 5.3 illustrates the extent to which similar actions to the proposed Pillar 1 green measures are found in agri-environment schemes in the 2007-13 RDPs.

Box 5.3: Proposed CAP 'greening' requirements within existing entry-level agri-environment schemes

Crop diversification occurs in 27 RDPs, in the form of requirements for *crop rotations*, generally specifying between three and five crop types and aimed at cereal cropping, but also applied to vegetable crops such as potatoes. A requirement to the include legumes in a crop rotation was identified in 17 RDPs, often with a minimum area specified.

Maintenance of permanent grassland is a farm-level agri-environment requirement in 20 RDPs, and forms part of the reference level in several others, in national regulations or GAEC standards. Typically the agri-environment requirements prohibit conversion to arable land and may also restrict ploughing/reseeding of the grassland.

Ecological focus areas are defined in the proposed legislative text[49] as farmland (other than permanent grassland) managed for environmental purposes rather than agricultural production and may include, for example, landscape features, fallow land and buffer strips. The *land out of production* category used in this study has a much narrower definition (similar to that used in the past for set-aside) and was found in 19 RDPs, all but one of them in the EU-15[50]. The area of land out of production is sometimes quoted as a percentage of the holding or cropped area and sometimes in hectares, making comparisons between RDPs difficult, but commonly the requirement is between three and ten per cent of the holding. Other types of entry-level management action may also take land out of production, for example *strips or patches for wildlife*, areas of *rotational fallow* and *buffer strips.* Entry-level agri-environment schemes in more than half the RDPs include the category of *landscape feature management*.

5.3 Calculating payment rates

The way in which agri-environment payments are calculated is defined in the rural development Regulations[51], which also set out maximum payment rates per hectare for different crops. Payments are annual, covering '*additional costs and income foregone resulting from the commitment made*' with the possibility of adding transaction costs of up to 20 per cent '*where necessary*'.

There are several difficulties in using this apparently straightforward calculation to arrive at a payment rate which farmers perceive as appropriate. Although Member States are expected to differentiate payments to take appropriate account of regional or local site

[49] *The CAP towards 2020: meeting the food, natural resources and territorial challenges of the future* (COM(2010) 672 final)

[50] Austria, Finland, Germany (Bavaria, Niedersachsen and Bremen, Rhineland Pfalz, Saarland), Greece, Spain (Basque Country, Castilla la Mancha, Castilla y Leon, Navarra), France, Finland, Ireland, Italy (Emilia Romagna, Toscana, Umbria, Venetto) and UK (Wales).

[51] Article 39(4) of Regulation 1698/2005

conditions and actual land use, the calculation is necessarily based on a typical farm in the target group, which means that the diversity of this group and the way in which the authorities define the farm's costs will affect how well the scheme payment matches the actual circumstances of individual farms. Also there may be some costs borne by the farmer which are not covered by the payment calculation, especially if Member States consider that transaction costs are unnecessary. The payment calculation for two similar schemes in the Czech Republic and UK is shown in Table 5.3 and more examples of payment calculations are in Annex 6.

Table 5.3: Agri-environment payment calculations for extensive grassland management in the Czech Republic and the UK

Czech Republic	**Grassland management - meadows (B1)**	
Summary of the required management	• Limits to fertiliser application (no more that 60 kg N/ha/year); • Prohibition of slurry (except for cattle slurry); • Cutting regime (minimum 2 cuts/year and removal of mown biomass).	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Gross margin on meadows with typical level of fertilising (80 kg N/ha)	219	
Gross margin on meadows with reduced level of fertilising (40 kg N/ha)	144	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**75**
Additional costs		
N/A	Nil	
Total additional costs		Nil
Net cost		**75**
Transaction costs		Nil
Payment rate (100% of net costs)		**75**
England (UK)	***Permanent grassland with low inputs outside Severely Disadvantaged Area of the LFA (EK2)***	
Summary of the required management	• Management by cutting or grazing; • Cutting, harrowing and rolling are prohibited between 1 April and 31 May; • A range of sward heights should be maintained through the season, with at least 20 per cent less than seven centimetres and 20 per cent more than seven centimetres (except when shut up for hay or silage); • Topping and herbicide use (by spot application of weed-wiper) are only allowed for control of injurious weeds and invasive non-native species, or to control scrub invasion; • Feeders must be moved as often as required to prevent poaching; • Nitrogen use is restricted to 50 kilograms per hectare as inorganic fertiliser, or 100 kilograms total, including	

	organic manures; • Liming is allowed.	
Elements of payment calculation	**EUR/ha[52]**	
Income foregone		
Income lost	460	
Savings		
Extra income	285	
Costs saved	165	
Total savings		450
Total income foregone		**10**
Additional costs		
Extra costs	100	
Total additional costs		100
Net cost		**110**
Transaction costs		Nil
Payment rate (97% of net costs)		**106**

5.3.1 Management requirements covered by the payment calculations

The management requirements covered by the payment calculation is a matter of judgement on the part of the managing authority, which may not necessarily coincide with the farmers' perceptions. For example in France the calculation for the current crop diversification scheme does not take account of all the consequential costs of introducing another crop into the rotation, such as finding new markets, additional storage and specialist contractors. In Lazio (Italy) significant differences in costs as a result of geographic factors and farming type are not taken into account.

In the Bulgarian entry-level scheme for HNV grassland the opportunity cost of prohibiting new drainage and ploughing and the use of fertilisers and pesticides is not included in the payment calculation, but payment rates for a similar NGO regional pilot scheme are almost twice as much, calculated under RDP rules two years later. This is partly because more of the management requirements were accounted for in the calculation, but it also covers the loss of Pillar 1 income support payments under SAPS, which some HNV farmers are unable to claim because of the way in which the GAEC requirements for permanent pasture are defined (described in section 5.2.1 above).

In two other examples from Bulgaria there are significant costs borne by the farmer that are not covered by the payment calculation. The soil erosion control scheme has a pre-application requirement to prepare a five-year anti-erosion plan and one of the actions under the soil and water protection scheme requires farmers to take soil samples for analysis of nitrogen, phosphorus and potassium and prepare and implement a five year nutrient management plan with the support of an advisor or qualified agronomist. The costs of these specialist services have not been covered since the end of 2009, when these services were no longer provided free of charge by the government advisory and laboratory

[52] Payments have been converted from GBP using an exchange rate of £1 = EUR 1.25

service[53], but agri-environment payments were not changed to reflect this additional cost, nor was provision transferred to the free Farm Advisory Service (FAS). In the second example, the combination of the original GAEC requirement to clear all unwanted vegetation and a decision not to implement the RDP measure for non-productive investments in Bulgaria has meant that farmers who want to join an agri-environment scheme specifically targeted at undergrazed/underutilized HNV areas first have to clear excessive overgrowth of unwanted vegetation at their own expense. This can be a significant cost in the first year and a disincentive to participate in the scheme.

It is to be expected that there will be differences between schemes in the 'costs incurred' element of the calculation, as a result of different management actions, input, labour and machinery costs, but there are also some differences in the 'costs saved' element too, which seem to be less easily explained. For example, the calculation for winter cover crops in Poland includes a saving in nitrogen fertiliser applied to the following crop, but this is not included in the calculation for the cover crop schemes in the Czech Republic.

5.3.2 Proportion of the net cost calculation used as the payment rate

Payment rates in the case studies vary in the way they are calculated and the degree to which the full net costs are used as the payment. There is no obligation on Member States to use the full net cost derived from the payment calculation as the payment rate offered to farmers, and there are some notable differences in the proportion used, even within the same RDP. The following analysis applies specifically to the entry-level schemes selected for study within the case study RDPs, using data gathered for this study from national sources.

Finland and the Czech Republic are the only case study countries routinely to use 100 per cent of the cost calculation. In Bulgaria all payments theoretically cover 100 per cent of the costs but in practice the Institute of Agricultural Economics does not have adequate data available to ensure an accurate estimation of costs, and this is reflected in comments from farmers and advisers about the adequacy of payments[54]. As many as 75 per cent of all agri-environmental respondent beneficiaries stated that the measure had '*hidden costs that I did not expect'* (Bulgaria RDP MTE, 2010).

In Poland the proportion of net costs used for the payment rate varies, for example from 56 per cent for winter catch crops on arable land to more than 80 per cent for the extensive

[53] The free advice was funded under measure 143 provision of advisory services to farmers; in Bulgaria and Romania until 2009 this covered RDP measures for young farmers, semi-subsistence and agri-environment, but from 2010 to 2013 it only provides free advice for the semi-subsistence measure. Until the end of 2009 under this scheme the National Agriculture Advisory Service (NAAS) advisors were paid to develop the whole package of the necessary documents of the farmers to participate in the agri-environment schemes. This also included the preparation of the nutrient management plans. The requirement for soil N,P,K analysis was not included in the payment calculation because when the measure was designed (NAAS) had a laboratory doing this analysis free of charge for farmers. Due to structural reforms the situation within NAAS was changed and the laboratory is not part of the advisory services anymore. The payment rates were not changed correspondingly.

[54] Source: Bulgaria case study.

arable and extensive grassland management schemes and 100 per cent for buffer strips. In England (UK) the rates generally vary between 68 per cent and 100 per cent of calculated costs, and in France there are smaller differences between the schemes studied (up to 103 per cent for the rotational scheme and 95 per cent for the grassland scheme). In Italy there are differences between schemes and regions, with 100 per cent coverage of costs for the soil management, crop rotation and permanent grassland schemes in Lombardia, and for the permanent crop scheme in Campania. Other payments are geographically differentiated, for example in Campania payments for using organic fertilisers appear to vary between 93 per cent and 100 per cent and between 89 per cent and 100 per cent for the extensive pasture scheme, depending on which 'macro-area' the farm is in. These differences appear to be even greater in Lazio where the green manuring and crop rotation payments appear to cover only 49 per cent of the costs for farms in the lowland plain but 70 per cent of those in hilly areas[55].

One example was found where the payment calculation was adjusted to encourage farmers to make more environmentally beneficial choices. In England (UK) costs are calculated for different widths of buffer strips (2 metre, 4 metre and 6 metre) but for simplicity and to encourage uptake of the wider strips, seen as more beneficial for the environment, the same rate was set for the 4 metre and 6 metre wide buffer strips, at 400 points (equivalent to £400/€500) per hectare, which covered more 100 per cent of the income foregone, but the 2m wide strips were allocated a lower rate of only 77 per cent of income foregone (300 points per hectare).

5.3.3 Transaction costs

Finland is the only Member State among the seven case studies to apply transaction costs to all entry-level payments, at the full rate of 20 per cent, intended to cover the costs and time spent by farmers in understanding the requirements, searching for information and possibly using advisory services; in Italy transaction costs are used to a limited extent In two of the three regions studied (Campania and Lombardia). It is perhaps surprising that so few of the case study regions have included transaction costs in payment calculations. There appears to be scope to use transaction costs more widely to overcome some of the disincentives for participation in entry-level schemes, both where these are being introduced nationally for the first time as in Poland and Bulgaria, and elsewhere in some established schemes. For example, in Italy the burden of transaction costs and administration is a point often raised by farmers and seems to be the main reason for the rather low uptake of the current agri-environment programme compared to the results obtained under previous programming periods and Regulation 2078/1992[56].

5.3.4 Differentiation of payment rates by farming system or farm size

This section describes examples where payment rates for the same agri-environment scheme differ by farming system, farm size or in geographically designated zones. There are likely to be several possible reasons for managing authorities to decide to differentiate payments in this way. The most obvious is that income or cost calculations differ, but the

[55] Source: Italy case study

[56] Source: Italy case study

reasons for using degressive payments are less clear, perhaps related to perceived economies of scale, or cost-effective use of funds.

Farming system

Where entry-level actions are applicable to several different types of farm it is common for the payment rates to differ, reflecting differences in costs and income foregone between systems. For example the payment for the same five compulsory measures in Finland varies from €93 per hectare for arable crops to €450 per hectare for Group 1 horticultural crops.

Farm size

Three of the case study examples have payments that are degressive by area, one applying to entry-level payments generally, and the others only to certain schemes, as shown in Box 5.4

Box 5.4: Examples of degressive agri-environment payments

In the **Lazio region of Italy** entry-level agri-environment payments are degressive, with the per hectare payment *decreasing as farm size* increases:

< 50 ha	no reduction
from 50 to 100 ha	reduced by 15%
from 100 to 150 ha	reduced by 20%
from 150 to 200 ha	reduced by 25%
> 200 ha	reduced by 30%

In **Poland** a similar process is used but payment rates are *degressive only for extensification schemes*, and this *does not apply to Natura 2000 land,* irrespective of the scheme. For the *sustainable agriculture scheme* payments per hectare drop in two stages:

< 100 ha	no reduction
from 100 to 200 ha	reduced by 50%
> 200 ha	reduced by 90%

and in three stages for the *extensive meadows and pastures scheme*:

< 10 ha	no reduction
from 10 to 50 ha	reduced by 25%
from 50 to 100 ha	reduced by 50%
> 100 ha	reduced by 90%

In **Scotland (UK)**, where some farms on marginal land have very large areas of upland semi-natural grazing, there is a cap on total payments per farm per year from the entry-level scheme[57] calculated by applying the following rates to the *total area of the farm:*

€94 per hectare for the first 10 hectares;
€38 per hectare for the next 90 hectares;
€1 per hectare for the next 900 hectares; and
€0.1 per hectare for remaining land (> 1000 hectares).

Source: case studies

[57] This scheme also includes farm-level support under the forestry, Axis 1 and Axis 3 measures. Payments have been converted from GBP using an exchange rate of GBP1 = €1.25.

5.3.5 Scheme payment structures

The schemes studied in the seven Member States show that even within dedicated entry-level schemes there are many variations in the way in which payments are structured and presented to the farmer. These include:

- 'classic' separate thematic schemes each with a list of obligatory management actions and a flat rate euro per hectare payment for the area of land entered into the scheme, as in the Czech Republic;
- separate thematic schemes, but instead of a flat rate payment by hectare, the payment per hectare is degressive as the number of hectares entered into the scheme on that farm increases - the schemes for sustainable agriculture and extensive grasslands in Poland follow this model;
- the all-compulsory entry-level scheme in Finland which has six elements which apply to different land or features across the whole farm, five of them paid as a single flat rate payment per hectare for the whole farm, plus a sixth compulsory element paid at a flat rate per hectare managed (as land out of production) with the farmer able choose the proportion of the arable land to enter (within defined minimum and maximum percentages);
- a self-selection scheme in England (UK) with a very long list of different management options, each with a notional payment rate per hectare or other unit (eg per 100 metres of hedge) managed under that option; the farmer can choose options but must apply these to a sufficient area of land so that the sum of all the notional payments reaches the farm's payment threshold (equivalent to the scheme's flat rate payment per hectare multiplied by the area of farm). Payment is made as a standard flat rate payment per hectare for the whole farm, but this does not increase even if the farmer implements more options than the threshold requires;
- a self-selection scheme in Scotland (UK), which includes not just entry-level agri-environment schemes but also forestry and Axis 1 and Axis 3 options. Each agri-environment option has its own payment rate, paid per hectare of land to which it applies. There is no threshold, but the total payments to the farm under this scheme (agri-environment, forestry and Axis 1 and 3 options) are capped according to the farm size, as described above;
- flat rate payments per hectare differentiated by bio-geographical zone, by farm type, crop type or soil type, as described in Box 5.4 above.

5.4 Targeting entry-level schemes by payments, eligibility or management actions

There are several ways of refining the design and targeting of entry-level schemes to meet differing environmental or agricultural needs, including setting different payment rates for defined geographical areas, limiting eligibility to certain zones, or having several versions of a single package of management actions, suited to different circumstances on the ground.

In Campania (Italy) some payments are differentiated by 'macro areas', and in another Italian region, Lazio, payments differ between lowland and hill farms. In England the flat rate payment is the same everywhere except on parcels of more than 15 hectares within the 'moorland zone' (a defined zone of semi-natural upland heath used for low-intensity grazing), where it is much lower. However, upland farmers have the choice of an alternative entry-level scheme available only in the uplands, with different management options and

payment calculations, and a flat rate payment per hectare twice that of the all-England scheme. In Finland there are three geographical zones for payment calculations, and in most cases the payment rates differ between zones (the management requirements may differ too). There is no geographical differentiation of payments in the schemes studied in Bulgaria, the Czech Republic, France or Poland.

Bio-physical eligibility criteria are used in many different ways. Some schemes define the type of land within the farm where the management action is to be used, for example riparian buffer strips, while others also target specific zones at a larger scale. In Campania (Italy) eligibility for the payments to improve soil organic content is limited to farmland of certain defined soil types, and in Lazio (Italy) the soil cover schemes for arable and permanent crops are prioritised in nitrate vulnerable areas, Natura 2000 and other protected areas, with additional criteria of slope for the arable scheme. In the Bulgarian scheme to control soil erosion, priority is given to applicants with arable land, pastures, orchards and/or vineyards within municipalities with moderate to severe erosion problems. In the Czech Republic there is detailed field-level targeting of soil protection and other agri-environment schemes, including higher-level grassland schemes, fully integrated with the LPIS system (for details see Box 7.1).

Differentiation of management actions to improve environmental outcomes is typically used in higher-level schemes, for example to target specific types of management at different types of grazed habitats, but is also found occasionally in entry-level schemes. There are many examples of variants of a scheme designed to achieve slightly different environmental objectives. For example there are options for using biodiversity seeds mixes on buffer strips in the Czech Republic and also in England (UK), where the options for hedgerow management, permanent grassland and cereal stubbles all have a number of variants. In Finland the scheme to take land out of production has a biodiversity option, described in Box 5.5. Poland and Bulgaria each designed entry-level schemes with specific management options targeted at maintaining the biodiversity value of different types of semi-natural grasslands (a significant environmental resource in both Member States) but in both cases

Table 5.4: Entry-level extensive grassland management schemes in Poland

2004-06 RDP		2007-13 RDP	
sub-scheme	**payment €/ha**	**scheme**	**payment €/ha**
semi-natural meadow cut once by hand	219	extensively managed meadows and pastures	128 (then degressive above 10, 50 and 100ha, except in Natura 2000 areas)
semi-natural meadow cut once by machine	85		
semi-natural meadow cut twice	187		
xerothermic pastures	64		
lowland pastures	85		
mountain pastures 350-500m	49		
mountain pastures >500m	120		

Source: Poland case study

these have been simplified. In Poland, the 2004-06 scheme differentiated seven types of grassland management and by far the greatest uptake was for meadows cut twice a year, which required least change to existing practice. Management requirements and payment rates were simplified significantly for the 2007-13 programme (as shown in Table 5.4), which

has meant a loss of capacity in the entry-level scheme to differentiate management by type of semi-natural grassland.

5.5 Factors influencing uptake of entry-level agri-environment schemes

The uptake of the entry-level agri-environment schemes in the case studies varies enormously, from insignificant to more than 90 per cent of all farmers in one Member State. Many different factors influence farmers' uptake of the entry-level agri-environment schemes studied here. The most positive effect on uptake seems to be a combination of management actions that fit easily into the existing farming system and payment rates which farmers regard as adequate, although there are examples of successful schemes with low payment rates. In some cases the contribution of multi-annual payments to sustaining farm income may also be a significant factor, especially for extensive livestock systems. Negative influences on uptake include inadequate payments rates, alternative economically attractive uses for the land, management actions perceived as a risk to the farming system, lack of technical capacity or understanding on the part of the farmer, and institutional problems in scheme delivery. Examples of these influences are considered here, followed by a discussion of the importance of uptake of entry-level schemes in the wider policy context.

5.5.1 Agri-environment management requirements within the context of the farming system

One of the common and perhaps defining characteristics of successful entry-level schemes (in terms of uptake) is that they fit well with management that is already in place, or can be adopted without significant change to the running of the farm. In some cases this effect apparently overrides the influence of payment rates, irrespective of whether these are perceived as attractive or as insufficient.

Farmers' differing responses to agri-environment options taking land out of production

In the UK farmers seem to be more willing to undertake agri-environment management options which do not apply to productive land, especially if these are easily managed and have a low impact on productivity. This can be illustrated by the example of buffer strips in England. There was considerable resistance to the imposition of the GAEC standard on protection of hedgerows and watercourses that required a strip of two metres from the centre of the hedge or watercourse to be left uncultivated, even though the amount of productive land and yield likely to be lost was very small, once the width of the hedge is allowed for plus the low productivity of land at the very edge of the field. Despite this resistance, buffer have proved to be a popular choice, particularly on arable farms, because no changes are required to the management of the productive part of the field, and the land taken out of production is understood to have a low yield potential. Buffer strips are a much less familiar concept in Poland, and experience has been very different. Uptake was poor in the 2004-06 programme, and payment rates for both riparian and non-riparian buffer strips were increased by around 70 per cent, to €574 per hectare and €521 per hectare respectively, for the current programme; despite these higher payment rates, now set at 100 per cent of the net costs, uptake has dropped still further to negligible levels, just 142 km of riparian buffer strips by the end of 2010. One of the reasons seems to be that farmers regard buffer strips as a completely new activity[58], additional to their routine management.

[58] Source: interviews with farmers, Poland case study.

There is also poor uptake of grass buffer strips in Bulgaria where, according to government advisors, payment rates of €27 per hectare are too low and farmers are not interested.

A very different response has been seen in Finland, where almost all farmers already participate in the entry-level scheme, and a combination of flexible management, payment rates and ease of implementation has contributed to the initial success of a new scheme to take arable land out of production (Box 5.5).

Box 5.5: Success of a new scheme taking arable land out of production in Finland

This is a new, compulsory scheme for 'nature management fields' on arable land within entry-level agri-environment contracts, aimed at resource protection and biodiversity, which was introduced nationally to counteract the expected adverse effects from abolition of CAP set-aside. In comparison with the preceding CAP set-aside, the scheme has a clear environmental target, a requirement to apply it to least 5 per cent and up to 15 per cent of the arable land area, and improved management for biodiversity.

Famers can choose from two main options: *long-term grassland* with up to 20% legumes, which is not fertilised but may be used for fodder and must be mown at least once every 3 years (the bioenergy reed (*Phalaris arundinacea*) is an alternative to grass); and *three types of biodiversity field,* sown with one of three seed mixtures containing either low-competitive grasses and meadow plants, game food or amenity species to provide resources for wildlife as well as landscape benefits. These may not be used for fodder. Payments are substantial (€170/ha or €300/ha) compared to the other compulsory entry-level measures (€94/ha).

The measure has been very popular with farmers with participation rates in mainland Finland of 5.9 per cent in 2009, 7.4 per cent in 2010 and 6.6 per cent in 2011. The factors contributing to the success are low cereal prices with high production costs, the payment rate, flexibility in management requirements (mowing only once in three years, no biomass removal required) and the possibility of using the mown biomass or grazing the land. The clear environmental outputs of the measure (including improved soil conditions) have been quoted as incentives to join (Herzon *et al*, 2011).

Most of the parcels enrolled in this scheme are former set-aside land or fields of low fertility, awkward size or situated far from the farm (Mäkinen *et al*, 2010). About 40 per cent of all the land entered was existing grassland or former set-aside and about 50 per cent were established after cereals (from a sample of about 100 fields) and only one reported use of fertilisers at establishment (Herzon *et al*, 2011). Thus the actual income forgone is likely to be considerably lower than that estimated for the payment calculation which assumed that farmers would convert cereal fields into the nature management fields. In the words of one of the farmers, this measure is the best since EU accession, being 'beautiful and useful' (Herzon et al, 2011). However, the situation may change drastically with the changes in cereal prices or with a possible shift of some of the fallowing obligation into the reference level (pers. comm, Ministry of Agriculture and Forestry).

Uptake of entry-level management in arable cropping systems

Agri-environment options for arable farms seem to have better uptake if there is an element of synergy with the cropping system. In England (UK) options that involve adjustments to

the productive part of the field are generally characterised by low uptake, even though these are in many cases likely to be the most environmentally beneficial (eg Vickery *et al*, 2008). An exception in terms of uptake is the entry-level option for stubble management which is part of standard crop rotations on many farms, but levels are still lower than those needed to reverse the decline of farmland birds for which this habitat is important (Gillings *et al*, 2005). Current efforts In the UK to improve the environmental impacts of ELS are focused on farm-level targeting of entry-level actions through the provision of more advice and support for those entering ELS (see Chapter 7 for details).

In Poland, the two in-field arable schemes for winter catch crops after cereals have quite good uptake, resulting in a significant increase in land under green cover in winter, despite the fact that payment rates have been reduced both in rates per hectare and proportion of net costs covered (now less than 60 per cent); crucially these schemes are seen to fit well with other farm management[59]. Similarly, farmers in Lombardia (Italy) regard payment rates for the scheme for nutrient planning and crop rotation as insufficient for the requirements, yet this is the most popular scheme after integrated crop production. In contrast the arable cover crop option In Lazio (Italy) has had no uptake, partly due to low payment rates, but also because it is seen by farmers as a high risk in that it may affect the timeliness of planting the following crop.

In some cases it can be specific details of the management actions which cause farmers to reject agri-environment opportunities. In Campania the option to improve soil organic matter has been implemented on just 0.2 per cent of the region's arable land, and the main reason for this failure is farmers' lack of confidence in quality of the organic fertiliser supplied by external firms. The certification of the fertiliser is seen by the farmers as insufficient to guarantee safety standards and avoid possible contamination in the food chain (and poor experience with the waste management in Campania might have amplified the problems with such products). Elsewhere farmers' concerns about management actions have not affected uptake. In the Czech Republic farmers in the extensive pasture management scheme complained that it was too complicated to observe nitrogen limits by calculating the nitrogen deposited by grazing animals and then adjusting the stocking rate accordingly, but this did not seem to affect uptake of the scheme. In Finland it was feared that a fairly substantial reduction (for the current RDP) in the maximum allowed levels of arable fertilisers for the entry-level agri-environment scheme would have a profound effect on the farmer participation. In reality, the changes may have restricted the entry of a few farmers with particularly large amounts of manure per arable area available for spreading, in a region specialised in intensive dairy. However, this was not a common phenomenon and did not affect the participation rate on a national scale.

In the Czech Republic the objectives of the scheme for soil and water protection seem to be well understood by farmers, but an important factor in their decision to participate is the opportunity cost of converting arable land to extensive grassland for several years, preventing them from using it for potentially more profitable crops.

[59] Source: interviews with experts, Poland case study.

Grassland scheme uptake linked to the economic sustainability of extensive livestock systems
In the case of entry-level schemes for extensive grassland management, the contribution to farm income may be a factor in uptake, especially where an existing extensive livestock system is economically marginal and potentially at risk of change which would lead to loss of environmental benefits.

In Poland the most popular scheme in both RDPs has been extensive grassland management, seen by farmers as an incentive to maintain extensive livestock production rather than intensify or abandon semi-natural grassland; by the end of 2010 this scheme was implemented on 18 per cent of the land and 57 per cent of the farms in agri-environment schemes[60], spread across almost all the grassland areas of Poland. In the Czech Republic the schemes for extensive management of pastures and meadows have changed little between programme periods, and both have exceeded target uptake. Success is attributed to achieving the right balance between prescriptions demanding change in farm practices and payment levels; also the security of income from extensification compared to market uncertainties has made the schemes attractive. An additional factor is that meadow management is rather simple and farmers understand better the objectives of this grassland scheme than those of the more targeted higher-level schemes (Prazan, 2011). Some farmers perceive this agri-environment scheme as another form of income support, conditioned by some management prescriptions and cross-compliance requirements. In the Czech schemes payments are not degressive, and large farms with hundreds or thousands of hectares of grassland may be encouraged to apply because economy of scale makes it possible to convert even a small gross margin per hectare from extensive production into worthwhile income. There are no signs of differences in uptake by farm type (other than by farms converting to specialised grazing), but research suggests that although around 380,000 ha of HNV grassland habitats within protected areas or designated Natura 2000 sites are managed under higher-level schemes, a significant area (approximately 170,000 hectares) of grassland habitats of similarly high quality, but unprotected, are in most cases managed only under these entry-level schemes.

The profitability of alternative land management options is also likely to affect uptake. In France evaluation studies suggested that the extensive grassland schemes have mostly maintained existing practices, but no counterfactual modelling was done to confirm this. Other observers point out that farmers who left the PHAE grassland scheme were attracted by arable cropping and intensification of livestock breeding, and that the existence of this scheme probably slowed down this process.

Campania is one of the few regions in the Central-Southern Italy that implements an option for extensive management of permanent pasture, and the good level of implementation (27,000 hectares in 2009, 10 per cent of the regional grassland) is clearly linked to the high level of payments, which are on average two or three times more than in the Alpine areas. The maintained pasture is generally quite dispersed but there are also some farmers for whom the agri-environment payment was an incentive to set up a new livestock farm. Regional officers argue that the payment level is justified when farmers apply for contracts

[60] At the end of 2010. Source: Agency for Restructuring and Modernisation of Agriculture, the paying agency in Poland.

in areas subject to abandonment. In these areas there is no alternative agricultural land use and shepherding is not an attractive occupation. In Scotland (UK) the relatively high level of uptake of the option for summer cattle grazing, despite the very low payment (only about a sixth of that for the mixed stocking option in England), suggests that where cattle are already present on the farm, significant changes may not be required in existing management. Where cattle are not present on the farm, it is unlikely that the low levels of incentive payments will motivate farmers to acquire them. The impact of these options therefore is most likely to be to encourage the maintenance of cattle grazing where this already exists[61].

5.5.2 Capacity of the farmer and farm business

There is some evidence that the capacity of the farmer and farm business (in terms of technical knowledge and understanding, administrative ability and cash flow) can have an effect on uptake. For example in Poland the entry-level scheme for sustainable farming (arable extensification) is relatively successful, with participation by 18 per cent of the farmers on 28 per cent of the land in agri-environment schemes[62]. Research by Niewęgłowska (2009) showed that farms in this scheme tended already to have good agricultural management, could afford the necessary investment and would perceive the payment rates as more than covering their additional costs. Other studies showed that this scheme is implemented in the areas with lower than average levels of permanent grassland (the payment applies only to arable land) and where the risks of soil erosion are low (Filipiak and Duer (2009), Niewęgłowska (2006)). This would help to explain why much of the uptake has been in Northern Poland in areas dominated by intensive agriculture and large farms. It is possible that the capacity problems may affect certain groups of farmers more than others. Research on entry-level implementation in the 2004-06 period in Poland noted the low level of environmental awareness of farmers and problems with documentation Golinowska (2006), and interviews with farmers undertaken for the ex-post evaluation of that RDP (MARA,2009) showed that 23 per cent of agri-environment beneficiaries found the documentation too difficult.

The problem of high upfront costs at the start of an agri-environment contract is discussed in section 5.3.1 in the context of payment calculations for the Bulgarian HNV grassland scheme. There is some evidence that similar unevenness of expenditure may affect the Czech Republic scheme to convert arable land to grassland, where uptake seems to be constrained by the need for significant expenditure on specified seed mixtures at the start of the contract, which has an adverse effect on cash flow[63].

The role of support services in the delivery of entry-level agri-environment schemes is discussed more generally in Chapter 7, but there is evidence that some entry-level schemes already use site-specific technical advice of a type more usually associated with higher level

[61] Source: UK case study.

[62] At the end of 2010. Source: Agency for Restructuring and Modernisation of Agriculture, the paying agency in Poland.

[63] Farmer interviews, Czech Republic case study.

agri-environment schemes - and that others would benefit from quite basic advice. Technical input from a consultant is required in Lazio to undertake soil analysis and prepare fertilisation and cropping plans, and most farmers have access to some technical support through the farmers' association. Similar input is required in Bulgaria, but withdrawal of free government advice has caused problems (see section 6.2.1 below). Elsewhere on-farm technical support may be necessary, even if it is not specified in the scheme requirements, for example in Scotland where the location of buffer strips has to be determined by a diffuse pollution audit, or In Lombardia (Italy) where there is a requirement to adopt a government defined fertilisation plan. The Italian case study notes that the permanent crops grass cover option in Lazio would benefit from better technical advice to avoid mismanagement by the farmers; this was illustrated when a technical service for nut growers was able to show farmers that the agri-environment management would not limit their cropping system, as they feared. In Campania the potential benefits of a permanent crops scheme is overshadowed by lack of understanding on the part of the farmers who believe that the green cover could be interpreted by the product buyers as bad management of the whole crop, with a consequent negative effect on the price. In addition, competition between crop and grass for water and a slight decrease in the yield of the permanent crop in the first two years makes it difficult for farmers to appreciate the positive effects for product quality and yield in the medium term, in addition to soil protection. The provision of adequate advisory services would be helpful.

5.5.3 Institutional problems with delivery of entry-level schemes

The previous sections considered the effect on uptake of decisions by individual farmers to participate in entry-level agri-environment schemes, but there are examples from the case studies where decisions by the managing authorities or failures in the delivery process have influenced uptake.

The most serious problems are in Bulgaria where a well-designed entry-level programme was ready for the start of the RDP 2007-2013, but almost four years later there was still very limited experience of implementation, and minimal uptake. HNV farmland is a key priority in both biodiversity and agri-environment policy, but decisions by the managing authority on the definition of agricultural land for LPIS and the implementation of GAEC left very large areas of environmentally important HNV grassland ineligible for both SAPS and agri-environment support (see Box 5.6). As a result, by 2009 less than 2 per cent of more than 1 million hectares of HNV permanent pasture identified in 2007 was in agri-environment contracts. Changes have been made to GAEC standards to make it possible for land excluded from SAPS payments to enter the HNV agri-environment scheme, but this has not been reflected in payment rates.

On land which is eligible there have also been problems with delivery and control processes in Bulgaria. The first nation-wide agri-environment scheme opened in 2008 but significant delays in processing applications followed by very long delays in making payments has reduced applications. In 2008, for the HNV1 scheme for undergrazed grasslands of high biodiversity value, there were applications covering 33,927 ha of which 95 per cent were authorized for payment; however within this group were a large number of 'zero' payments, which significantly reduced the number of farms actually supported. No data is provided by the Paying Agency on the level of farmers' compliance with the requirements, but the large

Box 5.6: Targeted HNV grasslands in Bulgaria ineligible for support

The geographical coverage of this basic entry-level scheme for HNV grasslands comprises all permanent pastures identified as HNV areas at the level of agricultural land parcel (LPIS). During RDP preparation in 2007, the total area of these HNV permanent pasture parcels was as much as 1,138,981 ha (RDP version 4, July 2010), but the impact target for this scheme in 2007-13 is 200,000 ha, or less than one fifth of the initially identified HNV permanent pastures.

A statement by the Ministry of Agriculture in the 2009 campaign year stated that the area of permanent pastures defined in good agricultural condition in 2007 was only 738,145 ha, meaning that 400,836 ha of permanent grasslands previously identified as HNV had failed to meet the requirements for SAPS payments. The main reason for this was that the compulsory GAEC standard for protection of permanent pastures included the requirement that 'permanent pastures or meadows must be cleared of unwanted bushes', which meant that, in order to receive the area-based payments, farmers started cleaning shrubs and bushes (sometimes even cutting trees). This led to destruction of some valuable and protected habitats. This GAEC requirement, combined with the large areas of abandoned land (mainly permanent pasture but also arable land) led to problems for land's eligibility for support. Most of this land was categorized as code 6 'other agricultural land' in the Land Parcel Identification System (LPIS), defined as:

'(1) land recognized by the orthophoto map as evidently abandoned arable land (which has not been cultivated for more than 2 years); or

(2) agricultural land, which has not been included in physical blocks with codes from 1 to 5 due to a reason of not meeting the minimum size (bigger than 0.01 but smaller than 0.1 ha)'.

The areas which were in the physical blocks under the famous code 6' in 2007 were excluded from support and farmers were sanctioned for 'over-declaration'. This was relevant for both SAPS payments and area-based payments under Axis 2 measures (especially LFA and agri-environment payments).

In addition to these problems in accessing CAP support, the area of permanent pastures in good agricultural condition was reduced by the Ministry of Agriculture to 435,597 ha in 2009. Surprisingly, this important decision was not discussed at all with the farming community.

These decisions have a huge negative impact on the uptake and participation in the HNV schemes in Bulgaria, and mean that in total there are 703,384 ha of HNV permanent pastures in Bulgaria which have been excluded from SAPS support. By 2009 only 20,336 ha of HNV pastures had been authorised for payment under the entry-level HNV scheme, just over 10 per cent of an already modest target, and only 1.8 per cent of the HNV permanent grassland identified in 2007.

number of reduced and 'zero' payments suggests that there is significant non-compliance. In the case of the scheme for in-field erosion control strips the main factor limiting uptake is believed to be the short application period, theoretically one month, but in practice sometimes less than 10 days.

There are issues of eligibility restricting uptake in other Member States, notably of entry-level schemes for extensive pasture management on common grazing land. In certain parts of Italy such land has been managed for many decades on the basis of annual contracts but these graziers are not eligible for agri-environment schemes, which require a commitment to a five-year contract. Similar problems occur in the UK, where many individual farmers may have legal grazing rights over the same area of common land but neither the individual farmers, nor the owner of the land, has control of the overall management to the extent required by an agri-environment scheme. In the past this inhibited uptake of agri-environment schemes on large areas of environmentally important upland farmland, but the current entry-level schemes in England now offers groups of commoners a 'standalone' contract for the area of the common.

5.6 The wider significance of uptake of entry-level agri-environment schemes

The role of entry-level schemes in the context of other policy tools is to provide an incentive for the majority of famers to undertake environmental management within the scope of their current farming systems, and to act as an environmental baseline for more ambitious agri-environment schemes, in terms both of land management actions and farmer capacity. This raises questions about additionality and deadweight, the level of uptake required and the extent of choice farmers have.

In the England (UK) entry-level scheme farmers have a very wide choice of options and it has been suggested that their preference for agri-environment options that do not require significant change from existing practices reduces additionality and creates a high degree of deadweight (Hodge and Reader, 2010). However, the authors of the MTE of the current RDPs in Scotland (UK) pointed out that: '*care needs to be taken with regard to certain agri-environmental activities where the assessment of what constitutes deadweight is complex e.g. in maintaining an existing management regime*'. The key question is 'what would have happened in the absence of the scheme?' but this counterfactual is not always easy to determine. In a rapidly changing world agriculture must constantly adapt, and maintenance of environmentally favourable management practices that are becoming or likely to become uneconomic may be as valuable in terms of outcomes as instigation of change in management or adoption of new practices. This 'protective' function of entry-level schemes applies both to the existing environmental benefits of marginally economic extensive livestock systems on semi-natural grazing land, where there is risk of abandonment or intensification; and to extensification of arable systems where there are opportunities for conversion to more intensive cropping systems with greater environmental risks.

The appropriate level of uptake for entry-level schemes will depend on the scale and location of the environmental risks being addressed (e.g. soil erosion or abandonment of HNV grassland) but for many of the environmental objectives there are potential economies of scale (e.g. for management benefiting farmland birds or reducing the risks of diffuse pollution) which suggest both a need for substantial uptake and an element of targeting and

differentiation of entry-level management. Ensuring that land management requirements are suited to local conditions and local needs is critical to achieving both additionality and efficient and effective policy delivery.

From the farmers' point of view, when there are frequently changing reference level requirements and agri-environment options, making a decision about applying for an entry-level agri-environment scheme has to be set in the context of other dynamics affecting the farm business, which may also differ from one Member State to another. This 'background noise' includes, for example, SPS historic payments already being converted to regional payments, SAPS payments rising year on year, LFA changes, Article 68 payments, and fluctuating fuel and commodity prices. The dynamic policy context also has an impact on the design and delivery of entry-level schemes, as this study has illustrated. From the managing authorities' point of view, there appear to be rather different problems in achieving uptake between two groups of Member States, those with long experience of implementing agri-environment schemes (or relatively stable schemes and reference levels) and those that are still introducing EU reference level standards, Pillar 1 payments and agri-environment schemes, while their agriculture sector is restructuring. These differences are likely to take considerable time to overcome.

6 THE PROCESS OF DESIGNING, REVISING AND IMPROVING AGRI-ENVIRONMENT SCHEMES

This chapter examines the key aspects of the processes that the case study Member States have adopted for setting up, revising and improving entry-level agri-environment schemes, illustrated by examples of their experiences (good and bad) that would be relevant and useful to inform the design and/or revision of entry-level agri-environment schemes in future. The involvement and role of stakeholder groups in scheme design is also considered, in the context of agri-environment schemes generally, not just entry-level.

6.1 Designing the 2007-13 entry-level agri-environment schemes

In most of the case studies the entry-level agri-environment schemes for the 2007-13 programming period were based on earlier schemes, modified to a greater or lesser extent, although the detail of the changes and the reasons for them differ considerably, as does their level of experience. Finland, France and the UK had relevant experience in designing and implementing entry-level agri-environment or similar schemes over at least three programming periods. In contrast, some of the EU-12 case studies had very little previous experience, especially where there had been problems implementing the pre-accession SAPARD scheme.

For example, although Bulgaria had previous agri-environment design experience, which was used effectively, it had no practical experience of agri-environment delivery to draw upon because the SAPARD pilot schemes were opened to farmers in 2006, when the 2007-2013 programme was already being designed. The four SAPARD pilot schemes formed the basis for the new programme, and most of the actions remained the same or their scope was enlarged (see Table 6.1), but the scheme for the management of semi-natural habitats was substantially modified and renamed. Some of these changes were informed by extensive consultations with NGOs and research institutes, whose input provided useful evidence for the environmental justification of the proposals, both for the management actions and their potential geographical scope.

In the Czech Republic the current agri-environment programme was modelled on the 2004-06 programme, which in turn had been guided by the design and evaluation of SAPARD pilot schemes (implemented on five sites in different protected areas). These had provided useful information on uptake, payment rates, transaction costs, farmers' motivation to join the schemes and their overall perception of the policy. Useful experience also came from national grassland schemes, similar to entry-level agri-environment schemes, which had operated since the 1990s.

In neighbouring Poland, the situation was very different, with large numbers of relatively small uneconomic farms and problems of rural infrastructure and employment. Agri-environment had not been a SAPARD priority, although there was an NGO-run pilot programme as early as 1997[64]. The design of the first national agri-environment programme

[64] The project '*A case study in the Green Lungs Area of Poland'* implemented by a consortium of: IUCN Office for Central Europe and National Foundation for Environmental Protection, Avalon Foundation (NL), Veen Ecology (NL) and the Institute for European Environmental Policy (UK).

Table 6.1: Comparison of the Bulgarian SAPARD pilot schemes and the initial 2007-2013 RDP agri-environment schemes (before modifications during the course of the programme)

SAPARD pilot schemes (2000-2006)	RDP 2007-2013 schemes
Organic farming: • fruit and vegetables; • medicinal plants and herbs • fodder crops	Organic farming: • organic farming of all crops (OF); • organic apiculture.
Endangered breeds of local farm animals: • four breeds	Traditional livestock breeding: • 27 local breeds (LB1); • mountain pastoralism (LB2).
Management of semi-natural habitats: • semi-natural grasslands; • farmed wetlands.	Restoration and management of HNV farmland: • on undergrazed HNV grasslands (HNV1); • on overgrazed HNV grasslands (HNV2); ***these two grassland schemes were combined in 2010*** • on arable lands in IBAs (HNV4).
Support to anti-erosion practices	Soil and water protection: • crop rotation (SW1); • soil erosion control (SW2).
	Landscape features: • maintenance of traditional orchards (LF3).

in Poland was simplified several times before it was launched in 2004, effectively as a pilot scheme implemented only in priority zones with specific environmental problems, covering about one third of the country. For the 2007-13 programme, available throughout Poland, the schemes were revised, reduced in number from eight to seven and significant changes were made to many of the management requirements. Some of these were the result of introducing GAEC cross-compliance standards which meant that management actions that had previously been paid for in the 2004-06 agri-environment schemes were now in the reference level (for example, some crop rotation requirements). Other changes for the new programming period were aimed at increasing the level of participation and simplifying the requirements, as illustrated by the changes to the schemes for extensive grassland management shown in Table 5.4.

Of the EU-15 case studies, France has experience of three programming periods to draw upon, and has made significant changes to its entry-level schemes with each new programme, as illustrated in Chapter 5. The UK also has lengthy experience of zonal and higher-level agri-environment schemes, which had included entry-level actions, but the first separate entry-level schemes available nationally were introduced in 2005. In England the entry-level scheme was piloted in 2003 and the results of this were modelled at a national scale before the scheme design was finalised and launched in 2005. The new programming period provided an opportunity to revise and adjust the entry-level schemes and most of the subsequent modifications have been informed by the findings of an evaluation of the first two years' operation (2005-2007). Scotland took a different route, and in 2005 launched a broad rural development scheme, offering entry-level agri-environment payments alongside other EAFRD measures in a single contract. However there was concern that the aims of the scheme were poorly understood by farmers, and that it did not lead to pro-active agri-environmental management. Following an independent review a new two-

tier scheme was designed for the 2007-13 RDP, still covering measures from all three EAFRD axes, but with agri-environment options at both entry and higher level.

Finland has made relatively few changes to the overall structure of its agri-environment schemes and most of the schemes in the current RDP reflect the basic form of the first programme, designed when Finland acceded to the EU in 1995, although the detailed requirements have been refined, as illustrated in Box 6.1. For the 2007-13 RDP some payment rates were changed, a new scheme to take arable land out of production was added to the list of compulsory management in the basic scheme, and the package for vegetation cover became optional rather than compulsory. Piloting is still rare in Finland, but recently some potential measures for water protection and soil structure have been tested within the TEHO and TEHO+ projects (set up at the instigation of a farming stakeholder group - see Box 7.1), and research is also underway on the efficiency of competitive market-based agri-environment payments, where farmers place bids to enter the scheme.

The experience from the case studies shows that effective pilots before the formal implementation of agri-environment schemes can reduce the need for scheme modifications later (which often require Commission approval and therefore take time to implement), can help to avoid delays in implementation and achievement of uptake, and can be used as a 'test run' of administrative processes not just the management actions. They also provide a valuable opportunity to assess farmers' reactions and to incorporate their practical suggestions.

6.1.1 Evidence base

A solid body of evidence, covering both agronomic and environmental factors and the interaction between them, is an essential basis for designing effective agri-environment management actions and schemes. In addition to their previous agri-environment experience, the managing authorities in the case study countries have used several other sources of evidence to inform the design of entry-level schemes.

In the Czech Republic, for example, data used in designing entry-level grassland schemes came mainly from agricultural statistics (for example on input use, intensity of animal production), farm economic data (especially profitability of cattle grazing and stocking rates) and the Research Institute of Plant Production, who provided expertise on nutrient management and grassland response. In Finland research is an important part of the policy making process and much of it is funded by the Ministry of Agriculture. Here the need to improve the environmental effectiveness of entry-level requirements for fertiliser use has led to new research and monitoring, which was used in the process of scheme revision (see Box 6.1).

Box 6.1: Influence of research on the entry-level scheme for fertiliser reduction in Finland

The environmental priority of the Finnish scheme is water protection from agricultural run-off. The appropriate levels of fertiliser inputs for the entry-level scheme have been the most hotly debated and politically difficult to negotiate of all the management requirements. In the first programming period, the limits were related to economic efficiency, not environmental outcomes. Since then, pressure to improve the environmental performance of the RDP has led to the fertiliser limits being revisited for every programming period and the impacts of different fertiliser levels have been under intensive scrutiny through

research, experiments and monitoring.

The challenging process of shifting the focus of the Finnish entry-level schemes from 'farmer support' to environment-enhancing measures is not yet complete and there is still a serious lack of consensus between the researchers and environmental authorities on the one hand, and the agricultural administration and farmer unions on the other, about the maximum permitted fertiliser limits. At the last round of the negotiations, the key researcher on agricultural nutrient run-off left an official note of dissent about the issue of phosphates in manure (set at 80 per cent of the agronomic optimum), while the farming press claimed that this level would force many dairy farms out of agri-environmental agreements. New evidence that crop yields would not be affected significantly by the lowered limits, as farmers had feared, led to a revision of the 'income-forgone' calculation and the payment rate for the entry-level component for reduced fertilisation of arable crops was reduced accordingly from €40.74/ha to €12.50/ha for the 2007-13 RDP.

It is clear that over three programming periods this scheme has been much improved by the active involvement of researchers in the political process, and the availability of new evidence. In the second RDP (2000-2006) fertiliser limits were set only for the major crop types, but in the current period these are precisely differentiated by crop use, attained yields and major soil types and the latter are further subdivided by soil fertility class for phosphates. Despite these considerable improvements, the scientific community regards the permitted limits for inputs in the agri-environment scheme as still above those required to achieve a measurable improvement in water quality.

In the UK there is a strong focus on both evidence gathering and consultation, although more government resources appear to be allocated to agri-environment research in England than in Scotland (possibly reflecting demographic, budgetary and political differences). The extensive evidence gathering and research which underpinned the development of the first entry-level scheme is described in Annex 8. It is interesting to note that the relative abundance of evidence for biodiversity management techniques on arable land seems to reflect the importance attributed to the UK 'farmland bird index', part of a suite of sustainable development indicators adopted in 1999 and subsequently used as a CMEF indicator.

In Bulgaria the information used in the design of agri-environment schemes was drawn from the state institutions involved in setting up the schemes (ministries, institutes and research bodies) but also, importantly, from the experience of the environmental NGOs. For example, there was no database or experience of organic farming or endangered breeds in Bulgaria outside the environmental NGOs, who provided operational and project data about their farms and related production costs, subsequently used to calculate agri-environment payments. NGOs are currently running a pilot programme of EAFRD measures for HNV farmland in Bulgaria, which could inform the development of measures for the 2014-20 programming period (described in Annex 7).

Limited use of evidence gathered in the CMEF cycle

There are several examples of separate, independent national agri-environment evaluations undertaken (and consequent RDP revisions prepared) in the period between 2007 and 2010, before the Mid Term Evaluations (MTEs) were completed. In terms of providing evidence useful for reviewing and adjusting agri-environment schemes *during* the period of a RDP the formal cycle of Common Monitoring and Evaluation Framework (CMEF) monitoring and evaluation reports seem to have been of limited use, apart from the data collected on the uptake of entry-level options, because evaluation of new schemes was needed much sooner than the MTE. For those EU-10 Member States with limited previous experience (Poland and

the Czech Republic) the formal cycle was even less useful because the first programming period was shorter than usual (only three years) and no mid-term review was carried out to inform the design of the 2007-13 RDP.

6.2 Revising schemes and management actions during the 2007-13 RDP

In EU-12 Member States with limited experience of national agri-environment implementation, such as Bulgaria, there was almost certainly going to be a need to adjust the 2007-13 schemes during the course of the RDP, as problems arose. This is confirmed by the case studies. It is worth noting, however, that some of the more experienced EU-15 Member States have also made frequent adjustments during the course of the 2007-13 RDPs. ,In the UK, for example, evidence has been collected and used to modify prescriptions throughout the life of the entry-level schemes (see Annex 9) and in France the dynamic relationship between changes in the reference level and entry-level prescriptions has meant that changes have had to be made fairly frequently (see Table 5.2).

An examination of the reasons for revisions reveals the almost constantly shifting policy background against which entry-level schemes operate, and the considerable effort in some (but not all) RDPs to improve the environmental 'value for money' of entry-level schemes. No consistent pattern has been observed of revisions to schemes being implemented at the start of a new RDP rather than during its course, and the frequency, type and purpose of revisions also varies considerably between RDPs. Drivers of change include implementation and uptake problems, overlap with regional or local standards and efforts to improve the environmental effectiveness and geographical targeting. In some cases considerable efforts are made to obtain and use evidence to design and improve the effectiveness of entry-level management, although this is not always translated into an effective scheme. Some of the main factors driving revisions (or lack of them) highlighted in the case studies are set out below.

6.2.1 Overlap with GAEC standards and/or national legislation and accepted standards

In England (UK) four options for management plans (soil, manure, nutrient and crop protection) were withdrawn at the start of the 2007-13 RDP because the Commission considered that these were too close to the reference level, with very little added value for the public expenditure[65]. The withdrawal of these management plans was a cause of concern among arable farmers joining the scheme, because they had to find alternative options suited to their farms, as well as for the authorities who had to develop other resource protection options (see Box 6.2). In Bulgaria some requirements were removed because of duplication with national legislation (see Annex 7). In Italy, although there was no duplication with GAEC, integrated crop management is becoming more and more an industry standard for efficient farms, particularly those aiming to increase productivity by rational use of technical inputs and machinery. For this reason a few regions decided to withdraw this support from their RDPs and, in consequence, have suffered a lower uptake rate of agri-environment schemes as a whole.

[65] It was argued by the Commission that manure and nutrient management plans duplicated a forthcoming legislative requirement under the revised Nitrates Action Programme; that there was insufficient distinction between the requirements of the agri-environment Soil Management Plan and those of the GAEC Soil Protection Review; and that the Crop Protection Plan covered what should be good farming practice.

Box 6.2: Two examples of revisions to entry level agri-environment schemes involving desk-based management requirements

In **England**, a study of the potential impacts of the entry-level scheme on resource protection (Boatman *et al,* 2007b) found that nutrient management plans appeared likely to have the greatest impact on nitrogen losses, because these cover the whole farm area and can potentially tackle problems at source. The greatest impact on phosphate losses were thought to be soil management plans and buffer strips on arable land. However, the modelling that underpinned these judgements had assumed that the management identified in the plans was actually implemented, whereas the agri-environment payment was made simply for producing the plans. Management plans were withdrawn from the scheme (as a condition of approval by the Commission), but it was considered that most of the other entry-level options would have limited impacts on water quality. Two revisions were made to address this problem. Firstly, additional management options were offered, including:

- in-field grass areas to prevent erosion and run-off;
- 12m buffer strips for watercourses on cultivated land (wider strips are thought to have greater impact);
- enhanced management of maize crops to reduce soil erosion and run-off;
- maintenance of watercourse fencing; and
- use of winter cover crops (to reduce nitrate leaching and reduce runoff at a field scale).

Secondly, targeted advice was made available through the England Catchment Sensitive Farming Delivery Initiative to help farmers choose and locate the most effective options (see Box 7.1 for details).

In **Finland** a new, controversial desk-based requirement for 'biodiversity mapping' has been added to the basic scheme, with farmers required to identify biodiversity features on a special form and also on a map of the farm, retain these documents and present them to the controlling authorities on request. Opinion was already divided at the planning stage, with some considering it a useful way of raising awareness about features important for biodiversity, and others worried that without any official recognition or requirement for practical management, it would lead to farmers losing interest in biodiversity as a scheme objective. During negotiations an attempt to require farmers to submit the forms, and to add some management obligations, had failed and the scheme was a compromise, unsupported by analysis of the likely benefits and possible side-effects. There was no pilot, but preliminary monitoring results (from MYTVAS-3) indicate that concerns about this new requirement are justified. Interviews with the farmers revealed that most felt that this is just one more piece of paperwork of no value, and some farmers were concerned that identifying biodiversity elements on the farm may lead to protective measures similar to Natura 2000. One interviewee for this study simply asked, 'what good will come if this tree is put on paper?' (pers. comm, ProAgria and Project), and In the most recent round of revisions to the agri-environment programme this scheme was described as "the worst failure so far".

Source: UK and Finland case studies

6.2.2 Implementation problems

One of the most common revisions is to payment rates. For example, changes were made in Lombardia (Italy) in 2010 to take account of additional costs, such as transaction costs not included in the original estimation of income loss, and updated agricultural prices. At the same time the number of crops eligible for payment was widened.

In Bulgaria revisions were needed shortly after the introduction of the 2007-13 RDP in 2008, which was in effect the implementation of the first national agri-environment scheme. These revisions were in response to implementation difficulties faced by the Paying Agency, proposals from the National Agricultural Advisory Service (NAAS) (including opinions of farmers), proposals by environmental NGOs and research institutes working with farmers, and complaints by the farmers themselves. The revisions included:

- introduction or removal of management requirements, usually to improve verifiability and control, as proposed by the technical inspectorate;
- changes to management requirements to improve environmental delivery or make it easier for farmers to understand, usually based on proposals by environmental NGOs, NAAS or farmers' associations; and
- changes to baseline requirements in response to changes in national or EU legislation.

6.2.3 Response to the abolition of set-aside and loss of associated environmental benefits

In two of the case studies there were significant revisions to entry-level schemes in response to the abolition of set-aside in 2009 (as part of the CAP Health Check) and concern about the potential loss of environmental benefits. In Finland a new compulsory element was added to the basic agri-environment scheme, requiring farmers to take at least 5 per cent of their arable land out of production, as described in Box 5.5. In England the following changes were made to entry-level arable options between 2008 and 2010, all for the benefit of farmland birds, intended either to increase the food (seed) supply for birds during winter, or to improve spring/summer nesting habitats:

- wildlife seed mixtures: the area required per farm was increased, and management requirements changed (2008);
- unharvested conservation headlands: management improved (this option replaced unfertilised conservation headlands in 2008);
- enhanced over-wintered stubbles: to follow a spring crop, with delayed drilling dates to provide increased food for birds over the winter (2010);
- skylark plots: the area of each plot was increased (2008);
- fallow plots: a new option (based on research) for larger plots of up to 2 ha, with improved management in spring preceding the fallow, for species other than skylarks such as lapwing and yellow wagtail (2010).

6.2.4 Improving environmental effectiveness

In some case study countries considerable efforts are being made to improve the environmental effectiveness of entry-level schemes by detailed revisions to management requirements and/or more accurate targeting of appropriate management options. In the Czech Republic the scheme for cover crops has been improved by changing the species mix and defining upper and lower limits for the percentage of arable land to be cropped. These changes helped farmers to avoid mistakes in crop rotation and improved the managing authority's financial management. Many detailed changes have also been made to entry-level management requirements in England, as described above and in Annex 8. The Czech Republic is at the forefront of geographical targeting of entry-level schemes, as illustrated in Box 6.3, and in Finland fertiliser limits are now differentiated by crop and soil type, as described in Box 6.1.

Opportunities remain for improved targeting of entry-level agri-environment schemes. In some case studies an emphasis on reaching output targets for total area or budget expenditure seems to have led to prioritising uptake above environmental impacts, despite the introduction of impact indicators within the CMEF. For example, in Lazio there was a 40 per cent increase in agri-environment uptake between 2009 and 2010, mainly due to new

entrants to the schemes for integrated and organic farming. However, the regional administration has not resolved problems with uptake of schemes for soil management and organic content where uptake is low because the payment rates do not reflect net costs at farm level. A similar situation exists in Campania, with a 52 per cent increase in uptake due to integrated and organic farming options, but no plans to improve uptake of the schemes for soil protection. Poland places a strong emphasis on area uptake as a measure of agri-environment success and this has been achieved by revisions that simplify successive schemes, which have helped to achieve overall uptake targets but offer fewer opportunities to differentiate management options to suit differing regional conditions. In a move in quite the opposite direction, the MTE of the entry-level scheme in England recommended *removing* the uptake area target for the whole scheme (set at 70 per cent of farmland in England participating by 2011) and continuing to develop entry-level targeting (including scheme design and spatial targeting). This rather surprising recommendation was justified because the focus on achieving uptake was perceived to reduce the scope for targeting specific management options, and because it was necessary to improve environmental effectiveness more generally[66].

Box 6.3: Progressive targeting of schemes to prevent soil erosion on the Czech Republic

The scheme to establish grassland on sites not suitable for arable farming operated as a national scheme from mid 1990s until 2004 when it became part of the entry-level agri-environment programme. It was targeted at areas of greatest need (arable land in the LFA and arable fields elsewhere with soils vulnerable to erosion, for example on slopes, shallow soils and soils near water bodies). In practice this was not very efficient as fields are rather large in the Czech Republic and many have both steep slopes and flat land. The first step in targeting was to calculate the average slope per field, but this was not an accurate indicator of vulnerability. The next step has been to identify sensitive soils within fields, using detailed maps of soil characteristics developed by the Research Institute of Soil and Water Protection. Farmers can download from the website a detailed map of their fields (based on LPIS) and identify which areas of the field are eligible for the arable conversion scheme (an example of this map is in Table 7.1). This GIS-based approach is regarded as both environmentally and financially efficient, has also been adopted for higher level schemes, and may be extended to other entry-level schemes (for example cover crops) in the next programming period.

6.3 Stakeholder involvement in scheme design and revision

In most of the case study countries, the design and revision of entry-level agri-environment schemes involved one or more working groups representing a broad range of interests. The Bulgarian experience illustrates the process for the SAPARD programme. The Ministry of Agriculture and Forestry established three separate working groups, one for organic farming, another for endangered breeds of local farm animals, and the third for the management of semi-natural habitats and support for anti-erosion practices. The three groups included representatives of different directorates and agencies of the Ministry of Agriculture, Ministry of Environment and Water, research institutes, the executive Environmental Agency and several agricultural and environmental NGOs. The working groups selected the management actions and justified the proposed pilot scheme, and a similar process was used for the 2007-2013 RDP, with all of the activities discussed and agreed in working groups set up by an Order of the Minister of Agriculture. External expertise was used mainly for summarising requirements and calculating payment rates.

[66] Recommendations 214-1 and 214-2 of Defra Rural Development Programme for England 2007 – 2013 Mid Term Evaluation Volume One

Similar groups are used in Finland and the Czech Republic and also in the UK, where formal consultation with a wide range of stakeholders is a familiar process in the development of government policy and was used extensively in the design of the first entry-level scheme (see Annex 9). The processes of involving stakeholders in the design of new entry-level schemes in Finland and Italy are illustrated in Boxes 6.4 and 6.5. Farmers' representatives and environmental NGOs continue to have a significant role in the development of several agri-environment programmes, not just in presenting stakeholder views but, in the case of the environmental NGOs, also providing evidence. For example, in Bulgaria a GEF/UNDP funded pilot in three areas of the country is testing EAFRD measures not yet used in the RDP, and in England work conducted by the RSPB and the BTO on farmland birds has been used to inform the design of management options.

Wider benefits can come from the close collaboration required in working groups developing schemes, notably in relation to the subsequent delivery of the schemes. Participant organisations often provide support and advisory services for farmers, where detailed knowledge of scheme development is likely to be useful. In Finland the level of co-operation achieved between agricultural and environmental interests in the agri-environment process contrasts with the conflicts common in forestry, to the extent that farmers (who are all also forest owners) are reported to have been surprised to find that environmental NGOs were 'on their side'[67]. In some cases the collaboration has led to joint projects between environmental and agricultural authorities and NGOs. The case studies show that, in at least some RDPs, a wide range of stakeholders are involved in scheme design, with on-going benefits of 'social learning' which extend beyond the immediate process. In the example of rice farmers in Italy, efforts to involve the potential beneficiaries as equal partners in the process of design seem to have been particularly rewarding, with high uptake levels of this new biodiversity scheme (Box 6.5).

[67] Finland case study

Box 6.4: Experience of the collaborative scheme design process in Finland

A new scheme for 'biodiversity set-aside' was introduced during the current programming period in response to concerns at the national level about the loss of set-aside and the EU level about the need to strengthen the biodiversity focus of the RDP. The scheme details can be found in Box 5.5.

The MoA had already set up a working group to consider a national fallowing option, and when it was decided to introduce the new scheme a special sub-group was formed of seven members representing the administration, farmer unions, research interests and environmental NGOs. Additionally, the research and environmental NGO group members met separately with other researchers to consider how to design the scheme for maximum benefit to biodiversity. After three months the scheme was presented to the large working group for revision, then to the national steering group for approval and finally, with amendments, it was submitted to the Commission. Positive aspects of this particular process were seen to be:

- shared objectives based on the environmental concerns of all participants, especially in the sub-group devoted to this specific task;
- the intensive work of the sub-group was a learning process for all interests - the researchers had more insight into the modifications that are possible nationally and those that require input from the Commission; the administrators had a clearer understanding of the optimal management for biodiversity;
- informal discussions among researchers and environmental NGOs helped to build up mutual understanding and sufficient influence to achieve what was regarded as a reasonably good scheme;
- some of the researchers had been involved in agri-environment processes for a number of years and hence understood both the opportunities to influence national regulations and the limitations of the EU rules;
- research on the efficiency and potential improvement of the scheme was initiated and funded by the MoA within the first year of delivery.

More general observations on the scheme design process in Finland suggest that it relies on trust and shared objectives which may not always have been in place, but over the years the situation seems to have improved. One perceived problem is that researchers are regarded as an interest group, and their opinion on the minimum requirements to achieve the environmental targets is easily overruled by the majority. As a result, the agreed scheme is always a compromise among many interests and professional groups, which risks scheme design being weakened to the point of nil effect, yet the scheme may still be put into practice (Herzon et al, 2010).

Box 6.5: The benefits of involving farmers in the design process in Lombardia (Italy)

The production of rice involves a large area in Lombardia (about 100,000 ha in the provinces of Pavia, Milano, Lodi and Mantova). Despite intensive cropping, the rice fields can be considered as HNV farmland, because Lombardia has one of the most abundant populations of herons in Europe directly associated with rice fields and stream networks. Scientific studies conducted by University of Pavia demonstrated that during the dry period of rice cultivation there is a decrease in aquatic microfauna, with negative effects on the presence of farmland birds (Longoni, 2010; Longoni *et al,* 2011). The study also showed that changes in farming practices can improve the contribution of rice fields to biodiversity.

In 2009 the Lombardia regional authority decided to design a new agri-environment scheme specifically for rice fields (Carasi and Novello, 2011). Involvement of rice growers was an essential part of the design process, and when the first draft of the management requirements were ready, several meetings with farmers were organised in the most important rice-growing areas. An important role was played by the producer organisation (Ente Risi) which presented the region's new proposal to farmers at these advisory meetings. Nine meetings were held to discuss all the technical aspects of the proposal, with experts from University of Pavia present.

In this way the new agri-environment scheme was designed by a process where the farmers were main actors alongside experts and regional officers. The management requirements of the scheme include creating a water course which is kept fully wet for the whole year; a ditch to provide an undisturbed habitat for bird nesting; and leaving rice straw until the end of February (as a valuable resource for migrant birds). The payment is €125-155 /ha and a minimum 10 per cent of the total area of rice fields must be entered.

The participatory approach seems to have contributed to a high uptake of 11,300 ha at regional level in the first year (2011), and in the province of Mantova 100 per cent of the rice farmers entered this new scheme.

7 FARMER SUPPORT NETWORKS AND FARMERS' ATTITUDES

This chapter explores the role, design and effect of the support networks and services available to the 'target population' of farmers for entry-level agri-environment schemes and considers the effect of participation in entry-level agri-environment schemes on farmers' attitudes to the environment.

Support networks in the context of this study are taken to mean the formal and informal sources and processes providing information, technical advice and assistance to farmers who are eligible for, in the process of applying for or are already participating in agri-environment programmes.

Support networks may be formal or informal, provided by government or by other organisations, free to farmers or paid for by farmers, and may include any of the following:

- For farmers thinking about applying for entry-level schemes: information, helplines, explanation of requirements and how these fit with the farming system, explanation of the eligibility rules and application process, and practical assistance with obtaining information and filling in forms;
- For farmers who have already signed up to entry-level schemes: advice and answers to questions about the land management required, about administration of the schemes, help with compliance problems (eg unforeseen problems caused by weather) and training in environmental land management.

7.1 The context and role of support networks in agri-environment programmes

Networks of support services for farmers were established long before agri-environment schemes existed and it is important to have an understanding of the impact of this wider context on the provision of agri-environment specific support.

The extent, purpose, influence and structure of existing agricultural support services is far from uniform across the EU, but in most situations is provided by a wide range of actors including governments, agricultural research institutes, commercial providers of farm goods or services, marketing institutions and farmers' organisations. These providers have all sought to provide information and often to influence farmers' behaviour or decision-making, but have had very different objectives in doing so, which may differ over time and according to the perceived needs of the target farmers. Providers and their objectives might include, for example, agricultural authorities seeking to promote best practice agronomic and animal husbandry techniques, compliance with regulations or codes of practice, or to improve quality and methods of production. Commercial organisations may sell personalised business and technical advice to farmers or use advisory support as a marketing tool (for example in relation to agro-chemicals). Advisers are frequently mentioned as significant intermediaries between farmers and government policy (Deffuant 2001; Juntti and Potter, 2002; Fish *et al,* 2003; ADAS, 2004; Morris, 2006; Wales Audit Office, 2007). Farmers' organisations also provide a range of support services in the interests of their members and many farmers use informal social support networks too.

The voluntary nature of agri-environment programmes and the impact of agri-environment management on both day-to-day land management and on the farm business mean that agri-environment support overlaps and interacts with many of these other support services, but is unlikely to be met by any one of them alone.

The only common support service covering environmental land management across the EU-27 is the Farm Advisory Service (FAS) introduced into the CAP as part of the 2003 CAP reform. Member States must have a FAS that provides farmers with advice on cross compliance, and can use the service to deliver other types of advice too. An evaluation of the FAS in all Member States, carried out for the European Commission, found that six Member States were using FAS to provide advice on agri-environment management, for example on Natura 2000 in the Czech Republic, water protection schemes in Estonia, agri-environment plans in Hungary and agri-environment scheme requirements in Lithuania (ADE, 2009).

7.2 Provision of farmer support networks

In contrast to the FAS, there is no common structure for the provision of agri-environment support across the EU. The available literature tends to focus on experience in individual Member States and does not necessarily distinguish between provision for entry-level and higher-level agri-environment schemes. Support for the latter is likely to be rather different in nature and needed for a much smaller group of farmers than those in entry-level schemes. A common finding of several reviews across the EU is that advisory systems for agri-environment measures are most effective when supported from both public and private sectors. A recent review of the Environmental Stewardship (ES) scheme in England (Smallshire *et al,* 2011) notes that the English policy and advisory infrastructure has a 'constructive working partnership' between the government and the voluntary sector that is effectively able to support agri-environment beneficiaries (also see Evans *et al*, 2002). In contrast, the situation regarding the provision of agri-environment advice in Hungary is not seen in a positive light. A recent review of the implementation of the Hungarian agri-environment schemes (both entry-level and higher-level) criticises the use of a single government body to organise all training and advisory support. Furthermore, this review shows that, in the opinion of the stakeholders interviewed 'the monitoring, training and advisory services' were felt to be the second worst feature (after the IT system) of the recently implemented agri-environment programme (High and Nemes, 2011).

Farmer groups can provide mutual support when undertaking new initiatives, including environmental projects, and the benefits of farmer networks and liaison have long been recognised as an important means of helping to improve the acceptance of the need for and encouraging the implementation of environmental management (Garforth, 2003; Dwyer *et al,* 2007; Posthumus and Morris, 2010). In the Netherlands environmental cooperatives support groups of applicants for agri-environment schemes; the benefits for farmers include reduced transaction costs and a greater awareness of agri-environment issues, and for government these cooperatives provide a single point of contact for dissemination of information and improve the quality of applications (Franks and McGloin, 2006).

Farmers' attitudes and their performance in agri-environment implementation may respond to feedback on the positive outcomes of agri-environment management, and an element of

self-assessment. Evaluations of agri-environment schemes in the UK and Germany have shown that farmers valued feedback and recognition of their achievements (Oppermann, 2003; ADAS, 2004; Wales Audit Office, 2007; Ingram *et al,* 2009). This is particularly important when benefits are not necessarily observable to the non-expert (Dwyer *et al,* 2007). In Baden-Württemberg (Germany) there has been some success in developing a self-evaluation system of ecological performance where farmers are involved in assessing the biodiversity impacts on their own farms (Oppermann, 2003).

In the case study Member States some of the entry-level agri-environment management actions specify farm-level input from specialist advisers, for example in preparing cropping and nutrient management pans or assessing soil erosion risks. Although this is a concept more usually associated with higher level schemes it seems to be quite important in some entry-level schemes targeted at a wide range of farmers (Finland) or vulnerable areas (NVZs in Italy). Others commented that improvements were needed to extension services to improve both farmer compliance and understanding[68]. In seeking widespread uptake of entry-level type management there may, to a certain extent, be a trade-off between public expenditure on payments to farmers and public expenditure on extension and advisory services closely associated with the delivery and effectiveness of the agri-environment schemes.

The range of different support services provided in five of the case study Member States is considered below, followed by examples of good practice and a summary of the characteristics of effective support networks.

7.2.1 Bulgaria

The implementation of CAP support in general and agri-environment payments in particular is still a rather new experience for Bulgaria and the role of advisory services and other support networks is a very important and sometimes critical part of the implementation of the agri-environment programme, which consists entirely of entry-level schemes.

The support provided to farmers applying for and/or implementing entry-level agri-environmental actions in Bulgaria can be divided into five major groups:

- Information campaigns, guidelines, leaflets, brochures and other publicity materials, prepared and implemented both by government institutions and NGOs with the support of the RDP technical assistance measure and/or other donors;
- Specific application information provided by the regional offices of the Ministry of Agriculture and the Paying Agency;
- Support offered by the National Agricultural Advisory Service;
- Support offered free of charge by different environmental NGOs; and
- Support by private consultants and/or organisations charging for their services.

Theoretically, the flow of information and support for farmers is assured from all possible sources, with national and local agricultural administrations as well as national and regional

[68] Italy case study.

advisory services all providing information and advice about the available support. In practice, however, experience during the current implementation period has been mixed.

The effectiveness of Ministry of Agriculture information campaigns, guidelines, leaflets, brochures and other publicity materials was hampered by poor timing of events, shortage of materials (only 10,000 copies of the agri-environment guidelines were published in 2009) and problems in updating information and documentation as rules changed. In contrast, the seminars organised by NGOs, farmers' organisations or municipalities were usually more tailored to the specific needs of the farmers in a certain region, focussing on their priorities. The most accessible information source for most farmers is the free information on all support schemes or policies which the municipal and regional offices of the Ministry and the Paying Agency are expected to offer. However, problems resulted from the lack of co-ordination of agri-environment information, and led to confusion amongst farmers who received different responses to their questions from different offices.

Since the mid 1990s Bulgaria has had a well structured public extension service, the National Agricultural Advisory Service (NAAS), which has 28 regional offices providing a broad range of advisory services in the agricultural sector, although in recent years the staff numbers have been reduced. Since 2006 NAAS staff have been trained continuously on agri-environmental issues and, until recently, provided a free service to farmers, preparing the full set of applications and required attachments for agri-environment activities as well as offering advice on implementation of GAEC standards, a pre-requisite for participation in agri-environment schemes. This agri-environment advisory service was provided by NAAS free of charge for farmers until September 2010, using EU co-financing[69]. The mid-term evaluation of Bulgarian RDP 2007-2013 showed that between 68 per cent and 78 per cent of the agri-environment beneficiaries were supported by NAAS and that almost 71 per cent of the respondents to a farmer survey considered the support of NAAS as useful or very useful. The MTE recommended that the free-of-charge agri-environment support services should be extended for a further period after September 2010, but this recommendation was not taken up by the Ministry.

In Bulgaria there is a large number of environmental NGOs whose priorities are focussed on nature protection and conservation, and whose projects are supported by EU funding or other donor organisations. Some of these NGOs have branches/offices in key biodiversity areas in the country and where they are involved in the promotion of agri-environment management they usually provide the main support for farmers in that area. This covers not just the application and implementation process, they also act on behalf of the farmers in exchanges with the MoA or the paying agency. One of the best examples is the support offered by the mobile advisory teams of an NGO project for protection of grasslands in two

[69] As new Member States Bulgaria and Romania implemented an EU co-financed measure for the provision of farm advisory and extension services to agricultural producers intending to apply for EAFRD support under measures 141 (Supporting Semi-Subsistence Farms Undergoing Restructuring); 112 (Setting up Young Farmers); 142 Setting up Producer Groups; and to farmers intending to apply under Measure 214 Agri-environmental payments. (Measure 143 of Regulation (EC) No 1974/2006 as amended by Regulation (EC) No 434/2007

Important Bird Areas (IBAs) and Natura 2000 sites - Ponor Mountain and Besseparski Hills (see the Box 7.1 in section 7.3 below).

Farmers' associations are not significant providers of agri-environment support in Bulgaria. Support from private consultants and organisations is also very limited, mostly due to the fact that there is no public payment to subsidise the use of their services. Unlike public institutions such as NAAS (until recently) or NGOs who can finance these activities under projects, private consultants rely on a direct payment from farmers.

There is an agri-environment scheme requirement in Bulgaria for farmers to participate in training during the first two years of their agri-environment contract, but this has not been implemented and the deadline was prolonged several times, because the provision of free training to farmers, funded through the vocational training measure under Axis 1 of the EAFRD, was not implemented until 2010.

The experience highlighted within the Bulgarian case study suggests a number of conclusions in relation to the provision of advice and training to farmers. These are as follows:

- Farmers rely upon and feel most comfortable with information and support provided by the governmental institutions that are geographically closest to them;
- Where the support role of local and regional offices of the Ministry and paying agency was under-resourced, agri-environment implementation suffered seriously;
- At national level, the most effective agri-environment advisory support has been provided by the NAAS, but it took them at least two years to gain sufficient expertise and experience to be fully effective;
- Withdrawal of the free-of-charge NAAS support to farmers is a missed opportunity to increase agri-environment uptake and achieve environmental objectives nationally (and also a significant underuse of agri-environment capacity that has been built up over time within a governmental institution);
- the role of environmental NGOs is quite important locally, especially in areas of biodiversity conservation importance, providing both administrative information and support for farmers addressing specific practical issues on their farms; and
- agri-environment uptake is much higher and farmers feel most satisfied in regions where there is a good cooperation and interaction between the different governmental institutions and NAAS advisors.

7.2.2 Czech Republic

Farm structures are polarised in the Czech Republic, with more than 70 per cent of the land held by less than four per cent of the farms as large units ranging in size from 500 ha to more than 2,000 ha. Until the 1990s these farms were industrial units with university-educated managers, usually a minimum of three or four per farm, specialising in plant production, animal production, machinery and economics. Knowledge transfer in the sector was based around research by specialist institutes published in scientific articles and studies, which were disseminated directly to farms. Since this state network vanished in the 1990s there has been something of a gap in the dissemination of agricultural knowledge generally.

Currently knowledge transfer relies mainly on the centralised state websites of the Ministry of Agriculture, the Paying Agency and the Institute of Agriculture Economics and Information (UZEI). The latter organisation not only runs specialised websites for farmers, but also provides certification for private advisers. Information provision is not restricted to particular farmers or geographical areas and there is no separate advisory service or other form of information provision specifically for entry-level schemes. Most of the support network is common to all agri-environment schemes, and only a few additional organisations (usually NGOs) deal with the more targeted schemes.

One of the most important tools for farmers applying for entry-level schemes (and agri-environment management in general) is the web-based Land Parcel Identification System (iLPIS) providing a wide range of spatially differentiated information (see Box 7.1 below).

In terms of the process of applying for entry into agri-environment schemes, farmers usually source initial information from websites at the regional offices of the Ministry of Agriculture (where booklets are available) and at seminars. At the Institute of Agricultural Economics and Information there is helpdesk offering a state-funded individual question and answer service which is free of charge. Application forms are filled in either without help (large farms usually have their own trained specialist) or farmers can obtain help at the regional office of the Ministry of Agriculture (free) or from a private advisor (charged). When the agri-environment contract is up and running, on-going support is available from the regional office of Ministry of Agriculture, or on some matters directly from the central Ministry of Agriculture (both free). Although some farmers may pay for advice it is understood that private advisers are not used by many farmers.

In assessing the effect of support networks in the Czech Republic, it should be noted that there are substantial differences between large corporate farms with well-educated managers trained to deal with government policies and small family farms with limited human capital (a lack of capacity or training or both). For the first group and the more advanced family farms, the provision of website information may be sufficient to enable them to apply for the entry-level scheme and to run the contract successfully. Smaller farms with limited human capital, however, are more likely to have difficulty in dealing with websites or in understanding the information on rules and management prescriptions provided at seminars or in booklets. In this case private advice could be helpful but is not sufficiently used[70] However, the application process for entry-level schemes is regarded as relatively simple and support is provided, although the case study highlighted the fact that the quality of assistance varies between regions and the capacity to provide advice in these offices is limited. As a result some of the offices focus more than others on family farmers (Prazan, Majerova, Kapler 2010). One study in the Czech Republic has shown that the lack of closer links with advisors and the lack of trust between farmers and state administrators has led to misunderstandings among farmers about the purpose of the agri-environment programmes and thus of the entry-level schemes too (Prazan, Majerova, Kapler 2010), although this does not appear to have reduced levels of uptake or compliance.

[70] Czech Republic case study

7.2.3 Finland

In Finland entry-level agri-environment schemes have a high level of uptake and are generally well catered for by support services. These are mainly state-funded and provided centrally through the Agency for Rural Affairs and regionally by Centres for Economic Development, Transport and the Environment. Farmers know about the opportunities for entry-level agri-environment payments, the options available and management required.[71] Farmer to farmer information flow is also likely to be good, since almost all farmers participate in the schemes and have experiences to share. In contrast, information on the higher-level agri-environment schemes, which until 2010 were administered by the regional environmental authorities, has been more difficult for farmers to obtain, and the quality of advice and regional uptake have both varied considerably. The recent merger of the previously separate regional environmental and agricultural is expected to improve the coherence of support for higher-level agri-environment schemes. Apart from regular advisory events, they also run campaigns and projects on various agri-environment topics, and these usually include free advice.

The highest available quality of professional support is considered to be offered by the commercial, albeit heavily subsidised, advisory service ProAgria. However, this company only provides advice to those farmers who ask for it and are willing to pay, which greatly restricts the number of farmers using this service. The advice is targeted largely at the production interests of farmers and at key environmental issues for which there is a demand from farmers, such as reducing nutrient run-off.

For the first programming period in 1995-99 the scheme included a compulsory training day (on agri-environmental objectives, structure, and requirements). The farmers disliked the compulsory element, there were some logistic difficulties and the training requirement was dropped from subsequent programmes. Some observers argue that it should be reinstated because it was extremely beneficial in teaching farmers something about environmental issues, but if this were to happen in future the training would have to be of more practical relevance to the farmers.[72]

7.2.4 Poland

In Poland there is an effective network of farmer support but the biggest problem has been ensuring the effective flow of information from the managing authority through this network to individual farmers. Information about the agri-environment programme in general and more detailed information on implementation is available to interested farmers from a wide range of sources, in different forms and at several administrative levels (Table 7.1). Farmers might receive information from several different sources but practical assistance with implementation is provided mainly by the paying agency[73] and by specially trained agri-environment advisers in the extension service, who are the frontline contacts for farmers. At the end of 2010 there were 1,819 agri-environment advisers preparing

[71] Finland case study

[72] Finalnd case study

[73] Agency for Restructuring and Modernisation of Agriculture

64,750 individual agri-environment contracts (an average of 40 per adviser). During 2010 a total of 20,000 new agri-environment contracts were registered. The most frequently chosen schemes under these plans were for extensive meadows and pastures (14,800 plans), water and soil protection (14,400 plans) and sustainable agriculture (6,500 plans)[74].

The biggest challenge faced by advisers in Poland was simply to obtain accurate and up-to-date information about the agri-environment programme and the compliance requirements at farm level. On-going changes in national regulations, application dates and scheme requirements, together with re-allocation of funds created significant challenges for advisers trying to provide an effective information and advisory service for farmers.

Table 7.1: Sources of information and advice for farmers about agri-environment schemes in Poland

Information source	Administrative level		
	National Poland	Regional Province	Local Community
Ministry of Agriculture	x	x	x
Agency for Restructuring and Modernisation of Agriculture	x	x	x
Other agencies and institutes of Ministry of Agriculture	x	x	
Regional and local authorities		x	x
Extension service		x	x
NGOs (environmental, farmers' associations, etc.)	x	x	x
General media	x	x	x
Science and education	x	x	x
Commercial companies			x
Informal farmers networks, including internet	x	x	x

7.2.5 United Kingdom

The RDPs in England and Scotland offer an interesting contrast in the provision of government support services for applicants to entry-level agri-environment schemes. In addition, in England a new agri-environment support network has been initiated by the main farmers' organisations under the auspices of the Campaign for the Farmed Environment.

Support services for entry-level agri-environment applicants in England

Before the introduction in 2005 of England's entry-level Environmental Stewardship (ELS), scheme farmers had been accustomed, during the previous 18 years, to agri-environment schemes which included both entry-level and higher-level actions and offered integrated on-farm support from specialist government advisers. However, initially ELS was a 'hands-off' scheme with no provision of on-farm one-to-one advice by the responsible managing authority. This was a significant change for farmers, and the original handbook describes the approach adopted:

> ***"Will help be provided to understand the scheme and complete my application?***
> *We hope that enough information is provided in this handbook to enable you to complete your application. RDS, and other organisations, will also be holding Environmental*

[74] Information from National Centre for Extension Service [2011]

Stewardship (ES) meetings and other events to explain the scheme and to provide advice on applying. In addition, you will be able to contact advisers at your RDS[75] office who will be able to help with general enquiries. If you wish to attend an ES meeting you should contact your RDS office for the location of venues and availability of places. RDS contact details are provided in appendix 6 of this handbook."

An initial evaluation of the implementation of Environmental Stewardship obtained information from agreement holders about their sources and use of advice (Boatman *et al*., 2007). Only around 60 per cent of applicants completed applications themselves and a similar proportion sought advice when completing their application. The main sources of support were independent consultants and land agents, with FWAG (Farming and Wildlife Advisory Group[76]) also used by a number of respondents. Around half of ELS applicants attended meetings organised by Defra, and just under 30 per cent attended meetings held by other organisations (mainly FWAG and the National Farmers' Union). Telephone advice was also frequently sought but the website was less popular as a source of information (only 19 per cent of applicants used it).

This evaluation highlighted the importance of advice to ELS applicants and recommended that, if possible, the provision of advice should be extended and improved, particularly to improve the environmental effectiveness of the scheme. A number of possible measures were suggested, including more active targeting on a regional basis and promoting different options in different regions through the provision of advice. Evidence from other studies also highlighted the potential value of advice. For example, a study looking at training and advice for agri-environmental management reported that a number of the farmers interviewed found implementation of ELS options difficult and welcomed the opportunity to receive advice and training (Lobley *et al,* 2010).

The findings of this initial evaluation informed a Review of Progress of ELS, completed in 2007. The need for greater availability of advice to assist applicants in making informed choices was accepted by Natural England (the current delivery agency), which has introduced free advice through the Land Management Advice Service (LMAS), a Natural England in-house programme and from 2010, the ELS Training and Information Project (ETIP) which offers free workshops, one-to-one farm visits, farm walks and other events run either by government advisors or external contractors. Much of this training and information is funded through Axis 1 (measure 111) of the RDPE and is aimed at improving both farmers' choice of management options and their implementation. During the year April 2010 to March 2011 there were 18,680 new agri-environment contracts and nearly

[75] RDS refers to the government's Rural Development Service, which was responsible for agri-environment delivery at the time.

[76] FWAG was an independent Registered Charity established and overseen by farmers which operated throughout England, Wales and Northern Ireland (and formerly Scotland), to provide environmental and conservation advice to farmers. It was a major source of advice for 'classic' agri-environment schemes and provided advice on Environmental Stewardship. Initially this mostly concerned HLS, as funding was available for advisory support, but this was extended to ELS through ETIP (see below).

20,000 advisory contacts were made[77]. The ETIP programme has been more active in providing one-to-one visits, while LMAS has made more contacts through group events.

Support services for entry-level agri-environment applicants in Scotland
At present there is no provision of on-farm advice or a dedicated advisory network for the entry-level scheme in Scotland, in contrast to the service provided in England. The entry-level scheme Land Managers Options (which combines measures from all three EARD axes) has remained a 'hands off' scheme, with support confined to the guidance booklet, information from the government website and a telephone answering service. The guidance booklet advises farmers that *"our staff can only give you general guidance, not specific business advice. If in doubt, ask a professional adviser for help"* and refers the reader to a website with up-to-date details of the scheme options. Despite the lack of entry-level advisory support for LMOs, a survey carried out for the RDP mid-term evaluation indicated that levels of satisfaction among applicants are relatively good, compared to the higher-level scheme. The entry-level scheme scored around 3.5 out of 5 for relevance, quality and accessibility, for various aspects of the application process, and for support provided (Rural Development Company Ltd, 2010).

The government's conservation agency, Scottish Natural Heritage, does fund some advice, mainly targeted towards higher-level agri-environment management of Natura 2000 sites and species. It also provides more general advice, for example a two-year campaign of advice on management for arable wildlife[78]; produces publications such as a poster on '*How to enhance the value of field boundaries for wildlife*'; and provides links to other sources of advice such as environmental NGOs[79]. Advice is available from professional advisory bodies such as the Scottish Agricultural College (SAC)[80], and other consultants, but farmers need to pay for this and the costs are subsidised only for the higher-level scheme, Rural Priorities.

The Campaign for the Farmed Environment in England
Following the abolition of set-aside, concerns in England over the potential loss of environmental benefits led to a government review of alternative options (Curry, 2008) and a proposal for a new GAEC standard, requiring farmers to manage a certain proportion of their arable land in environmentally beneficial ways to recapture the benefits of set-aside. This government proposal was not implemented, but the farming industry's alternative proposal for a voluntary Campaign for the Farmed Environment (CFE) was accepted by the Minister on the understanding that the regulatory route would be followed up if the voluntary approach did not work. CFE is a joint promotional and advisory initiative by the agricultural industry[81], Defra, Natural England and non-government stakeholders, partly funded by Defra (CFE, 2010). Its objectives include encouraging farmers to undertake

[77] J. Marsden, Natural England, *pers. comm.*

[78] http://www.snh.gov.uk/land-and-sea/managing-the-land/farming-crofting/advice-demo/

[79] http://www.fwi.co.uk/Articles/19/11/2011/130185/FWAG-closure-means-120-jobs-could-go.htm

[80] http://www.sac.ac.uk/consulting/services/s-z/srdp/sacservices/ (accessed 4 July 2011)

[81] represented by the National Farmers' Union (NFU) and the Country Land and Business Association (CLA)

voluntary management that will benefit the environment, helping to achieve Natural England's target for 70 per cent of farmland (UAA) within an agri-environment agreement by March 2011[82], and doubling the uptake of entry-level agri–environment 'in-field' options (a group of ELS options that were considered to be particularly valuable in terms of mitigating the loss of set-aside, but had not been popular with farmers).

A communications network was established to promote these aims, with printed materials, national and local events, media coverage, promotion by Campaign partners and wider industry and a website. A training programme was developed for agronomists and advisers, local liaison groups were set up and 'beacon farms' nominated to demonstrate the Campaign working in practice. After the first year of the Campaign a survey of farmers found that 19 per cent had a good understanding of the Campaign and a further 39 per cent had some understanding, while 25 per cent of farms have already taken direct action in response to the Campaign.

7.3 Characteristics of effective support networks

The experiences described here of using support networks for entry-level agri-environment schemes in the case study Member States illustrates both the diversity of provision and the extent of some common problems, for example in providing a consistent level of support in regional offices, in creating and maintaining institutional capacity for environmental advice and building trust between farmers and government advisers.

In a recent report to the European Parliament it is argued that greater emphasis on (and availability of) advice and effective extension services will be essential if EU agriculture is to provide environmental and other public goods in future. The report suggests that this will require a combination of extending the FAS beyond cross-compliance (this is already possible if Member States choose to do so), making more use of the advisory measures within Pillar 2 and greater provision of nationally funded extension services (Hart *et al,* 2011). The recent Commission proposals for the future CAP reflect this need by placing a far greater emphasis on the role of advice. It is clear, however, that simply incorporating agri-environment advice into the current FAS structure is unlikely to be sufficient, given that the FAS evaluation (ADE, 2009, European Commission, 2010) found that large farms were the main beneficiaries of the FAS, and that it was not an effective tool for appealing to farmers and changing their views on sustainable farming. If the FAS is to be used to extend the provision of advice to agri-environment schemes as proposed then changes will be needed to the way in which it is designed and implemented on the ground.

Drawing on the literature, the findings of the cases studies and the expertise of the research team it is clear that effective support networks for entry-level agri-environment schemes share at least some the following characteristics:

- Support is targeted at both scheme priorities and farmers' needs, and is sufficiently flexible to address the specific needs of individual farmers;

[82] The start of the CFE coincided with the end of the first tranche of five year agreements under the entry-level schemes, and the challenge was to achieve a high level of renewals with, preferably, a more favourable profile of option uptake.

- The support framework has the capacity to cater for needs of different groups of farmers eligible for the same entry-level scheme, needs which will depend on the farmers' administrative capacity, technical understanding and existing sources of advice;
- Networks offer consistent advice from a range of providers at national and regional/municipal level;
- Support is available in a form and a place that is easily accessible to the target farmers, whether this is a national website with detailed information, publications, a helpline or one-to-one advice in a local office;
- Information on administrative rules, agri-environment management requirements, scheme eligibility and targeting is consistent and up-to-date across all sources;
- Farmers have access to technical agri-environment advice free of charge from a trusted source which understands the relationship between the agri-environment requirements and the farming system;
- Support is available throughout the whole period of an agri-environment contract, not just during the application and setting-up process.

Examples of effective support networks from the case study countries are shown in Box 7.1

Box 7.1: Examples of effective support networks for entry-level agri-environment schemes

Mobile advisory teams in Bulgaria

This five-year project is managed by the Bulgarian Society for the Protection of Birds with funding from the UNDP and runs until 2012, aims to ensure the long-term conservation of HNV grasslands in Bulgaria and assists with the preparation and implementation of agri-environment management plans in the pilot areas.

Two mobile teams of consultants (two to three persons each) provide advice and support for interested farmers both on the project grant scheme and RDP support. They work throughout the whole process with the farmers: from the identification of their support needs, to the development and submission of the application, all the way through implementation and final reporting. This includes the identification of their land in the LPIS because land eligibility is a serious issue at least in one of the project sites. The teams also support farmers in their transactions for renting pastures from municipal authorities.

The team in Besseparski Hills has, since 2008, been assisting three farmers to apply for support under the 2007-2013 RDP entry-level agri-environment programme, and in 2011 they assisted 11 more farmers to apply for Natura 2000 payments. During the application window (March – June) the team provided more than 30 consultations in Ministry municipal offices and organised two information days in Bratsigovo and Stamboliisky municipalities.

In 2010 a special reference book of key farmland bird species was published and distributed among farmers. The book consists of 96 pictures of farmland bird species, with information about their main characteristics and importance, breeding and feeding areas, etc.

According to the project team, the key factor for the success of any agri-environment action is the intensive technical support and consultations that should be provided to the interested and participating farmers. Without it the biodiversity conservation goals can hardly be achieved.

Source: Interview with the mobile team in Besseparski Hills; BSPB, Project "Conservation of globally important biodiversity in high nature value semi-natural grasslands through support for the traditional local economy" website : http://bspb-grasslands.org/

A farmer-led initiative for water protection in Finland

The TEHO project (2008 - 2010) is the first of its kind in Finland, in that it is a bottom-up approach instigated and led by two regional branches of the Central Union of Agricultural Producers and Forest Owners in Varsinais-Suomi and Satakunta in southwest Finland. The focus is on promoting agricultural water protection, with project funding coming from the national agricultural and environmental Ministries and the region, as well as from the Union itself.

The project covers around 12,000 farms and 20 per cent of Finnish arable land. The aim is to find the most suitable farm-specific measures for water protection, working in close co-operation with farmers and to develop an environmental protection handbook for the use of the farmers. The results, conclusions and experience are being utilised in the preparation of the next agri-environment programme in Finland from 2014.

The project has published ten reports on different aspects of environmental and cost-efficient management on farms, including the use of agri-environment schemes, and also leaflets on specific topics (for example, how to define the width of the buffer strips required for various ditch types as part of entry-level compliance). All the materials are available online and have been widely distributed among farmers. They represent a unique advisory resource for famers seeking both management solutions and environmental support payments. The project will continue until 2013.
Source: Finland case study

Advice on Catchment Sensitive Farming in England

The England Catchment Sensitive Farming Delivery Initiative (ECSFDI) was established in 2006, as part of a programme funded by the Department of Food and Rural Affairs to tackle diffuse water pollution from agriculture, in order to meet the objectives of the Water Framework Directive (WFD).

The Initiative funds both a programme of farm advice and associated investment support and is run as a partnership between Defra, Natural England and the Environment Agency. It originally provided advice to farmers in 40 priority catchments, identified by the Environment Agency and Natural England based on WFD risk maps and designated sites at risk from diffuse pollution. The number was extended to 50 in 2008, covering around 40 per cent of the agricultural land in England (Grischeff *et al*., 2010). This advice is provided by Catchment Sensitive Farming Officers (CSFOs) and by specialist advisers, through workshops, seminars, farm demonstrations and a substantial programme of one-to-one farm visits. CSFOs have a particular role to ensure that farmers select the Environmental Stewardship options of most benefit to water quality (ECSFDI 2008, Grischeff *et al*. (2010) provide a list of these). The Initiative was originally funded for two years, then in 2008 funding was extended until 2011, and has recently been renewed for a further three years, to 2014 (Natural England 2011).

A comprehensive monitoring and evaluation framework has been established, which includes farmer surveys, records of changes in farming practice, modelling of impacts and, in the longer term, measures of changes in water quality. The report on phase 1 of the Initiative covered the period April 2006-March 2008 (ECSFDI 2008). The report on the second phase is due shortly.
Source: UK case study

iLPIS – internet-based support for applicants to entry-level agri-environment schemes in the Czech Republic

The Land Parcel Identification Service (LPIS), which is available to farmers free of charge via internet, is called iLPIS and provides detailed map and orthophoto based information at the scale of individual parcels for:

NVZs: farmers can see the management required within each parcel, which varies with the characteristics of the land.
Agri-environment scheme applications (per parcel):

- information on records of nutrient use, current schemes, LFA, protected area, Natura 2000, NVZs;
- landscape features – state, type, responsibilities;

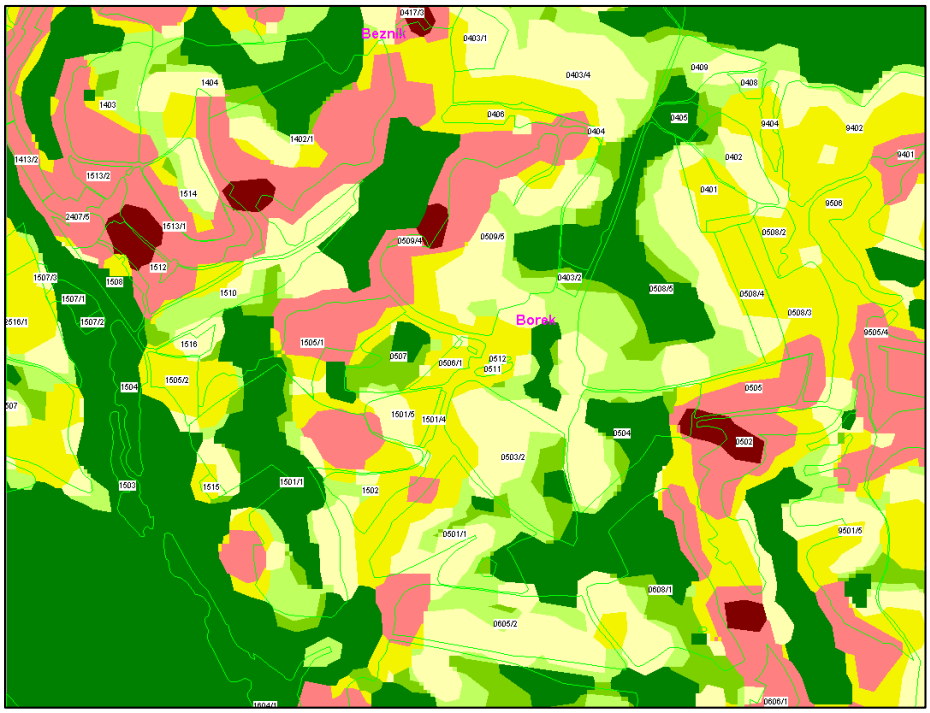
- nesting places of birds, habitat types on grassland; and
- suitability for conversion to grassland.

This means that farmers can see on the map which parcel is suitable for which scheme.

Additional properties of iLPIS which farmers can use:

- tools for using the map (printing, measuring distance and area, making additions to the map e.g. manure storage, changing parcels);
- overview of measures applied to individual parcel;
- exporting data from iLPIS, e.g. for GPS;
- layers showing the level of erosion risk, recommendations for each parcel, a facility to search for and print details of parcels with risk of erosion;
- inputs of crop rotation; and
- proposals for the use of fertilisers.

The map below shows, at field-scale, the risk of soil erosion (green lines are boundaries of field parcels and red areas represent the land at most risk of erosion). Maps like this are available online as part of the LPIS for all farmers to use in applying GAEC soil standards and agri-environment requirements to their land, but the map for agri-environment management is simpler (source: Mistr 2010).



Source: Portál farmáře – Nový iLPIS, Sitewell s.r.o., 2010, http://eagri.cz/public/web/mze/farmar/LPIS/uzivatelske-prirucky/lpis-pro-farmare/prirucka-pro-praci-s-ilpis.html

7.4 Effect of participation in entry-level schemes on farmers' attitudes to environmental issues

This section considers the extent to which participation in entry-level schemes in the case study countries has made farmers more receptive to environmental issues generally, and whether, as a result, they are more likely to join more demanding/higher-level agri-environment schemes. Isolating the effect of entry-level participation from other influences on farmers' attitudes and behaviour is not easy, however and much of the available information is anecdotal or covers wider issues.

In **Bulgaria** there has only been four years of agri-environment implementation, severely hampered by administrative problems and delays. This was preceded by a five year delay in implementation of the SAPARD measure which led to disappointment and loss of motivation by farmers. These experiences and other administrative problems (for example changes in LPIS, inability to combine agri-environment actions on one parcel of land) coloured farmers' opinions of agri-environment support. Farmers' attitudes were examined as part of the MTE of the 2007-2013 RDP. Farmers state that the main reason for applying for agri-environment support is that this would improve their farm income. The second reason is to meet environmental costs which cannot be covered otherwise. The importance of nature conservation and environment comes in third place. Understandably, the majority of farmers planned to use the agri-environment payments to cover operational costs, which is consistent with the philosophy of agri-environment payment calculations. Interestingly, the second intended use of the money was on machines and equipment, which on the one hand is justified by the overall low level of farm equipment in Bulgaria, but on the other hand implies that farmers may be unwilling to adopt additional agri-environment actions if these require additional and specialised equipment which they lack (although this is not often likely to be the case).

Farmers' receptiveness to environmental issues generally or to more demanding environmental actions was not studied specifically as part of the MTE of the Bulgarian RDP, but around 10 per cent of the farmers interviewed stated that they would increase their environmental activities to a moderate to significant degree even if they ceased implementing the agri-environment measure, and 43 per cent of respondents said that there would be no change in their actions, indicating that more than half of the participating farmers are committed in one way or another to environmental land management.

In the **Czech Republic** there is some evidence that farmers have learned about the environment from their involvement in entry level schemes and in a few cases this has even influenced then to join higher level schemes. However, this effect is more noticeable in the case of more targeted schemes (Wollmuthova and Skorpikova 2008). The effect may depend on the scheme. For example some farmers understand the benefits of cover crops and are now more environmentally conscious, but there is much less effect for grassland management, where there is little face to face advice or explanation of the purpose of the schemes[83] and the lack of trust by farmers of more distant information sources prevents them accepting the rationale behind the schemes (Prazan 2007). When asked about their motivation to join the agri-environment programme, 26.3 per cent of farmers mentioned environmental concerns and seven per cent lifestyle. Several of them provide some environmental services even without agri-environment participation, for example erosion prevention, reduction of fertilisers and pesticide use, management of landscape features, and enrichment of crop rotation (Wollmuthová and Skorpíková 2008). Other than the opinion of experts, there is no evidence of the influence of entry level schemes on farmers' willingness to participate in higher level schemes. One source said that farmers who joined the entry level scheme for grassland management were likely to join the higher-level

[83] source: researcher who coordinated design of the schemes, policy consultant

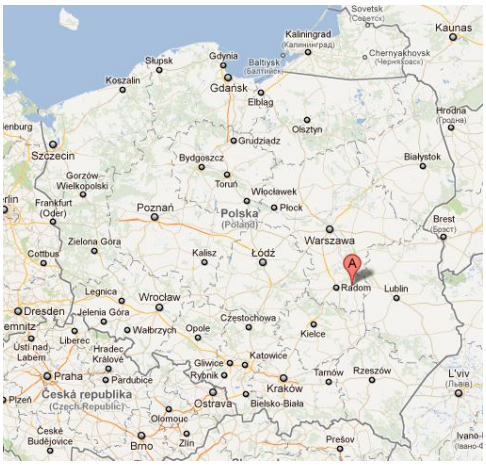
scheme for permanently wet and peat meadows[84]. In the Czech Republic there is anecdotal evidence that, as a result of the agri-environment scheme, some farmers have adopted the practice of growing covers crops (not used in the Czech Republic in the 1990s) and now understand the benefits.

Almost universal participation in the entry-level scheme in **Finland** makes it impossible to test its effects on farmer attitudes. Personal communication from several interviewees suggest that the programme with its '*broad nature*' and wide coverage has considerably contributed to the farmers' awareness of environmental issues (especially in the case of water protection), stating that *'one of the whole points of the AEP is to increase awareness*' and '*farmers are pushed to think about inputs and to keep records'*. However, the universality and extent of these effects on farmers' attitudes cannot be ascertained. Potential perverse impacts on farmers' environmental attitudes may result in actions that were originally driven by cultural perceptions of 'good farming' practice becoming dependent on monetary stimuli. There is also a concern that the current stringent control-based system alienates recipients from the 'good behaviour' culture typical of Finland (MTE). One observer commented that '*paper-based control eats up honesty*'.

Box 7.2: Farmers' attitudes to agri-environment payments in a village in Poland

In the village of Sucha in the Pionki community in central-east Poland more than 30 farmers implement the ten entry-level agri-environment management actions selected for this study. Their response to the huge changes in Polish agriculture over the past 10 years helps to explain why agri-environment payments are regarded by most Polish farmers simply as another source of income support.

Location of Sucha village in Poland



Source: Google maps

Before accession to the EU all the farms were engaged in agricultural production and each farm sold some products to the market. Milk production was especially popular and it is said that in 1990 there were more than 600 cows. By the beginning of 2000 the number of cows had dropped to around 100 but milk was still sold to local dairies and on the market. As a result of intensive efforts by the extension service to provide information about CAP direct payments and other EU support, a lot of farmers decided to participate in the agri-environment programme, mostly signing up to actions such sustainable farming, extensive meadows and pastures and soil protection. Today there are just two cows in the village and milk is sold only to village residents. Farmers have reduced agricultural production to the absolute minimum, while still fulfilling all the agri-environment requirements, and undertake work outside the farm, or in some cases do nothing. One farmer[85], interviewed by the case study author, expressed the general view of the group that the income from direct payments and the agri-environment programme is more profitable then agricultural production and, for those willing to accept a low standard of living, is enough to live on.

Source: Maciejczak M (pers. comm)

[84] source: case study interview with policy consultant and adviser

[85] Identity withheld, at the farmer's request.

In **Poland** recent studies of farmers' attitudes reveal that agri-environment support is seen by farmers simply as an additional source of household income. They generally do not understand the environmental and nature conservation goals of the programme or that they are being compensated for providing public goods to society (the views of farmers in one Polish village are described in Box 7.2). The supporting institutions and the farmers have very different views of the agri-environment programme and it has been suggested that, paradoxically, the long term effect of the schemes currently implemented might lead not to enrichment of biodiversity but to undermining regions' natural identity. This is due not just to a lack of understanding on the part of the farmers but also to the way information is provided, an over-simplification of the schemes and a lack of regional and local differentiation in management requirements.

In **England (UK),** as part of the initial evaluation of the entry-level scheme in 2005-06, farmers were asked why they had joined the scheme. Compatibility with existing practices and environmental or conservation benefits were the most common reasons (49 per cent and 46 per cent respectively) and overall 38 per cent of respondents mentioned financial benefits, but only 13 per cent were motivated by purely financial reasons. A postal survey of scheme participants five years later (2011) asked farmers '*How has membership of the scheme affected your attitude to environmental protection/conservation? Do you feel more positive, less positive or about the same*?' Of the 238 responses received, 55 per cent felt more positive, 43 per cent about the same, and only two per cent felt less positive. 93 per cent said that they would renew their entry-level contract. A current Defra-funded study is investigating farmer attitudes to environmental management[86] and, asked what the study was revealing about the effect of ELS on farmer attitudes, the study director said:
'There is evidence from our interviews that participation in ELS has increased farmer's awareness of the environmental issues that are pertinent to agri-environment schemes, but less so their attitudes. If the options they implement have a dramatic effect on the wildlife they see then this can have a positive impact on their attitudes and they become more engaged with the environmental issues. However, this is less likely to happen with ELS.'[87]

Similar surveys in **Scotland (UK)** for the MTE found that farmers' attitudes to agri-environment measures had changed 'moderately', but this survey did not distinguish between entry-level and higher-level schemes.

There is little evidence as to whether membership of entry level schemes increases the likelihood of joining higher level schemes in the UK. In **England (UK)** entry-level participation is a condition of application for the higher-level scheme, which is competitive, so participation in both reflects not just the farmer's desire to join but also how well the application meets environmental targets. In contrast to the situation in England, entry-level participation is not a pre-requisite for joining the higher-level scheme in **Scotland (UK)**, where both schemes cover measures under all three axes and the higher level is by far the larger in terms of both commitment and actual expenditure, although there are more entry-

[86] http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=17403#Description

[87] UK case study

level contracts. In October 2011 there were 6,221 contracts with agri-environment options, of which 1,886 were higher-level only and 3,502 were entry-level only. Just 853 agreements have agri-environment options at both levels, which suggests that the schemes are seen independently, rather than entry-level acting as a primer for higher-level.

The limited evidence available suggests that farmers' attitudes to the environment and willingness to join agri-environment schemes may be influenced by a wide range of factors, including benefits to farm income and ease of implementation within the current farm system. In some cases there is evidence that participation in entry-level schemes has had a positive influence on farmers' attitudes to the environment generally; in others opportunities to influence attitudes have been missed through failures to provide farmers with appropriate information, particularly about the environmental objectives of the schemes.

8 CONCLUSIONS AND RECOMMENDATIONS

This chapter outlines the main conclusions of the study and sets out recommendations for the design and implementation of entry-level agri-environment schemes in the future.

Agri-environment policy is a long-established part of the CAP, which now plays a key role in addressing the Community's wide range of environmental priorities on almost 40 per cent of EU land that is under agricultural management. For the past 20 years it has been the only compulsory measure within rural development programmes, delivered through multi-annual contracts with individual farmers. The agri-environment programmes in the 88 RDPs of the EU-27 vary considerably in scope and structure, but typically include several schemes addressing a range of environmental priorities and types of land, with farm-level requirements of differing levels of complexity and ambition. These differences are characterised broadly as 'entry-level' and 'higher-level' and the focus of this study is on entry-level agri-environment management. This may be described as being fairly simple management achievable by the majority of farmers without major change to their existing farming systems; often relatively close to the environmental reference level which forms the baseline for agri-environment payments under the relevant legislation; and accessible through a non-competitive application and approval process which is largely administrative.

Many agri-environment programmes have separate entry-level schemes, although these are not usually described as such. They may apply to the whole farm or just specific land or crops, may offer farmers a choice of management options or be compulsory to some extent, and may be targeted at different farming systems, geographical zones or environmental priorities. Some agri-environment schemes include both entry-level and higher-level options, in others participation in an entry-level scheme can be a prerequisite of applying for higher-level schemes.

The aim of this study was gain a better understanding of the design and implementation entry-level agri-environment schemes within the EU-27 RDPs for 2007-13. This required the diversity of entry-level agri-environment support in the EU to be reviewed and categorised. *Entry-level management actions* (what the farmer is required to do) were used as the common unit of analysis for this purpose, to eliminate any distorting effect of differences in the structure and terminology of entry-level schemes. This analysis formed the basis of a typology of entry-level agri-environment management against environmental objectives. The focus of the second stage of the study was to consider in more depth selected *entry-level schemes* in seven Member States, where case studies were used to gather more detailed information on scheme design, implementation and farmers' attitudes.

This study does not attempt to evaluate the environmental impact of entry-level agri-environment schemes, nor does it cover agri-environment support for organic farming, integrated production and genetic resources, because these were not considered to be entry-level in character.

The typology illustrates the diversity of entry-level management actions, their potential to deliver against a wide range of environmental objectives and their distribution within Europe

A key characteristic of environmental policy within the CAP is that farm-level environmental requirements should be defined by national or regional authorities, within a framework set at EU level, reflecting local needs and priorities. Any expectation that a typology of entry-level agri-environment management might consist of only a few categories of rather standardised requirements has been refuted by this analysis, which illustrates the diversity of entry-level management requirements implemented in different Member States.

In the EU-27 RDPs entry-level agri-environment management actions are available to support environmental management within almost all farming systems including arable, livestock, horticulture, permanent crops and rice. A total of 63 different types of agri-environment management actions were identified, grouped into 15 broad categories and pursuing nine broad EU environmental objectives.

There are some striking differences between RDPs in terms of the range of entry-level management actions used within their agri-environment schemes. These range from as few as five of the 63 different types to more than twenty-five. However, the most commonly used entry-level actions (in more than two-thirds of the 81 continental RDPs) relate to four of the 15 categories:

- managing grass and semi-natural forage;
- restricting the use of fertilisers and agro-chemicals;
- protecting soils; and
- keeping records or preparing management plans.

The EU-15 RDPs tend to use a broader range of entry-level actions than those in the EU-12, perhaps reflecting their longer history of agri-environment development. However, this distinction does not hold true for individual RDPs within these two groups. The categories of entry-level actions in the RDPs for the outermost regions are similar to those found in continental Europe, which suggests that the classification of management actions used for the typology is robust in the widest EU context.

Some types of management action have quite similar farm-level requirements wherever they are used, for example maintaining green soil cover over winter, or restrictions on hedge trimming during the bird breeding season. Others may differ quantitatively: for example minimum and maximum stocking densities, frequency and timing of mowing grassland, limitations on fertiliser rates, numbers of crops in a rotation. Such differences cannot be interpreted directly as a representation of how ‘demanding’ the requirements are, for two key reasons. Firstly the reference level varies from one RDP to another, so identical requirements in two RDPs may have a different relationship with the reference level. Secondly, requirements relating to stocking density and fertiliser requirements inevitably vary with the soil type, crop, vegetation cover and climate, so environmentally appropriate levels will differ from place to place.

There are some common patterns in the way in which entry-level management actions are packaged together within agri-environment schemes, for example structured around an

objective (reducing nutrient run-off), an environmental feature (field boundaries) or a type of land use (arable cropping, extensive grassland management).

Many types of entry-level management action have the potential to contribute concurrently to multiple environmental objectives, most commonly farmland biodiversity, climate change adaptation, agricultural landscapes and soil functionality. The following categories of management actions contribute to almost all of the nine EU environmental objectives used in the typology, although the extent to which they do so in practice will depend on the detailed management undertaken and the area over which they are implemented:

- farmland not used for production;
- permanent pasture;
- traditional crops and grassland;
- some types of green soil cover; and
- farmer training, management plans and record keeping.

Differing structures of entry-level schemes and levels of experience in implementation

The case studies illustrate a number of different structural models that have been designed for agri-environment programmes. In some the agri-environment programme consists entirely of entry-level schemes (Bulgaria), in others these are combined with higher-level schemes (Finland, France, Poland and England (UK)) and one has an entry-level scheme that offers agri-environment options alongside those for forestry, Axis 1 and Axis 3 (Scotland (UK). These structural choices seem to reflect not just the environmental priorities and agricultural situations in Member States but also the relative importance of the agri-environment measure within RDPs, the level of experience of the managing authorities in designing and delivering agri-environment schemes and the capacity of both institutions and farmers.

The effect of 'inexperience' in implementation is particularly evident in Bulgaria, where delivery of a well-designed entry-level scheme, carefully targeted at key EU biodiversity priorities, has largely failed because of institutional problems, conflicts with other nationally defined elements of agriculture policy, and a regulatory rather than supportive approach to farmers. In Poland, also with very little previous experience of agri-environment schemes and many small farms, uptake targets have been met for the first national scheme, although with less environmental differentiation than in the previous scheme.

The link and degree of fit between the structure and content of entry-level schemes and national or regional environmental priorities is clearer in some case study Member States than others. Common entry-level priorities are the protection and management of soils and the reduction of diffuse pollution (for example, Finland and the Czech Republic where these are key environment priorities); biodiversity is an entry-level priority in some of the case studies, for example England (UK) and in the two EU-12 Member States where existing HNV farmland is at risk (Bulgaria and Poland).

Relationship between the reference level and entry-level agri-environment schemes

The study has confirmed the expected variability of the reference level between Member States and regions, much of it due to differences in local legislation and GAEC cross-compliance standards defined by Member States within the EU framework to take account

of different bio-geographic factors, farming systems and other local conditions. At farm scale, environmental designations such as Natura 2000 and Nitrate Vulnerable Zones can result in different reference level requirements applying between and even within individual farms. In one case study country (Bulgaria) a GAEC standard has been introduced specifically for HNV farmland, and forms the baseline for an entry-level scheme that is also available to farmers who do not qualify for Pillar 1 payments.

Seven of the eight most commonly occurring types of management in entry-level agri-environment schemes[88] can also be found as standards within the reference level. These two policy measures are therefore closely related and any changes to the reference level necessitate changes in the management requirements and payment rates of associated agri-environment schemes.

Where it has been possible to examine a lengthy time series of entry-level schemes, as in France, it is fairly clear that as the reference level has become more demanding, so have the agri-environment requirements and payment rates have increased too, although not always proportionally. In the UK, cross-compliance was first introduced when it was optional and since then the main driver of change in the reference level seems to have been the need to adjust to GAEC standards, as a result of changes in EU legislation. Changes in the reference are not the only reason for revisions to agri-environment schemes, which may be necessary to improve environmental impact or uptake. Agri-environment schemes are voluntary, and must be responsive to the changing policy and economic context within which a farm business operates.

The current CAP reform proposals to make a proportion of Pillar 1 direct payments conditional upon undertaking certain environmental management actions would raise the reference level for agri-environment schemes. In some cases, certain management actions may need to move from current agri-environment schemes into the new 'green' payments, and this is likely to require revisions to the design and payment rates for entry-level schemes. Related higher-level schemes may also have to be revised. This may have an effect on uptake of entry-level schemes, although the extent to which this is likely is impossible to predict at this stage.

Payment rates and their use in scheme design

Member States have applied the inherent flexibility of rules governing the agri-environment measure in successive CAP regulations not just to designing management actions but to scheme design and pricing too. There are many variations and refinements of the structural and payment frameworks for entry-level management actions within the requirements set by the EU Regulation. The different types of payment structures include payments per hectare of land in a specific type of management, or for the whole farm. Payments may be flat rate, degressive or capped. Where several entry-level schemes exist within one agri-environment programme, it may be possible to combine some (but not others) on the same area of land or within the same farm.

[88] Management of grass and semi-natural forage; input management; management plans and record keeping; soil cover; soil management; buffer strips; and landscape feature management.

Annual payments are made per hectare or per metre (for linear features such as hedges) and may be differentiated by bio-geographical zone, farming systems or by soil type. Quite often less than 100 per cent of the net calculation used for the payment rate, and in such cases there may be scope to vary this proportion as a means of incentivising uptake of the more environmentally beneficial options. There is very limited use of transaction costs, with only one of the seven case study Member States routinely adding this (Finland), although there appear to be other cases where it may be justified, especially where farmers complain of the administrative burden or the need to seek advice.

Targeting and differentiation of entry-level management requirements

In some of the case study countries considerable efforts have been made to target entry-level agri-environment management at specific environmental features or areas at risk, by defining eligible geographic areas (the Czech Republic), prioritising applications from target zones (Bulgaria) and in one example selectively adjusting payment rates within the calculation framework (UK). Delivering this level of targeting across large numbers of farms requires easily accessible and comprehensive definition of the target parameters at farm level. In the Czech Republic very effective use has been made of very detailed soil and grassland maps made available online to farmers through a GIS adaptation of the LPIS system. By contrast, in Bulgaria, entry-level management actions that differentiated between undergrazed and overgrazed HNV pastures could not be implemented because these areas could not be readily identified for implementation and control purposes.

Factors affecting uptake of entry-level agri-environment schemes

There is a wide range of factors that influence uptake of agri-environment schemes. Evidence from the case studies shows that the relationship between these different factors can be quite complex and the effects are not always easily predicted. One of the key factors influencing uptake appears to be how easily the required management fits into the existing farming system, although studies in the UK suggest that farmers may sometimes underestimate how much change in management practice will actually be required and uptake may suffer if just one element of a scheme is unacceptable to farmers. Payments, which are perceived to be too low, or reductions in existing payments may lead to lower levels of uptake, but paradoxically sometimes seem to have little effect. Conversely, some well-rewarded agri-environment actions may be very popular, but the uptake of others can be poor, especially on arable farms where there may be alternative, economically attractive uses for the land. There is some evidence of entry-level schemes providing a significant additional income stream which helps farmers to resist economic pressures to change farming systems that already provide environmental benefits. For example, the maintenance of the environmental value of existing extensively managed grasslands and semi-natural forage areas often depends on the continuation of marginally economic livestock systems. In both environmental and social terms it is more effective to keep these systems in place than to attempt restoration after livestock farming has ceased.

The main positive influences on uptake may be summarised as:

- requirements that fit well with the farming system that is already in place, or can be adopted without significant change;
- agri-environment management targeted at the less productive areas of the farm, such as poorer soils and field edges;

- synergy between agri-environment management and arable cropping systems, for example by improving soil protection;
- the positive contribution of agri-environment income to the survival of economically marginal farms, especially in areas at risk of abandonment.

Factors that can significantly inhibit uptake include:

- a lack of capacity on the part of the farmer or farm business, in terms of technical knowledge, understanding or administrative ability;
- farmers' concerns about the effect of agri-environment management on crop yields or quality;
- payment rates that are perceived by farmers as insufficient, especially where farms are small in scale;
- lack of institutional capacity and delays in application processes or payments can discourage farmers from applying for agri-environment support.

Experience of designing and revising entry-level schemes, and the development of institutional and farmer capacity in implementation

All the case study schemes had their origins in earlier RDPs, national schemes or pilot programmes. Some Member States with extensive experience of agri-environment implementation use small-scale pilot testing and evaluation of new entry-level schemes and management options, (UK, and more recently Finland). This can be a cost-effective way of testing management requirements, payment rates, delivery processes and farmer reactions.

In most cases a wide range of stakeholders are involved in scheme design, with on-going benefits of 'social learning' which extend into the delivery process. In Italy for example, efforts to involve farmers (the potential beneficiaries) as equal partners in scheme design seem to have been particularly rewarding, and have led to high uptake levels of a new biodiversity scheme.

Entry-level schemes may be revised for the start of a new programme or during its course, and the frequency, type and purpose of revisions also varies considerably between RDPs. Drivers of change include problems of implementation and uptake, changes to the reference level and the need to improve environmental effectiveness and geographical targeting. In some cases considerable efforts are made to obtain and use evidence to design schemes and improve the effectiveness of entry-level management. A feature of UK agri-environment schemes is a review process during the first two years of a new scheme.

Farmer support networks can make a significant contribution to the effective delivery of entry-level agri-environment schemes, and failure to provide these can limit agri-environment uptake and effectiveness. To be effective, however, the information provided must be accurate, up to date and relevant to the differing needs of individual farmers. Support and advisory services may need to be differentiated for specific target groups (for example large intensive commercial farms and small family farms) and it is important that the source is trusted by the farmers.

Opportunities may have been missed to use entry-level schemes to influence farmers' attitudes to the environment

There is very little empirical evidence on the effect of participation in entry-level agri-environment schemes on farmers' attitudes to the environment, or on their participation in higher-level agri-environment schemes, although some schemes seem to have raised awareness of environmental issues more generally. Some opportunities to influence attitudes have been missed through failures to provide farmers with appropriate information, particularly about the environmental objectives of schemes. A requirement for agri-environment training as part of entry-level schemes might help to solve some of these problems. At present the only case study country doing this is Bulgaria, where training was introduced in 2010.

Recommendations for future entry-level agri-environment schemes

This study has shown that entry-level management actions are included in the agri-environment programmes of all 88 RDPs, are applicable to all farming systems, and have the capacity to deliver multiple environmental objectives of importance at EU level. The extent to which this potential is met depends not just on the type of management actions within entry-level schemes, but how they are differentiated and targeted to meet local circumstances and, crucially, on the effective implementation by a significant proportion of farmers in the most appropriate locations. If this can be achieved, even quite small incremental increases in environmental management may have a cumulative effect at a landscape scale. These schemes also provide an opportunity to introduce farmers to the principles and practice of environmental land management.

In the light of the findings of this study the following recommendations are made for the design and implementation of future entry-level agri-environment schemes.

In the context of other CAP policies:

- Entry-level agri-environment schemes should continue to provide an incentive for positive environmental management beyond the reference level, and act as a basis for more demanding higher-level agri-environment schemes.
- Entry-level schemes have two distinct roles: to improve current levels of environmental management; and to maintain environmentally appropriate land management where it already exists but is threatened by external factors
- Entry-level agri-environment schemes must not be seen in isolation, but as part of an integrated package of support, including LFA and other RDP measures.
- In the context of Pillar 1 support, the broad coverage of entry-level management can target regional environmental priorities by building upon the environmental foundation provided by the proposed 'greening' measures.

In the design and revision of agri-environment programmes:

- Targeted and differentiated entry-level agri-environment management requirements and payments should be used to incentivise uptake of the most environmentally beneficial options; available and emerging technologies offer cost-effective ways of doing this, for example by integrating environmental resource information with LPIS and making use of GPS at infield scale.
- There may be a case for revisiting the guidance on transaction costs to ensure that where needed and appropriate, these are included within the payment calculations.

- Farm-level advisory and support services can play a critical role in entry-level schemes, but must be seen to address the needs of the target group of farmers, and be accessible for the duration of their contracts. One option would be for Member States to extend the scope of the existing Farm Advisory Services to include agri-environment advice.
- The inclusion of agri-environment training within entry-level schemes could be of benefit, especially where farmers are unfamiliar with environmental land management.
- Involving farmers in scheme design and review processes can improve capacity building, understanding and uptake. Providing beneficiaries with feedback on the environmental impacts of their management reinforces this process.
- Small-scale pilot testing and evaluation of schemes or management actions could improve the efficiency, acceptance and delivery of entry-level schemes, especially where these are being introduced for the first time.
- 'Fast track' internal review processes during the first two years of a scheme provide an effective way of identifying and resolving problems before these can affect implementation or environmental effectiveness.

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LIST OF SOURCES FOR THE CASE STUDIES

Interviews for Czech Republic case study:

- Ministry of Agriculture - person dealing with measures under Axis II;
- Ms. Anna Vejvodova – independent consultant/adviser

Interviews for Finnish case study:

- Two people from ProAgria (commercial agricultural advisory organization project);
- One of the chief officials working on agri-environment planning in the Ministry of Agriculture and Forestry;
- TEHO project (see Box 7.1);
- Expert in agricultural biodiversity participating in agri-environment planning;
- Two farmers with long-term experience of the schemes.

Interviews for French case study:

- Representatives from the Ministry of Agriculture and Fisheries (Ministère de l'Alimentation, de l'Agriculture, de la Pêche, de la Ruralité et de l'Aménagement du Territoire):
    - M. Rik VANDERERVEN, chef du bureau des actions territoriales et agro-environnementales. Direction Générale des Politiques Agricole, Agroalimentaire et des Territoires ;
    - M. Pierre PHALEMPIN: Chargé de mission, Bureau des Actions Territoriales et Agroenvironnementales, Direction Générale des Politiques Agricole, Agroalimentaire et des Territoires ;
    - M. Frédéric COURLEUX: Chef du bureau de l'évaluation et de l'analyse économique, Sous direction de la Prospective et de l'Evaluation, Centre d'Etudes et de Prospective - SG/SSP/SDPE/BEAE ;
    - M. Clément VILLIEN: Chargé de mission économie de l'environnement et évaluation des politiques environnementales, Bureau de l'évaluation et de l'analyse économique, Centre d'études et de prospective - SG/SSP/SDPE/BEAE.

Interviews for Polish case study:

- Three independent experts, Mrs. Dorota Metera, Mr Henryk Runowski and Mr Adam Was;
- Two experts from paying agency , ARMA;
- Six farmers from Mazovia Province, five of them beneficiaries of the entry-level agri-environment scheme (all asked for anonymity).

Interviews for Italian case study:

- Antonio Frattarelli and Camillo Zaccarini, Ministero delle Politiche Agricole, Alimentari e Forestali (MiPAAF), Roma;
- Chiara Carasi, Direzione Generale Agricoltura, Regione Lombardia, Milano;
- Ermes Sagula, Area Ambiente e Territorio, Coldiretti Lombardia, Milano;
- Guido Bronchini, Produzioni Agricole ed Agroalimentari Biologiche ed Ecocompatibili, Gestione Interventi, Regione Lazio, Roma;

- Antonella De Marinis and Antonio Irlando, Area 11 Sviluppo attivita' settore primario Settore interventi per la produzione agricola, produzione agro-alimentare, mercati agricoli, consulenza mercantile, Regione Campania, Napoli.
- Marco Andreozzi, Unità Operativa 13 - Programmazione politiche agricole e sviluppo rurale, Dipartimento Interventi Strutturali - Assessorato Risorse Agricole e Alimentari Regione Sicilia, Palermo.

Interviews for the UK case study:

- Representative from Scottish Natural Heritage;
- Representative from RSPB;
- Representative from Natural England.

ANNEX 1 - LITERATURE REVIEW OF EXISTING AGRI-ENVIRONMENT TYPOLOGIES

Summary

This literature review shows that there are no approaches to date that take account of entry-level agri-environment schemes across all 88 RDPs. There appears to be a trade-off for agri-environment research where detailed analysis of management actions is compromised by smaller sample sizes. The AFI has developed a typology that could be applied to any farm across the EU, however, the results are limited to seven case study countries (Denmark, Finland, Germany, Greece, Hungary, Ireland, and the UK) and do not go further because the analysis becomes too detailed. The benefit of this approach is that each scheme can be referred to with accuracy even if the authors are unable to reach a conclusive typology for EU-27 as a whole. This type of conceptual framework that has also been developed in AgriGrid cannot be applied to a large source of data as both the methodology and results would be too complex at an EU-27 scale.

Oréade-Brèche (2005) and Bonnieux, *et al* (2006) have developed typologies that could be effective if applied to a large scale, but these are not sophisticated enough to distinguish between entry-level and high-level agri-environmental schemes. There is also an absence of up to date analysis on the implementation of GAEC standards, and how these relate to the management supported through agri-environment schemes, with the last comprehensive review of the implementation of cross compliance undertaken in 2007 (Alliance Environnement, 2007).

There are several ways of building a typology of agri-environment schemes - for example structured around environmental objectives or farming systems or management requirements. This literature review shows that no framework currently exists that gives a comprehensive overview of all 88 Rural Development Programmes and their respective agri-environment schemes, particularly those that are entry-level.

Introduction

There have been no systematic studies at EU level specifically of entry-level agri-environment schemes, nor any attempt to provide a comprehensive typology to examine the diversity of relationships between the reference level, basic agri-environment requirements and payments for these schemes.

A typology is a conceptual framework used for analysis and policy development. At EU-27 scale there have been no typologies of agri-environment *schemes*. For example, the evaluation of the agri-environment schemes under Regulations 2078/92 and 1257/99 for DG Agriculture categorised agri-environment measures in different ways (Oréade Brèche, 2005), but only covers the EU-15 and pre-dates the focussing of Axis 2 measures on Community environmental priorities. However, there have been recent attempts to devise typologies which could help in targeting agri-environment schemes and evaluating their impact, for example IEEP's typology of potential HNV farming systems in Europe (IEEP, 2007) and the new biophysical Agri-Environmental Zonation typology developed by the FARO-EU study for use within the integrated assessment framework of SEAMLESS (Hazeu et al 2010).

At EU level, agri-environment schemes were first introduced under Article 19 of Council Regulation (EEC/797/85) 'on improving the efficiency of agricultural structures'. The Regulation gave Member States the option of designating 'environmentally sensitive areas' where there was a need to support 'farmers who undertake to farm environmentally important areas so as to preserve or improve their environment'. As some Member States chose to adopt Environmentally Sensitive Areas (ESAs) when they were first introduced as a voluntary initiative some Member States have a more comprehensive history of agri-environment schemes than others. For example, the UK had already set up the Broads Grazing Marshes Conservation Scheme in 1985, and soon designated more than 40 ESAs, whilst other Member States waited until the 1992 MacSharry reforms, when agri-environment first became compulsory for all Member States. The importance of such practices has become more prominent in recent CAP reforms, such as the Rural Development Regulation and the two-pillar funding structure of the CAP which were implemented in 1999, and were followed in the 2003 reforms with decoupled direct payments dependent on the land being maintained in Good Agriculture and Environmental Condition (GAEC). The incremental nature of these developments, in particular when the agri-environment measure was first implemented in different Member States explains in part why agri-environment schemes vary so widely across the EU-27. Agri-environment is currently the rural development measure whose main objective is to encourage farmers to introduce or continue applying agricultural production methods compatible with the protection and improvement of the environment, landscape, natural resources, soil, and genetic resources. It is a key element in the integration of environmental concerns into the CAP.

The agri-environment measure is defined at EU level but Member States (and regions) are expected to design the schemes and outline the management actions most fitting to their territory, their specific needs but also reflecting the main priorities defined at the EU level. Member States have taken a range of approaches to implementing the agri-environment measure, reflecting amongst other factors political priorities, climatic variations, vulnerability to drought or soil erosion, characteristic farming systems and practices, habitats and features of farmland, perceived environmental risks and priorities, and socio-cultural differences in attitudes to the environment and to the role of farmers.

The resulting diversity of agri-environment schemes tend to differ in:

- The relative level of resources devoted to entry-level agri-environment schemes;
- The scope and ambition of the schemes' environmental objectives;
- The management required of farmers (for example, maintenance of habitats and features, or enhancement, restoration and creation);
- Availability of the scheme - open to all farmers across the country/region or targeted to particular areas, habitats or farm types;
- The environmental reference level, especially national/regional legislation and GAEC standards;
- Eligibility rules, which include a competitive element in some Member States.

This literature review sets out to look at existing typologies and see whether any have been developed that could facilitate the analysis and policy development of entry-level agri-

environment schemes across the EU-27 without overlooking the finer details particular to each Member State and region.

Existing typologies

Agri-environment measures cover such a broad spectrum of management actions that a typology intended to cover all actions in every one of the 88 Rural Development Programmes (RDPs) is an enormous task (Tsakalou and Vlahos, 2008) and to date remains unaccomplished. Several framework typologies have been used to analyse agri-environment schemes and associated payments, but none so far has looked at farm management practices in detail across the EU-27. There are five relevant studies, outlined below, that have developed typologies to analyse agri-environment schemes, but all of these have covered only a sub-sample of all 88 RDPs and not one has been specifically developed to address entry-level schemes.

The most comprehensive coverage to date is the study by Oréade-Brèche (2005). It covers all agri-environment schemes in all Member States in the EU-15 between 1992 and 2004. The typology developed by Oréade-Brèche categorises each agri-environment scheme by its environmental objective (table A1.1). Although this typology covers a broad scope of Member States and their agri-environment schemes, it does not distinguish between shallow and deep schemes or provide a detailed account of management actions within each scheme. Table A1.1 summarises the typology developed in this report of approximately 20 types of agri-environment schemes linked to their respective environmental objectives. This typology shows where environmental objectives overlap across schemes and can be applied to any agri-environment scheme in the EU-15 to show what type of schemes are in place and what purpose they are intended for.

Table A1.1: Types of agri-environment schemes in relation to environmental objectives

Environmental Objective	Type of Agri-environment Scheme			
Preservation of biodiversity	Reduce inputs	Appropriate cultivation (both in type of crop and rotation)	Cover crops at critical times of the year	Buffer strips
Preservation of habitats and areas of high natural value	Preserve habitats on agriculture land	Protect remarkable species	Buffer strips	
Preservation of endangered species	Protect endangered animals		Protect endangered plants	
Preservation of water quality	Reduce application of chemical fertilisers (eg liquid manure)	Reduce application of pesticides	Reduce application of nitrogen near water	Reduce application of pesticides near water
Maintain water quantity	Reduce amounts within water supply	Reduce irrigated surface area	Restrict draining systems	Carry out agricultural practices in keeping with water management
Protect soil quality	Manage soil erosion	Manage levels of organic matter in soil	Maintain the quality of soil (prevent acidification, salinisation, and compression)	Reduce inputs
Preserve rural landscape	Implement rotational crops and maintain meadows	Maintain perennial crops (eg olive groves and vineyards)	Create/maintain permanent landscape features	Maintain cultivation in marginal areas and areas at risk of land abandonment
Other	Maintain air quality	Encourage use of renewable energies	Manage forest fires	Other

Source: Oréade-Brèche (2005). Own translation.

Another evaluation of agri-environment measures as applied across the EU-27, for the Commission (European Commission, 2005), designed a typology to examine the relationship at EU level between different agri-environment practices which are allowed under the measure, and their environmental objectives (Table A1.2). The broad typology created in this study was intended to be generic to give an overview of how agri-environment measures have been designed from a top-down perspective. This typology does not have the capacity to analyse agri-environment measures at a Member State level because it does not account for the varying schemes and environmental objectives. It takes the environmental objectives and basic types of schemes as they are outlined in the CAP and uses this to generate a framework that can be applied to any Member State. This typology works best as a guideline for how agri-environment measures are designed rather than as an analytical tool.

Table A1.2: Agri-environment measures at an EU level

Type of Scheme	Environmental Objective
Input reduction:	Water quality; biodiversity; soil quality.
Organic Farming:	Soil quality; water quality; biodiversity.
Extensification of livestock:	Water quality; soil quality; biodiversity; landscape.
Conversion of arable land to grassland and rotation measures:	Water quality; water quantity; soil quality; biodiversity; landscape.
Undersowing and cover crops, strips and preventing erosion and fire:	Water quality; soil quality; biodiversity.
Actions in areas of special biodiversity/ nature interest:	Biodiversity; secondary effects on water quality and quantity.
Genetic diversity:	Genetic diversity; secondary effect on landscape.
Maintenance of existing sustainable and extensive systems:	Biodiversity; landscape; water quality; soil quality.
Farmed landscape:	Farmland biodiversity; landscape.
Water use reduction measures:	Water quantity.

Source: EC (2005). Own table.

Another typology for agri-environment schemes was developed in a report for the AgriGrid project, by Tsakalou and Vlahos (2008). This typology was created to look at the costs of agri-environment measures in seven Member State countries and selected regions[89]. In terms of designing an approach for gathering information, there are clear definitions of the commitments, practices and baseline referred to in their later analysis. This ensures that data was extracted in a consistent manner, irrespective of the lack of conformity among RDPs. The typology established in AgriGrid is a logic framework that can be applied to any

[89] Scotland, Germany, Greece, Finland, Italy, Czech Republic, Lithuania, Spain and Poland

given agri-environment measure (action) to analyse the cost of a management action. The framework has been summarised below (table A1.3)[90].

Table A1.3: Basic summary of Logic Framework for agri-environment measure costs

Step	Action
1.	Define the commitments;
2.	Identify the relevant commitment practices;
3.	Define the relevant baseline;
4.	Select the relevant categories;
5.	Identify the cost and revenue;
6.	Calculate the cost and revenue;
7.	Adjust the calculated payment to RDP limits;
8.	Report the total calculated payments

Source: Tsakalou and Vlahos (2008)

In keeping with the typology developed by Oréade-Brèche, Notre Europe (Bonnieux *et al*, 2006) examined the scheme by environmental objectives for a selection of ten regions within different Member States across the EU[91]. This typology can be applied at a scheme or management action level to determine the most significant environmental pressures in a region. The typology is not based on a broad range of regions and is not a useful tool for determining management actions. This typology has been established from environmental objectives to avoid the complexities of individual farm management actions across all 88 RDPs. It lists nine environmental objectives and applies them to the selected regions. Table A1.4 shows how this typology can be applied and the type of results it can produce for analysis. Of the three typologies discussed thus far, this is the most simple and as such, produces the simplest analysis.

Table A1.4: Environmental Pressures (ranked by decreasing order)

Region	Environmental Pressure (ranked by decreasing order)
Flanders	1. Water pollution (nitrates and pesticides) 2. Intensive energy use (horticulture) 3. Acidification 4. Air pollution (greenhouse gases)
Czech Republic	1. Biodiversity and landscape loss (land abandonment in mountainous areas with a valuable environment) 2. Water pollution 3. Soil erosion (mountainous areas) 4.Flood (mountainous areas)
Brandenburg	1. Biodiversity loss 2. Water Pollution 3. Soil erosion
Basse Normandie	1. Biodiversity and landscape loss (conversion of grassland, drainage and abandonment of wetlands, destruction of hedgerows)

[90] This is a very basic summary.

[91] Flanders (Belgium), Brandenburg (Germany), Basse-normandie (France), Veneto and Emilia Romagna (Italy), Freisland (the Netherlands), North-east England (the UK), Finland, Ireland and the Czech Republic

	2. Water pollution (nitrates) 3. Soil erosion 4. Flood (sea tides, urbanisation)
Ireland	1. Water pollution (nitrates and sediments) 2. Biodiversity loss 3. Air pollution (greenhouse gases and ammonia concentration) 4. Soil erosion (over grazing on hillsides)
Veneto	1. Water pollution (nitrates in lowlands) 2. Biodiversity and landscape loss (conversion of grassland, drainage of wetlands, destruction of hedgerows) 3. Soil erosion (mountainous areas) 4. Flood (mountainous areas)
Emilia Romagna	1. Water pollution (nitrates) 2. Food and environmental contamination (pesticides) 3. Biodiversity and landscape loss (destruction of hedgerows and tree rows) 4. Flood 5. Soil erosion (uplands and hills) 6. Air pollution (greenhouse gases)
Friesland	1. Water pollution (nitrates) 2. Biodiversity and landscape loss
Finland	1. Water pollution (nitrates and phosphorus) 2. Biodiversity and landscape loss (land abandonment ain the north and intensification in the east and south)
North East England	1. Water pollution 2. Biodiversity and landscape loss 3. Threat to historic features 4. Soil erosion

Source: Bonnieux *et al*, 2006.

The Agri-environmental Footprint Index (AFI) developed a typology to examine the environmental impact of agri-environment schemes (AFI, 2007). The typology is a conceptual framework and is similar to that developed for AgriGrid in that it is a 'step-wise process' and is based on Multi-Criteria Analysis. It is designed to collate data from agri-environment indicators in a ranking order based on stakeholder participation (Purvis et al, 2009). This framework allows the monitoring of the environmental impact of agri-environment schemes to be analysed. Of the four typologies discussed, it is the more complex and as such the analysis is more detailed. In theory, this typology could be applied to all Member States and at any scale, however, there were only 14 case studies (two from each participating country in the project: the UK, Denmark, Hungary, Ireland, Germany, Greece and Finland) and the results presented are at a farm-scale, for example in the UK, the case studies focussed on Environmentally Sensitive Areas (ESA) in the Upper Thames Tributaries (a pastoral landscape, Oxford) and Areas of Outstanding Natural Beauty in Chilterns (woodlands and chalk hills).

ANNEX 2 - THE TYPES AND CATEGORIES OF MANAGEMENT ACTIONS USED IN THIS STUDY

This Annex lists and briefly describes the 63 different types of entry-level management actions used in the typology and the analysis. A brief description of each type of action is given alongside an example of how these are specified within an RDP. Where individual examples have been quoted in Chapter 3 more detail has been given including the other actions that they are associated with when found in packages. The management actions are presented in the order that they are found in the typology.

1.1 The management of grass and semi-natural forage

This category of 14 different types of actions is aimed at the management of permanent pasture and semi-natural forage areas, grass leys within arable rotations and grass beneath or between permanent crops.

1.1.1 Maintain permanent pasture

This action describes the requirement to maintain existing areas of permanent pasture within a holding. **Example:** Poland - farmers are required to maintaining permanent pasture and all traditional features on their farms.

1.1.2 Traditional management (grass)

This action describes the requirement to maintain different types of traditional management and can refer to a variety of different practices which vary by RDP. **Example:** Bolzano (Italy) - farmers are required to carry out the care and maintenance of pastures according to traditional methods (which are not specified).

1.1.3 Grazing regime

This action describes the range of different requirements and limitations on the management of livestock and the vegetation on which they graze. These actions principally include limits to stocking densities and the dates at which livestock are allowed to graze.

Specific examples of grazing regimes used in this study

- **Reducing the negative impacts of agriculture on the environment – crop rotation in Slovenia:** This comprehensive package of actions requires farmers to maintain a livestock density of no more than 1.9LU/ha in part to ensure no excess manure is produced. Other requirements of this package include education and training for the farmer, the keeping of records, and inclusion of legumes in crop rotations alongside, limits to nitrogen fertiliser application to a maximum of 170kg per hectare per year.
- **Conservation of natural resources, biodiversity, soil fertility and traditional cultural landscape in mountain pastures in Slovenia:** Here the farmer must maintain livestock densities between a minimum of 0.5 and maximum of 1.9LU/ha. Other actions required of the farmer include the keeping of records, training, no use of sewage sludge or residue from farms, PPPs or fertilisers.
- **Basic commitments for the sustainable management of *dehesas* in Andalucía, Spain:** In this package farmers are required to maintain livestock densities between a minimum of 0.1 and maximum of 1LU/ha. This grazing regime is part of a wider package that also requires a management plan, records to be kept, scrub

management and compliance with a ban on the use of PPP. At the end of the grazing season farmers must also ensure than scrub and weeds are cleared by hand.

- **The management of manure fertilised pastures in Hamburg, Germany:** This package of actions, aimed at certain types of pastures, allows the farmer to graze up to a maximum of 2.5LU/ha between July and November. Requirements of this package centre largely on the dates at which certain operations can take place, for example the cutting and grazing of grassland can only take place between 1 July and 15 November. Additional date specific requirements include limits to fertiliser application and tillage regimes.
- **The management of pastures in the Czech Republic:** Requirements on grazing are specified in this package but only where it is appropriate to use grazing animals and to ensure stock are well managed. There is some inference of limits to grazing densities but these are associated with the requirement to limit the use of fertiliser applications (maximum 80kg nitrogen per hectare per year) and grazing animals.

1.1.4 Restrictions on peat cutting

This action describes the restrictions on the removal of peat for the use as a traditional fuel source. **Example:** Northern Ireland (UK) - farmers are limited to 0.1ha of peat cutting for domestic use only. Mechanised peat cutting is not permitted.

1.1.5 No grazing

This action describes management actions that exclude livestock grazing from certain areas of land. **Example:** Saarland (Germany) - in managing species-rich permanent grassland farmers are required to not carry out any grazing (except in special circumstances agreed with authorities).

1.1.6 No machinery

This action describes the exclusion of machinery from certain areas of land or for certain practices. **Example:** Romania – On certain types of grassland farmers are not permitted to carry out any operations with mechanical equipment, except that powered by animals.

1.1.7 Scrub or invasive species control

This action describes the management of scrub vegetation (usually woody species) as well as preventing the spread of some invasive species (usually non woody). **Example:** Finland - farmers must prevent the growth of trees and bushes on certain grassland areas.

1.1.8 Control of burning

This action prevents or restricts the time and way in which vegetation can be managed through burning. **Example:** Slovenia - in certain grassland areas farmers are prohibited from burning vegetation except for the removal of woody residues.

1.1.9 Restricted management dates (grass)

This action describes practices that restrict the periods and times of year over which certain management actions can take place on grassland. This is often required to protect wildlife during the breeding season **Example:** Madrid (Spain) – The farmer is not permitted to carry out any work during the breeding season of protected birds (dates are not specified).

1.1.10 Shepherding

This action describes the use of a shepherd to control livestock grazing in certain grassland areas. **Example:** Austria - in addition to other types of management actions on alpine pastures farmers are required to ensure a shepherd is present to manage livestock.

1.1.11 Hay making

This action describes the requirement to carry out haymaking in meadows and grassed areas. **Example:** UK (England) - farmers are paid a supplement to make hay in upland areas.

1.1.12 No Cutting

This action describes where farmers are prevented from carrying out any mowing or cutting of grass or vegetation. **Example:** Piedmont (Italy) - farmers are required not to carry out any mowing on extensive grazing areas.

1.1.13 Cutting regime

This action describes the requirement to carry out mowing or cutting either for a specified number of times or in a specific way (for example mowing from the centre to the edge of a field).

Examples of cutting regimes used in this study

- **The management of meadows in the Czech Republic:** In this package of actions no grazing requirements or restrictions are specified and the farmer is required instead to mow the meadows at least twice a year, remove cut material from the site, and not to mulch in Special Protection Areas (SPA).

1.1.14 Specified grass or seeding regime

This action describes the requirements to sow certain seed varieties. **Examples:** Ireland - farmers are required to incorporate clover into 25 per cent or 5 hectares, whichever is the lesser, of the grassland swards of the farm.

1.2 Input management

This group of actions describes the different approaches to limiting the use of inputs within a range of farming systems. These can include fertilisers, plant protection products (PPPs), growth regulators, and lime. Seven types of actions are included in this category.

1.2.1 No fertiliser application

This action describes where farmers are prohibited from using fertilisers on certain areas of their holding.

Examples of no fertiliser requirements used in this study

- **Reduced Inputs as a part of general management in Luxembourg:** Requires farmers to not use any fertiliser in certain areas, restrictions on the use of organic fertiliser, manure, sludge and compost as well as the analysis of soil nutrient content (every three years) and the keeping of records. It also stipulates that a farmer cannot purchase nitrogen from outside their farm if their own farm produces over 130 kg/ha a year of nitrogen. Other requirements of this package include the maintenance of

landscape features, maximum livestock density of 2 LU/ha, restricted management dates, and a 3 m buffer strip along riparian edges.

- **No inputs on arable land in Austria:** Under this package of actions the farmer is required not to use any herbicides or fertilisers with the exception of those listed in Annex II of Regulation 2092/91, including sewage sludge and sewage sludge compost. Seed inoculation is permitted. In this package farmers must also comply with a specific harvesting regime and take part in another package of actions (environmentally friendly management of arable land and grassland).

1.2.2 Limits to fertiliser application or specified regimes

This action describes where farmers are allowed to apply fertilisers to their holding but in doing so must comply with a minimum or maximum range (or both).

Examples of input management used in this study

- **The protection of endangered birds outside Natura 2000 areas in Poland:** In this package aimed at grassland areas farmers are required to carry out a comprehensive range of management actions from no tillage between 1 April and 1 September, keeping records of operations carried out on the holding, maintaining permanent pasture and landscape features, to cutting and grazing regimes compatible with bird protection. In terms of reduced inputs, the farmer must refrain from using PPP, sewage and sewage sludge as well as comply with the limits set out for fertiliser applications.
- **The improvement of soil quality through organic manure in Puglia, Italy:** This package is specifically designed to address organic matter content in soils. The farmer can apply fertiliser but is limited to a maximum of 250kg per ha per year of nitrogen in areas not vulnerable to nitrates, and 170kg per ha per year of nitrogen in those that are. The farmer must also document the soil organic matter content.
- **Traditional farming in mountain areas in Bolzano, Italy:** Here the farmer must adhere to an upper limit of fertiliser application of 30kg per ha per year of nitrogen. In addition, this small package of actions prohibits the use of pesticides and fertilisers, and requires keeping records of the species and variety of crops grown, previous crop, the crop cultivation, fertilisation, crop type and date of harvest.

1.2.3 No PPPs

This action describes where farmers are prohibited from using plant protection products (PPPs) on certain areas of their holding.

Example of input management used in this study

- **The protection of biodiversity and cultural values in pastures with general values (soil type 1) in Sweden:** Includes a ban on the use of pesticides, fertilisers and lime in combination with limits to grazing intensity, the control of scrub, implementation of a management plan and a ban on irrigation.

1.2.4 Limits to PPPs or specified regimes

This action describes where farmers are allowed to use PPPs on their holding but these are limited in application and scope. Quantities are rarely specified.

Example of limits to PPP application used in this study

Protection of traditional olive groves in Greece: farmers are permitted only to apply herbicides manually on permanent crops. This package does not specify the quantity of herbicide only the manner in which it may be applied. The farmer must also refrain from severe pruning and is prohibited from using machinery.

1.2.5 No lime application

This action describes where farmers are prohibited from using lime on certain areas of land. **Example:** Sweden – on certain types of pasture farmers are prohibited from applying lime.

1.2.6 Limits to lime or appropriate regime

This action describes where farmers are allowed to use lime on their holding but the application is limited. **Example:** England (UK) - for the management of upland grassland for birds farmers are allowed to continue to use lime on their land where this is normal practice but not between 1 April and 1 August.

1.2.7 No growth regulators

This action describes where farmers are prohibited from using growth regulators on their crops. **Example:** Estonia – on arable land in Estonia, as an optional requirement of a package aimed at environmentally friendly farming, farmers are not allowed to use growth regulators.

1.3 Management plans and record keeping

This category describes five types actions required of the farmer that involve activities away from the land concerned, such as management plans, record keeping and analysis.

1.3.1 Management plan - general

This action descries the requirements to set out a plan of operation for the holding or farm area outlining the environmental management to be implemented. **Example:** Lazio (Italy) – the farmer is required to commission an action plan, prepared by a qualified professional that should record the type, manner and timing of implementation of interventions. The plan should also include the identification of land parcels where different types of operations will be carried out.

1.3.2 Management plan – grazing

This action descries the requirements to set out a plan of operation for the holding or farm outlining that specifically relates to the use of grazing animals. **Example:** Abruzzo - farmers are required to establish a five-year grazing plan to encourage the renewal of grassland areas.

1.3.3 Management plan - input

This action describes where a farmer is required to set out a plan of operations for the holding or farm detailing the amount of inputs (fertilisers) to be used on the holding. **Example:** Bulgaria – farmers are required to prepare and implement a five year nutrient (input) management plan with support of an advisor or qualified agronomist).

1.3.4 Record Keeping

This action describes the requirements on farmers to maintain records of different types of actions undertaken on the farm. These often relate to fertilisation rates but also livestock management, or all actions on a holding. **Example:** Belgium (Flanders) - in relation to actions to help promote the reduction in use of pesticides the farmer is required to keep records of crop production including sowing or planting date for crops, progeny, anticipated harvest date and the method of weed control (mechanical and date).

1.3.5 Analysis

This action describes the requirement on farmers to take soil samples and carry out analysis to determine the appropriate level of nutrients required for fertilisation. This action usually precedes the implementation of an input management plan. **Example:** Bulgaria **–** to help in the protection of soil and water the farmer is required to take soil samples for analysis of nitrogen, phosphorous and potassium (with support of an advisor). This is carried out prior to the implementation of a five-year nutrient management plan.

1.4 Soil cover

This group of actions describes the different types of 'cover' required to limit the exposure of bare soils to erosion and run-off particularly during seasons when these events are more frequent. In addition some crop covers are used to provide forage and habitat for different fauna. Four types of action are found in this category.

1.4.1 Grass cover in permanent crops

This action describes the requirement to maintain grass cover under and between permanent crops at certain times of the year. **Example:** Austria - green cover must be maintained throughout the year on paths between fruit growing land.

1.4.2 Green or vegetated cover

This action describes the requirement to maintain a green cover crop on arable land, usually over winter.

Examples of green or vegetated cover used in this study

- **Plant cover to prevent the leaching of nutrients from soil to water in permanent crops in Umbria, Italy:** Here the farmer is required to implement a green manure crop within 20 days of harvesting the main crop and this must be maintained until 30 April the following year. The requirements include limits to PPPs, restricted tillage depth (25 cm), and the establishment of a management plan.
- **Winter intercrop in areas threatened by water erosion on arable land in Poland:** Here farmers are required to plant and maintain a cover crop over the winter period than must not be ploughed in before 1 March of the following year.

1.4.3 Over winter stubbles

This action describes the requirement to maintain stubbles on arable land, usually over winter (as opposed to being ploughed in immediately following harvest).

Example of over winter stubbles used in this study

- **Maintaining stubble in fields in Lithuania:** This package, aimed entirely at stubble management, requires the farmer to maintain stubbles on harvested fields over

winter. Straw can be baled or shredded and spread over the surface and light cultivation can be used to prevent weed build up, but only until 30 September. No fertilisers or PPPs can be applied after harvesting whilst the stubble is present. No ploughing-in dates are given.

1.4.4 Mulching regime

This action describes the requirement to mulch vegetation and leave it as a soil cover at certain times of year.

Examples of mulching regime used in this study

- **Conservation farming practices in Campania, Italy:** the farmer is required to maintain mulch on the soil as an alternative to vegetative (live) cover all year round. Cover must be established no later than 30 October and can be ploughed only after 30 March.

1.5 Soil management

This category of five actions is aimed specifically at the management and protection of soil under arable, grassland and permanent crop systems.

1.5.1 Erosion prevention strips

This action describes where farmers are required to create vegetated (usually grass) strips in-field for the purposes of preventing soil erosion and run off. Like run-off furrows (see below) these are most commonly required on sloping ground and are oriented perpendicular to the slope. **Example:** Sicily (Italy) – on arable land with a slope steeper than five per cent, farmers are required to create strips of land at least 5 m in width that are uncultivated, with permanent grass cover. These are used as an alternative to run-off furrows.

1.5.2 No tillage

This action describes where farmers are prohibited from carrying out any tillage (ploughing etc.) operations on certain areas of land.

Examples of no tillage used in this study

- **Protection of birds outside Natura 2000 sites in Poland:** farmers are prohibited from ploughing, rolling, under-sowing, or levelling between 1 April and 1 September. This wide package of actions also includes a ban on application of PPPs and sewage or sewage sludge, the maintenance of permanent pasture and landscape features, cutting and grazing regimes.
- **Erosion management through no tillage in Flanders, Belgium:** farmers are required to not carry out any tillage for a period of five to seven consecutive years on areas of the holding which are prone to erosion.

1.5.3 Tillage regime

This action describes where farmers are required to carry out tillage (ploughing etc.) in line with certain requirements which commonly include the orientation (in relation to the slope of the land) or depth of tillage.

Examples of different tillage regimes used in this study

- **Agricultural soil conservation, erosion control in Murcia, Spain:** In this package the farmer is prohibited from carrying out tillage in the direction of the slope irrespective of the incline. Other actions required in this package include riparian buffer strips and erosion prevention strips.
- **Reduced tillage depth on archaeological features in England:** Farmers are required to carry out reduced depth and non-inversion tillage (minimum tillage) to a maximum depth of 10cm. Farmers are also required not to sub-soil or mole plough. These actions do not necessarily cover the whole holding and can be limited to fields or areas containing archaeological features.

1.5.4 Runoff furrows

This action describes where farmers are required to create furrows or channels to prevent water running directly down sloping land and thus helping to prevent soil erosion. **Example:** Bulgaria - in order to help prevent soil erosion farmers are required to create run-off furrows arranged perpendicularly (and with a little inclination) to the slope with a distance between furrows of between 20 and 40 metres.

1.5.5 Ploughing-in of crop

This action describes the burying of crop residues to improve soil quality after they have been harvested or after the harvested stalks or cover has been left over winter.

1.6 Buffer strips

This category of actions describes the two types of action used to buffer features from the effect of damaging agricultural practices such as ploughing, the spraying of inputs (PPP, fertilisers) on adjacent habitats and features. Two actions are covered in this category.

1.6.1 Non-riparian buffer strips

This action describes the requirement on farmers to create or maintain a strip of land at the edge of a field providing a *buffer* to adjacent habitats or features such as hedgerows.

Examples of non-riparian buffer strips used in this study

- **Buffer strips package in Wallonia, Belgium:** This package devoted entirely to buffer strips requires the farmer to create buffer strips on their holding, in line with local constraints but between three and 21 metres wide. These must replace land that was under cultivation, have no fertiliser of PPP application, and cannot be mown.
- **Entry-level actions on viticulture in Greece:** This package, containing only two actions, requires farmers to have a minimum of 0.5m wide buffer strips and to carry out weeding through mechanical or manual means.

1.6.2 Riparian buffer strips

This action describes the requirement on farmers to create or maintain a strip of land at the edge of a field providing a *buffer* to adjacent aquatic features such as natural watercourses or ditches.

Examples of riparian buffer strips used in this study

- **Protection of areas sensitive to nitrates in Greece:** This package, aimed at protecting water from nitrates, requires farmers to have buffer strips on at least five per cent of their holding. Other requirements include taking 25 per cent of potentially irrigable land out of production, reducing fertiliser input by 30 per cent, and putting 20 per cent of the irrigable area into rotation every five years.
- **Creation of border strips in Denmark:** This package, exclusively aimed at the creation of buffer strips, requires farmers to create strips 10m to 20m wide immediately adjacent to lakes and watercourses. These can be cut back at least once a year but other than that have no further management requirement.
- **Environmentally friendly management in Estonia:** as part of this wider package of actions farmers are required to maintaining a buffer strip of between two and five metres. Other actions in the package include crop rotations, green cover, specified seed varieties, the production of a management plan and keeping of records.

1.7 Crop Management

This category describes the different actions used to manage both arable and permanent crops. Twelve types of action are included in this category.

1.7.1 Fallow

This action describes where farmers are required to include fallow as part of their standard crop rotations. **Example:** Cyprus - farmers are required as part of their rotations, to maintain one year of cereal and one year of fallow or leguminous crops.

1.7.2 Traditional management (crop)

This action describes the requirement to maintain different types of traditional management and can refer to a variety of different practices for example different ways of harvesting. **Example:** Scotland (UK) – farmers are required to gather their cereal crop using a 'binder' and the 'stooks' (groups of sheaves) are to be gathered into stacks.

1.7.3 Rotation with legumes

This action describes where farmers are required to have leguminous (nitrogen fixing) crops as part of their crop rotation. **Example:** See below – *Examples of crop rotations used in this study*.

1.7.4 Rotation

This action describes where farmers are required to have a certain number or types of crop in rotation.

Examples of crop rotations used in this study

- **Arable production package in Portugal:** As part of a package of actions aimed at arable production farmers are required to have a minimum of two crops in rotation over a five year period with exceptions granted for rice, floodplains, or terraced areas. The package does not specify the type of crops to be included in rotations but a separate action requires that the percentage of legume crops must not decrease. Farmers are also required to maintain landscape features alongside water courses, allow wildlife access to water between 1 May and 30 November, prohibit the use of

sewage sludge or animal manure (except from natural grazing), and ensure soil cover from 1 November to 1 March.

- **Species-rich crop rotation in agriculture and horticulture in Thüringen, Germany:** This package is focussed specifically on crop rotations and requires the farmer to maintain a minimum of six different crop types in rotation each with at least 10 per cent share of the arable area of the holding. The cereal content of the holding can not exceed two thirds of the overall crop share.
- **Diverse crop rotations in Bavaria, Germany:** This package is focussed entirely on crop rotations and again includes only two actions, crop rotations and rotation with legumes. The farmer is required to grow at least five different crops in rotation, with cereal crops not exceeding two thirds of the overall share and with legumes to cover at least five per cent of rotated crops.
- **Water-friendly agricultural use along waterways and sensitive areas in Bavaria, Germany:** This separate package of actions in Bavaria is focussed on water quality objectives although the only actions included are for crop rotations. Here the farmer is required to exclude intensive crops from rotations and to not allow the same crop to be grown in succession other than animal fodder crops.
- **Rotations in potato cultivation in Cyprus:** The farmer is required to maintain a three crop rotation for the cultivation of potatoes maintain one year of fallow, and use green manure over winter.
- **The management of agricultural systems of particular interest to populations of steppe birds in Andalucía, Spain:** In this package farmers are required to maintain legumes on at least 10 per cent of the holding, however this is only part of a much wider set of requirements aimed more specifically at bird management. These require a management plan, the keeping of records, harvesting restrictions until 30 June and to certain heights (minimum 25 cm), the maintenance of stubbles until 31 August, no irrigation, over winter stubble, strips, patches and infield fallow patches for birds.

1.7.5 Maintenance of traditional orchards

This describes where farmers are required to maintain traditional (fruit) orchards present on their holding through on-going management. **Example:** Hungary – farmers are required to maintain traditional apple orchards. These orchards are defined as a plantation which is composed of homogenous or mixed fruit trees with a density of at least 30 trees/ha and a maximum of 80 trees/ha.

1.7.6 Spring sown cereals

This action describes where farmers are required to sow cereal crops in the spring as opposed to the autumn or winter of the previous year. This usually follows the maintenance of stubble or soil cover over the winter period. **Example:** Ireland – farmers are required to plant a spring cereal crop on a minimum percentage of the holding with the added requirement that the crop cannot be harvested as whole crop silage.

1.7.7 Restricted management dates (crop)

This action describes practices that restrict the periods and times of year over which certain management actions can take place on arable land. **Example:** Andalucía (Spain) - in order

help protect certain bird species farmers are required to delay the harvest of cereal crops until 30 June.

1.7.8 No burning of straw, stubble or cut residue

This action prohibits the burning of cut residue, straw or stubble usually following harvest. **Example:** Ireland – when producing arable crops farmers are prohibited from burning straw or straw stubbles.

1.7.9 Pruning regime

This action describes the removal of shoots and dead vegetation from permanent crops. **Example:** Greece – farmers must avoid the severe pruning and decapitation of trees in traditional olive groves.

1.7.10 Specified crop varieties and/or seeding regime

This action describes where a farmer is required to plant certain varieties of crops or use certain seeding rate or method. This type of action is different from where farmers are required to plant certain types of crops as part of a rotation. **Examples:** Estonia – farmers are required to plant at least 15 per cent of the cultivated area (including at least 10 per cent under cereals) with a certified seed. Niedersachsen and Bremen (Germany) – farmers are required to sow oil seed rape before winter cereals at a seeding rate of 10-12kg/ha.

1.7.11 Restricted management times

This action describes the restriction to the specific times of day over which certain management actions can take place. **Example:** Spain (Catalunya) – farmers are not permitted to carry out agricultural work at night.

1.7.10 Harvesting regime

This action describes the requirement to carry out harvesting in a specific way (for example limiting the cutting height for certain crops). **Example:** Extremadura (Spain) - in order to protect nesting bird species the farmer must raise the cutting height at the time of harvest to a minimum of 25cm.

1.8 Landscape feature management

This category of actions describes the different types of landscape and structural features that are maintained or managed through entry-level actions. Two actions are covered in this category.

1.8.1 Management of water features

This type of action describes the management of aquatic landscape features such as ponds, streams, and ditches. **Example:** England – farmers are required to maintain existing ditches at the edges of fields. *For more details of how landscape feature management is included in packages of actions please see below.*

1.8.2 Management of non-aquatic features

This action describes the management of non-aquatic landscape features such as hedgerows, individual trees and stonewalls. **Example:** Ireland – farmers are required to maintain farm and field boundaries in accordance with a specific annual programme of

work. This maintenance will extend to 140 metres of hedgerow per hectare, subject to an overall maximum of 5,600 metres per farm. In the case of stonewall maintenance it will extend to 70 metres per hectare, with an overall maximum of 2,800 metres. *For more details of how landscape feature management is included in packages of actions please see below.*

Examples of where landscape feature management is the entire focus of a package of actions:

- **Landscape feature management in Wallonia, Belgium:** There are three separate packages of actions, each focussed on a different type of landscape feature. Package a) is focussed on hedgerows, package b) on trees, shrubs, and groves, and package c) on ponds. Each package commands a different payment rate and has a different set of requirements. For example, for hedgerow management farmers must declare and maintain all hedgerows, these must be composed of native species, be a minimum of 20 metres in length and maximum 10 metres in width, no fertilisers or PPPs may be used, and no maintenance carried out between 15 April and 1 July.
- **Management of landscape structural elements in Lithuania:** Under the 'Landscape Stewardship Scheme' one package is focussed entirely on the maintenance of structural landscape elements. This package is primarily aimed at the management of hedgerows and requires farmers to trim the hedges at least twice during the year, but not during the bird-breeding season (1 March to 31 July).

Examples of landscape feature management as part of a wider package of actions

- **Environmentally friendly management of grassland in Austria:** Farmers are required to carry out a range of actions within this package including limiting both fertiliser inputs (maximum 150kg nitrogen/ha) and livestock density (maximum 2LU/ha), complying with a cutting regime and keeping records, as well as the maintenance and management of landscape features.
- **Maintaining extensive Karst pastures in Slovenia:** Farmers are required to carry out a wide range of actions including (but not limited to) training, limiting livestock density between a minimum of 0.2LU/ha and a maximum of 1.9LU/ha, observing restrictions on management dates, no tillage, and limiting fertiliser application (no nitrogen fertilisers). As part of the package existing hedges must be maintained including pruning and thinning every other year but not between 1 March and 30 September.

1.9 Management for wildlife

This group of actions describes the areas within or adjacent to a crop or field of grass which are maintained solely for the purpose of providing forage, breeding, and nesting sites for different species.

1.9.1 Strips or patches for wildlife

This action describes the creation of areas for wildlife. These are usually found at the edge of arable fields but can include areas that protrude into the crop or where field corners are taken out of management.

Examples of strips or patches for wildlife used in this study

- **Environmentally friendly management of arable land in Austria:** Requires farmers to maintain flowering strips on at least two per cent of the arable area. This requirement is included within a wider package of actions which include limit to fertiliser application of 150kg N/ha, specified crop rotations, the keeping of records for farm operations and fertiliser application, maintenance of landscape elements, and cutting regimes on grass leys.
- **Nectar flower strips under entry-level stewardship in England:** Here farmers are required to sow nectar rich flower mixes, in blocks and/or strips at least 6m wide at the edges of fields, in early spring or late summer. On-going management of these strips requires restrictions on the use of fertilisers and PPPs, and grazing, as well as detailed cutting regimes (requirement to cut down to 10cm) between set dates of 15 September and 31 October.
- **The protection of farmland birds using mixed grass strips in Flanders, Belgium:** Here the farmer is required to sow a strip with a mixture of perennial grasses up to a maximum of 30m wide (minimum six metres) to create habitat for birds. On-going management of these strips places restrictions on the use of fertilisers and PPPs, as well as requiring detailed cutting regimes within set dates.
- **Blühflächen or flowering plant strips in Mecklenburg Vorpommern, Germany:** In this package of actions, aimed specifically at creating and maintaining flowering strips, the farmer is required to create a strip at least 10m wide (so that it can be checked using remote sensing), with no fertiliser. Farmers should also agree to the use of such strips by local beekeepers.

1.9.2 In-field fallow patch for wildlife

This action describes the creation of unsown plots or areas within a crop (or grass plot) aimed at providing nesting and forage areas for birds (eg skylarks).

Example of in field fallow patches used in this study

- **Skylark plots under entry-level stewardship in England:** Here farmers are required, in fields more than five hectares in area, to create plots within the crop at least three metres wide with a minimum area of 16m^2, at least 50m into the field and at a density of two plots per hectare. These plots can be created either by turning off the drill during sowing to leave an unsown plot, or by sowing the crop as normal and spraying out the plots by 31 December with an appropriate herbicide. There is no obligation to manage plots differently to the remainder of the field (they can be over sprayed and can be fertilised) but they cannot be weeded using mechanical means.

1.9.3 Sacrificial food crops for wildlife

This action describes where a farmer is required to leave part of the crop unharvested so as to provide food for wildlife. **Example:** Italy (Piedmont) - the beneficiary must leave the crop on the plot as food for wildlife, and apply no PPPs to the soil.

1.10 Water level management

This category describes one action concerned with the management of water levels within a field or parcel. This can refer to maintaining drainage systems to limit water build up on land or the converse where water levels are maintained on wetland habitats. **Example:** Bulgaria - for the maintenance of HNV grasslands no new drainage or ploughing is permitted.

1.11 Non chemical crop protection

This category describes three actions that aim to reduce the chemical input to agricultural systems through the use of alternative methods of control.

1.11.1 Mechanical or manual weed control

This action describes the control of weeds or unwanted vegetation manually (for example hand cutting or pulling) or mechanically (for example machine pulling of weeds). **Example:** Greece - manual weed control in vineyards.

1.11.2 Mechanical pest control

This action describes the use of a system of traps to control pests. **Example:** Spain (Catalunya) - the beneficiary must implement a system of traps to control pests in vineyards.

1.11.3 Biological pest control

This action describes the use of either pheromones or other species to control pest species. **Example:** Bavaria (Germany) – farmers are required to use predatory mites in place of fungicides under a package of actions that prohibits the use of PPPs.

1.12 Land out of production

This category contains two actions that require land to either be taken or maintained out of production.

1.12.1 Taking land out of production

This action describes where farmers are required to take areas of currently farmed land out of the productive cycle for more than one year.

Examples of taking land out of production used in this study

- **Protection against erosion in fruit and hop growing areas in Austria:** In order to enhance soil functionality land can be taken out of production for a maximum of three years; vines must be removed and green cover maintained all year.
- **Protection of water systems in Greece:** farmers are required to take out of production a minimum of 25 per cent of potentially irrigated land with no agricultural practice allowed for five years. On other areas farmers must establish crop rotations on a minimum of 20 per cent of the holding and buffer strops on five per cent.
- **Maintenance of habitats in Bulgarian arable lands of important bird areas:** This package is designed to support protected bird species in Bulgaria as part of the High Nature Value (HNV) farming package. It requires a contiguous area between 10 and 20 per cent of the overall holding (minimum one hectare) of arable land to be left uncultivated for a period of two to five years. The area of unfarmed land must be rotated. The farmer must maintain a buffer strip at least one metre in width that can be ploughed two to three times a year (but not between March and July) to prevent spread of weeds into adjacent crops.

1.12.2 Examples of maintaining areas of land out of production

This action describes where farmers are required to maintain existing areas of land that are currently not in production for more than one year.

Examples of maintaining areas of land out of production used in this study

- **Retaining wildlife areas in Ireland:** Farmers are required to nominate a minimum of three per cent of the farm (grassland farms) or two per cent of the farm (arable farms) for wildlife habitat. This compulsory action is supported by additional optional actions (paid for separately) including the creation of strips or patches for wildlife (which include the prohibition of fertilisers and PPPs) as well as higher-level actions including tree planting and habitat creation.

1.13 Apiculture

This category, and the one action it contains, describes all the different activities associated with bee keeping (apiculture). **Example:** Castile y Leon – under a package of actions called '*bee keeping to improve biodiversity*' farmers the range of requirements include identifying all hives used on their holding, maintain a hive density of no more than one every two hectares, have more than 80 colonies on the holding and applying integrated management for pests such as Varroa mite.

1.14 Irrigation Management

This category describes where farmers are required to carry out more appropriate management of water in agricultural systems through irrigation practices. Two types of actions are included in this category.

1.14.1 Irrigation management

This action refers to the management of irrigation practices. **Example:** Portugal – farmers are required to carry out careful water management on irrigated crops.

1.14.2 No irrigation

This action refers to the prohibition of irrigation. **Example:** Sweden – to protect the soil's natural values farmers are not allowed to carry out any irrigation.

1.15 Training

This category includes only one type of action and refers to where farmers are required to undertake training as part of their agri-environment agreement.

Examples of training used in the main report

- **Training required for farmers undertaking environmental management in Slovenia:** In the Slovenian RDP, all 14 packages of actions recorded in this study require the farmer to undertake training. For example **Conservation of natural resources, biodiversity, soil fertility and traditional cultural landscape – mowing steep pastures in Slovenia:** This package of actions requires the farmer, for the duration of their contract, to carry out an educational programme of not less than four hours per year, following which they should receive a certificate confirming the education and the number of hours undertaken. Other actions within this package include the keeping of records for all actions (not just fertilisers and PPPs); refraining from using sewage sludge and farm residues or producing excess livestock manure; complying

with a maximum livestock density of 1.9LU/ha; cutting grass at least once per year using specific machinery or by hand; and ensuring that nitrogen fertiliser application does not exceed 170kg per hectare per year.

- **Compulsory training in Ireland:** As a compulsory requirement farmers must undertake training in environmentally friendly farming practices so that they can acquire the knowledge and skills to comply with the core requirements of the Ireland agri-environment scheme. Participants must attend a formal training course provided with Axis 1 support before the end of the second year of their agri-environment contract. This compulsory action is one of 12 compulsory actions and packages of actions within the scheme, including buffer strips, management plans and limits to fertilisers and PPPs.
- **Training for farmers of fruit nurseries in Luxembourg:** farmers are required to undertake training for the first three years of their agreement of a minimum of 10 hours (five two hour classes). In addition to this they must maintain structural elements (landscape features), limit fertiliser application and keep records of its use, analyse soil nutrient content (except nitrogen) and maintain perennial green cover between permanent crops.

ANNEX 3 - THE BIO-GEOGRAPHICAL DIFFERENCES OF THE EU-27

To help with an understanding of the bio-geographical variation of the 88 RDPs this annex lists in Member State alphabetical order the 88 RDPs of the EU including their broad bio-geographical region (Table A3.1), the source of this information (Figure A3.1), as well as providing a more detailed description of the seven outer most regions (Box A3.1).

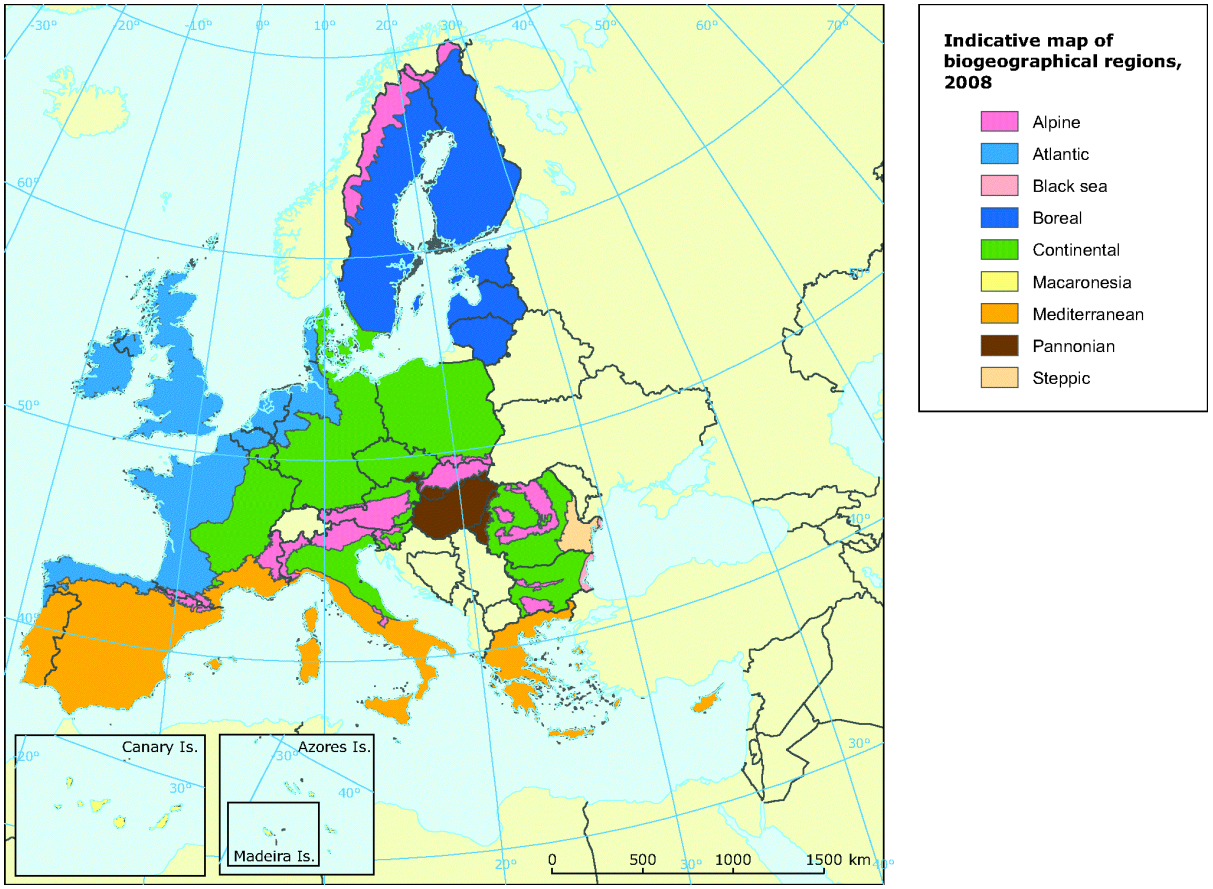
Table A3.1: Member States and regions and their associated bioclimatic zones

Country	EU Code	Region	MS Group	Broad Bio-climatic Region
Austria	AT	-	EU-15	Alpine
Belgium	Be (Fl)	Flanders	EU-15	Atlantic
Belgium	BE (WA)	Wallonia	EU-15	Continental
Bulgaria	BG	-	EU-12	Continental
Cyprus	CY	-	EU-12	Mediterranean
Czech Republic	CZ	-	EU-12	Continental
Denmark	DK	-	EU-15	Continental
Estonia	EE	-	EU-12	Boreal
Finland	FI	Mainland	EU-15	Boreal
Finland	FI (Al)	Region of Aland	EU-15	Atlantic
France	FR (Co)	Corsica	EU-15	Mediterranean
France	FR	Hex	EU-15	Atlantic
France	FR (Gua)	Guadeloupe	EU-15-OR	Caribbean
France	FR (Re)	Reunion	EU-15-OR	African
France	FR (Gu)	Guiana	EU-15-OR	South American
France	FR (Ma)	Martinique	EU-15-OR	Caribbean
Germany	DE (Bw)	Baden Wurttemberg	EU-15	Continental
Germany	DE (Ba)	Bavaria	EU-15	Continental
Germany	DE (Bra/Be)	Brandenburg and Berlin	EU-15	Continental
Germany	DE (Ha)	Hamburg	EU-15	Continental
Germany	DE (He)	Hessen	EU-15	Continental
Germany	DE (MV)	Mecklenburg Vorpommern	EU-15	Continental
Germany	DE (Ni/B)	Niedersachsen and Bremen	EU-15	Continental
Germany	DE (NW)	Nordrhein-Westfalen	EU-15	Continental
Germany	DE (RP)	Rhineland Pfalz	EU-15	Continental
Germany	DE (Saa)	Saarland	EU-15	Continental
Germany	DE (Sac)	Sachsen	EU-15	Continental
Germany	DE (SH)	Schleswig-Holstein	EU-15	Atlantic
Germany	DE (SA)	Sachsen-Anhalt	EU-15	Continental
Germany	DE (Th)	Thuringen	EU-15	Continental
Greece	EL	-	EU-15	Mediterranean
Hungary	HU	-	EU-12	Pannonian
Ireland	IE	-	EU-15	Atlantic
Italy	IT (Ab)	Abruzzo	EU-15	Continental
Italy	IT (Bas)	Basilicata	EU-15	Mediterranean

Italy	IT (Bo)	Bolzano	EU-15	Alpine
Italy	IT (Cal)	Calabria	EU-15	Mediterranean
Italy	IT (Cam)	Campania	EU-15	Mediterranean
Italy	IT (La)	Lazio	EU-15	Mediterranean
Italy	IT (ER)	Emilia Romagna	EU-15	Continental
Italy	IT (FVG)	Friuli Venezia Giulia	EU-15	Continental
Italy	IT (Li)	Liguria	EU-15	Mediterranean
Italy	IT (Lo)	Lombardia	EU-15	Continental
Italy	IT (Ma)	Marche	EU-15	Continental
Italy	IT (Mo)	Molise	EU-15	Mediterranean
Italy	IT (Pi)	Piedmont	EU-15	Continental
Italy	IT (Pu)	Apuilia (Puglia)	EU-15	Mediterranean
Italy	IT (Sa)	Sardegna	EU-15	Mediterranean
Italy	IT (Si)	Sicily	EU-15	Mediterranean
Italy	IT (To)	Toscana	EU-15	Mediterranean
Italy	IT (Tr)	Trento	EU-15	Alpine
Italy	IT (Um)	Umbria	EU-15	Mediterranean
Italy	IT (VdA)	Valle d'Aosta	EU-15	Alpine
Italy	IT (Ve)	Veneto	EU-15	Continental
Latvia	LV	-	EU-12	Boreal
Lithuania	LT	-	EU-12	Boreal
Luxembourg	LU	-	EU-15	Continental
Malta	MT	-	EU-12	Mediterranean
Netherlands	NL	-	EU-15	Atlantic
Poland	PL	-	EU-12	Continental
Portugal	PT	Mainland	EU-15	Mediterranean
Portugal	PT (Az)	Azores	EU-15-OR	Macronesia
Portugal	PT (Ma)	Madeira	EU-15-OR	Macronesia
Romania	RO	-	EU-12	Continental
Slovakia	SK	-	EU-12	Alpine
Slovenia	SI	-	EU-12	Continental
Spain	ES (Bl)	Balearic Islands	EU-15	Mediterranean
Spain	ES (BC)	Basque Country	EU-15	Atlantic
Spain	ES (Cant)	Cantabria	EU-15	Atlantic
Spain	ES (CyL)	Castilla y Leon	EU-15	Mediterranean
Spain	ES (Ex)	Extremadura	EU-15	Mediterranean
Spain	ES (GA)	Galicia	EU-15	Atlantic
Spain	ES (Ma)	Madrid	EU-15	Mediterranean
Spain	ES (an)	Andalucia	EU-15	Mediterranean
Spain	ES (AR)	Aragón	EU-15	Mediterranean
Spain	ES (As)	Asturias	EU-15	Atlantic
Spain	ES (ClM)	Castilla la Mancha	EU-15	Mediterranean
Spain	ES (Cat)	Catalunya	EU-15	Mediterranean
Spain	ES (LaR)	La Rioja	EU-15	Mediterranean

Spain	ES (Mu)	Murcia	EU-15	Mediterranean
Spain	ES (Na)	Navarra	EU-15	Mediterranean
Spain	ES (Va)	Valencia	EU-15	Mediterranean
Spain	ES (Cana)	Canaries	EU-15-OR	Macronesia
Sweden	SE	-	EU-15	Boreal
United Kingdom	UK (EN)	England	EU-15	Atlantic
United Kingdom	UK (NI)	Northern Ireland	EU-15	Atlantic
United Kingdom	UK (W)	Wales	EU-15	Atlantic
United Kingdom	UK (Sc)	Scotland	EU-15	Atlantic

Figure A3.1: Indicative map of bioclimatic regions in Europe (2008)



Source: EEA, 2006
http://ec.europa.eu/environment/nature/natura2000/sites_hab/biogeog_regions/maps/biogeo_map_eur27.pdf

Box A3.1: Outermost regions of the European Union

The EU has nine regions that are geographically very distant from the European continent but that still form an integral part of the EU Member States to which they belong. Known as the 'outermost regions', they are covered by EU law and the other rights and duties associated with EU membership – in contrast to overseas territories, which have a different legal status. The nine outermost regions are:

- Four French *départements* – Martinique, Guadeloupe, French Guiana and Réunion and two French collectivités d'outre-mer – Saint-Barthélemy, Saint-Martin
- Two Portuguese autonomous regions – Madeira and the Azores - Açores 2010
- One Spanish autonomous community – the Canary Islands

In the Treaty on the Functioning of the European Union, the outermost regions are covered by Article 349, which recognises that EU policies must be adjusted to their special circumstances.

REGION	LOCATION	CAPITAL	SURFACE AREA KM^2	POPULATION	PER CAPITA GDP (EU=100)
AZORES	Atlantic	Ponta Delgada	2,333	237,900	66.7
CANARIES	Atlantic	Las Palmas	7,447	1,715,700	93.7
GUADELOUPE	Caribbean	Pointe-à-Pitre	1,710	425,700	70.6
FRENCH GUIANA	South America	Cayenne	84,000	161,100	50.5
MADEIRA	Atlantic	Funchal	795	244,800	94.9
MARTINIQUE	Caribbean	Fort-de-France	1,080	383,300	75.6
RÉUNION	Indian Ocean	Saint-Denis	2,510	715,900	61.6
SAINT-BARTHÉLÉMY*	Caribbean	Gustavia	25	8,300	111
SAINT-MARTIN*	Caribbean	Marigot	53	35,000	61.9

** There is no Rural Development Programme for these two outermost regions*

Source: ***http://ec.europa.eu/regional_policy/themes/outermost/index_en.htm***

ANNEX 4 - DEVELOPMENT OF GAEC STANDARDS IN FRANCE 2006-2010

In France, GAEC standards were fixed by decree 2004-1429 on 23 December 2004 and by the law of 12 January 2005, and were aimed at the prevention of soil erosion, the protection of soil structure, the maintenance of organic matter level and ensuring a minimum level of land maintenance.

GAEC standards were developed from existing rules like the codes of good agricultural practices that had already existed for years in most of the French departments, as well as regional rules attached to payments for set-aside land and Less Favoured Areas.

GAEC in 2005

In 2005 the French authorities defined six GAEC standards which were nationally applicable:

GAEC 1: Implementation of a minimum environmental area at holding level. This GAEC is concerned with soil erosion issues. Three per cent of the area declared in cereals, oilseed crops, flax/hemp and set-aside, has to have environmental cover. This has to be maintained as a priority along streams to a minimum of five metres during the period from 1 May to 31 August. Elsewhere, the minimum area of this ecological infrastructure is 0.05 ha. Set-aside, pasture and grassland can be counted as environmental cover. Small producers are not obliged to follow these rules.

GAEC 2: Prohibition of stubble burning. This requirement consists of not burning straw or crop residues, to protect the organic matter of the soil and to avoid its impoverishment. It applies to all the farmers applying for SPS and concerns the totality of their land that is in cereal and oilseed crops. Rice producers are not included in this requirement. In exceptional cases (to solve phytosanitary problems), derogations have to be obtained at prefectural level.

GAEC 3: Diversity of crops cultivated. At least two crop families or three different crops have to be grown on at least five per cent of the area; this requirement is linked to the organic matter issues. Non-cultivated set-aside, permanent pastures and permanent crops are not counted in this calculation. All farmers receiving SPS are included, except those with systems entirely of temporary meadows, or with other monoculture systems of production (of more than 95 % specialization). In those specific cases, they are obliged to plant winter cover.

GAEC 4: Rules relating to irrigated crops. The objective of this GAEC is to ensure good irrigation control to preserve soil structure and avoid compaction and erosion of topsoil.

GAEC 5: Minimum level of maintenance of land. The aim of this standard is to maintain land (cultivated or not) in good agronomic and sanitary conditions (avoiding weed, pest and scrub invasion) in order to protect the production potential of the land. There are three categories of land:

- Land in crop production (cereals, oilseed crops and nut orchards): this land must be entirely sown and maintained until the flowering of the crop, in conformity with local practice.
- Pastures: criteria have to be defined at the local level and must specify the minimum density of animals per ha, and requirements for grazing, mowing or cutting;
- Land set-aside (compulsory or voluntary): the requirements concern the minimum maintenance of land, the type of cover (spontaneous or sown), with specific

requirements for meadows, fertilisation, succession of crops and set-aside, and the specific requirements for environmental set aside.

9 **GAEC 6: Maintenance of permanent pastures.** This concerns the maintenance of the proportion of permanent grassland in the UAA at national level. It applies to all farmers benefiting from direct aids and having permanent meadows.

Changes over the next 3 years

In 2006, three main improvements were made:

- the definition of streams requiring grass buffer strips;
- the definition of a new category of land for GAEC 5: lands not in production; and
- the integration of the notion of 'small producers', which no longer existed in the EC Regulations.

In 2007, the application conditions of GAEC 1 and 3 were specified; and GAEC 5 (the minimum level of maintenance of land) was extended to olive groves as well as orchards.

In 2008, the fruit and vegetable sector was integrated into GAEC 5 and only minor modifications were made to other GAEC standards.

In 2009, GAEC standards were adapted to the requirements of sustainable development, in particular to favour biodiversity. GAEC 1, 3 and 5 were modified:

- GAEC 1: the list of permitted environmental cover was enlarged; hedges were included in the calculation of the area under environmental cover; crushing and mowing was not permitted before certain dates;
- GAEC 4: the licensing requirements for pumping water, and methods of calculating volumes were extended to various crops;
- GAEC 3: the diversity of crops was redefined as planting *either* three different crops representing 5 % or more of the cultivated land (3 % was accepted for the third crop), *or* two different crops, of which one was either temporary grass or a pulse crop and represented 10 % or more of cultivated land.

A revised set of standards in 2010

In 2010, GAEC changed again and seven standards have now been implemented:

GAEC I: Buffer strips along water courses (*this new GAEC contains some of the requirements of former GAEC 1*):

Buffer strips must be implemented along water courses, with a minimum width of 5 metres of permanent cover throughout the year. Requirements for the maintenance and use of buffer strips are strict: no agricultural inputs, no irrigation, no ploughing, but mowing and grazing are allowed (rules for access of animals to the water course).

GAEC II: Prohibition of stubble burning (*this new GAEC contains some of the requirements of former GAEC 2*):

This requirement consists of not burning straw and crop residues, to protect the organic matter of the soil and avoid its impoverishment. Rice producers are not covered by this requirement.

GAEC III: Diversity of crops cultivated (*this new GAEC contains some of the requirements of former GAEC 3*):

Two options are possible:

- establishment of at least three different crops each representing 5 % or more of the cultivated land (but 3 % is acceptable for the third crop), or
- two different crops, of which one is either a temporary grassland or a pulse crop and represents 10 % or more of the cultivated land (an alternative is acceptable, of planting winter cover and/or managing crop residues).

GAEC IV: Pumping water for irrigation, extended to all cultivated land;

Two requirements are defined:

- the licensing requirements for pumping water and
- methods of estimating volumes.

GAEC V: Minimum maintenance of land (*this new GAEC contains some of the requirements of former GAEC 5*):

Two categories of land are defined:

- Land in crop production (cereals, oilseed crops and nut orchards): this land must be entirely sown and maintained until the flowering of the crop and in conformity with local practice;
- Land set-aside: prohibition of bare soil, establishment of cover (spontaneous or sown), prohibition of fertilising spontaneous cover, maximum of 50 kg of total nitrogen per hectare to establish cover, rules for mowing.

GAEC VI: Management of grasslands_(*this new GAEC contains some of the requirements of former GAEC 6*);

Three requirements are defined:

- overall maintenance of grassland at farm level: 50% of reference area (2010) for temporary grass, 100% for permanent grass;
- minimum productivity of forage area: minimum density of livestock of 0.2 LU/ha or a minimum yield of forage (details may vary locally);
- maintenance of the permanent pasture ratio, with 2005 as the reference year.

GAEC VII: Retention of landscape features (*this new GAEC contains some of the requirements of former GAEC 1*):

- permanent elements of landscape must cover 1% of UAA (achieved by new planting if necessary).

ANNEX 5 - EXAMPLES OF FERTILISER AND PPP REQUIREMENTS DEFINED UNDER ARTICLE 39(3) OF REGULATION 1698/2005

Table A5.1: Examples of fertiliser and PPP requirements defined under Article 39(3) of Regulation 1698/2005

case study	Fertilisers	PPP
FR	Two specific complementary requirements on fertilisers and PPP were defined for beneficiaries of agri-environment measures, for contracts signed from 2007: fertilisation practices with four requirements: (1)existence of a fertilisation plan for manure, (2)existence of a logbook of practices applied, (3)absence of water pollution by nitrates and (4)existence of an overall balance of nitrogen fertilization in vulnerable areas;	use of crop protection products with five requirements: (1) keeping a register of plant protection products, (2)delivery of the empty packaging and unused plant protection products to recovery centres,, (3) periodic checking of the sprayer, (4) regulatory compliance in untreated areas and (5) use of authorized distributors for the purchase of plant protection products. In 2008, checking the sprayers was not compulsory for the specific complementary requirements on fertilization practices.
IT	<u>Minimum requirements for nitrate fertiliser use in non-vulnerable zones</u> Adoption of the code of good agricultural practices (Ministerial Decree 19/04/1999) General technical criteria and requirements for the use of livestock effluents (Ministerial Decree 7/04/2006), regional decrees expected <u>Minimum requirements for phosphates fertiliser use</u> General technical criteria and requirements for the use of livestock effluents (Ministerial Decree 7/04/2006), expectant the regional decrees Legislative Decree n. 99/92 on the use of sewage sludge in agriculture - requirements for water protection areas (art. 94 of legislative decree 152/2006) - requirements included in the Water District Plans (art. 64 and 65/5 of legislative decree 152/2006)	Minimum requirements for plant protection product use - farmer must have a special licence for the use of PPP - farmer must follow a training course - storage of PPP must be secure - spraying machinery must be periodically checked - requirements for the use of PPP near watercourses or other sensitive areas (D.P.R. n. 236/1988 and art. 93 legislative decree 152/2006 concerning plant protection products vulnerable areas)

UK England	In NVZs – comply with revised Nitrates Action Programme (2009) Outside NVZs - comply the Code of Good Agricultural Practice for the Protection of Water	Plant Protection Products (Basic Conditions) Regulations 1997 set out rules for the training of all those who use, sell, supply and store pesticides. In addition, there are two statutory codes of Practice: the Code of Practice for using Plant Protection Products, and the Code of Practice for suppliers of Pesticides to Agriculture, Horticulture and Forestry
UK Scotland	New verifiable standards for 2010: sanctions can be applied if: - there is evidence that inorganic (chemical) or organic (manure, slurry, etc.) fertilisers are stored on land that is within 10 metres of any surface water or wetland; within 50 metres of any well, spring or borehole; waterlogged; where soil is shallow; - application of inorganic or organic fertilisers poses a risk of pollution to the water environment - there is evidence that inorganic fertiliser was applied to land within 2 metres of any surface water or wetland and/or within 5 metres of a well, spring or borehole; - there is evidence that organic fertiliser was applied to land within 2 metres of an artificial drainage ditch, within 5 metres of any other surface water or wetland, within 50 metres of a well, spring or borehole, or with an overall gradient more than 15 degrees.	New verifiable standards for 2010: sanctions can be applied if: - there is evidence of practices that could result in spillages and washings entering the water environment during preparation of pesticide for application, cleaning or maintenance of pesticide sprayers. - spraying equipment is filled from the water environment without a method to prevent back siphoning, or the use of an intermediate container. - pesticide store does not meet the requirements for safe storage (made of easily cleaned materials; kept locked when not in use; dry, with no drain pipes or water supply in the store; insulated and/or heated to provide frost protection; ventilated; identified with appropriate warning signage; and capable of containing any spillages to the capacity of 110% of the maximum store contents.

ANNEX 6 – EXAMPLES OF PAYMENT CALCULATIONS

Table A6.1: Payment calculations for Bulgaria

Scheme	**HNV 1: Restoration and maintenance of under-grazed HNV grasslands**	
Summary of the required management	Cut grasslands: • Limits to fertiliser application; • Limits to pesticide application; • No new drainage permitted; • No ploughing permitted; • Grazing regime (free grazing on meadows after the last mowing except for meadows in forests); • Cutting regime within fixed dates (between 15 June and 15 July for lowlands and between 30 June and 15 August for mountainous LFAs). Cutting can be either manual or mechanical (as long as it does not disturb nesting birds). Grazed grasslands: • Limits to fertiliser application; • Limits to pesticide application; • No new drainage permitted; • No ploughing permitted; • Grazing regime for entire grazing area (livestock density must be between 0.3 and 1.5 LSU/ha). *Requirements: the farmer must specify each year whether the grassland will be cut or grazed.*	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Income foregone for shortening the grazing period	-	
Income foregone for cutting regime	-	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**97**
Additional costs		
N/A	Nil	
Total additional costs		Nil
Net cost		**97**
Transaction costs		Nil
Payment rate (100% of net costs)		**97**

Scheme	SW 1: Crop rotations for soil and water protection	
Summary of the required management	• Limits to fertiliser and pesticide applications (includes soil samples and a 5 year Nutrient Management Plan); • Crop rotation (4-crop rotation; maintain winter crops on a minimum 50% of area under crop rotation); • Restricted management dates (must not cultivate before 1 April).	
Elements of payment calculation	**EUR/ha**	
Income foregone		
N/A	Nil	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**Nil**
Additional costs[92]		
Seeds	-	
Preparation of the soil and sowing	-	
Ploughing of the winter cover	-	
Total additional costs		76
Net cost		**76**
Transaction costs		Nil
Payment rate (100% of net costs)		**76**

Scheme	SW 2: Soil erosion control
Summary of the required management	The farmer may choose to apply one or several of these activities listed: • In field grass buffer strips (4-8 m wide, running perpendicularly to the slope, between 20-80 m apart from each other, covering between 10-30% of the total arable area); • Cover crops; • Run-off furrows (30-100 m wide, running perpendicular to the slope, between 20-40 m apart from each other);

[92] Additional costs for soil sampling and preparation of Nutrient management plans are not taken into account since it is assumed that they will be done by the National Agricultural Advisory Service (NAAS) free of charge.

	• In field crop buffer strips (30-100 m wide, running perpendicular to the slope, with alternating earthed-up crops planted on the contour); • Grazing regime (extensive management, limited livestock density to less than 2 LU/ha); • Improvement of pastures: clear debris (including stones and unwanted vegetation); partial sowing and nutrition of the pastures. *Requirements: farmer must have a 5 year anti-erosion plan.*	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Income foregone for the transformation of the arable land to pasture	-	
Savings		
Reduced fertiliser usage	-	
Additional incomes from: hay from pastures (following conversion from arable to pasture)	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Additional cultivation – grass cutting, sowing, soil packing, ploughing, etc.	-	
Seeds	-	
Grassing of buffer strips	-	
Marking of furrows and machine time needed for their tracing	-	
Improvement of grass cover and it productivity	-	
Cleaning pastures from stones	-	
Total additional costs	-	
Net cost		**74**
Transaction costs		Nil
Payment rate (100% of net costs)		**74**

Table A6.2: Payment caluclations for Czech Republic

Scheme	**Meadows (B1)**	
Summary of the required management	• Limits to fertiliser application (no more that 60 kg N/ha/year); • Prohibition of slurry (except for cattle slurry); • Cutting regime (minimum 2 cuts/year and removal of mown biomass).	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Gross margin on meadows with typical level of fertilising (80 kg N/ha)	219	
Gross margin on meadows with reduced level of fertilising (40 kg N/ha)	144	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**75**
Additional costs		
N/A	Nil	
Total additional costs		Nil
Net cost		**75**
Transaction costs		Nil
Payment rate (100% of net costs)		**75**

Scheme	**Pastures (B7)**	
Summary of the required management	• Limits to fertiliser application (no more that 80 kg N/ha/year); • Prohibition of slurry (except for cattle slurry which must be between 5 and 55 kg N/ha); • Grazing regime (including technical or organisational arrangements on pastures to prevent animals escaping); • Cutting regime (does not apply to land with a slope of more than 10°); • Limits to herbicide application; • Provision of water for animals.	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Gross margin for cattle production	422	

Income foregone from reduced production	105	
Savings		
Cost savings for fertilisers	13	
Total savings		13
Total income foregone		92
Additional costs		
Additional costs for weed removal by spot application of herbicides	8	
Additional costs for mowing of ungrazed patches after end of the grazing period	12	
Total additional costs		20
Net cost		**112**
Transaction costs		Nil
Payment rate (100% of net costs)		**112**

Scheme	**Landscape (C1)**	
Sub scheme	***Conversion of arable land to grassland (C1.1)***	
Summary of the required management	• Cover crop (seed mix or undersown cover crops sown within fixed dates); • No fertiliser application or grazing in the first year of conversion; • Cutting regime (minimum 2 cuts/year within fixed dates unless approved otherwise; removal of mown biomass); • Grazing regime (within fixed dates); • Manual or mechanical weed control: herbicides (spot application only) permitted only in the first two years after conversion and are prohibited for organic farmers; • Nitrogen containing fertilisers, livestock manure and treated sludge are prohibited. *Requirements: applies to a minimum area of 0.1 ha; arable areas that had in the past been registered as grassland in the LPIS may not enter to this scheme.*	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Gross margin – arable land	294	
Gross margin – grassland	85	
Savings		

N/A	Nil	
Total savings		Nil
Total income foregone		209
Additional costs		
One-off cost for grassing and grass seed (recalculated as annual cost over 5 years)	49	
Additional costs for supplemental sowing	12	
Total additional costs		61
Net cost		**270**
Transaction costs		Nil
Payment rate (100% of net costs)		**270**
Sub scheme	***Conversion of arable land to grassland (C1.2)***	
Summary of the required management	• See sub scheme C1.1. above	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Gross margin – arable land	294	
Gross margin – grassland	85	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		209
Additional costs		
One-off cost for grassing and grass seed (recalculated as annual cost over 5 years)	49	
Additional costs for supplemental sowing	12	
Additional costs for equipment	24	
Total additional costs		85
Net cost		**295**
Transaction costs		Nil
Payment rate (100% of net costs)		**295**
Sub scheme	***Conversion of arable land to grassland with regional mix of seeds (C1.3)***	
Summary of the required management	• Cover crop (specified seed mix that has been certified by regional authority) • See sub scheme C1.1. above	
Elements of payment calculation	**EUR/ha**	
Income foregone		

Gross margin – arable land	294	
Gross margin – grassland – recalculation	85	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		209
Additional costs		
One-off cost for grassing and grass seed (recalculated as annual cost over 5 years)	112	
Additional costs for supplemental sowing	28	
Total additional costs		140
Net cost		**349**
Transaction costs		Nil
Payment rate (100% of net costs)		**349**
Sub scheme	***Conversion of arable land to grassland with regional mix of seeds and riparian buffer strips (C1.4)***	
Summary of the required management	• Riparian buffer strip (minimum 15 m wide); • See sub scheme C1.1. above	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Gross margin – arable land	294	
Gross margin – grassland	85	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		209
Additional costs		
One-off cost for grassing and grass seed (recalculated as annual cost over 5 years)	112	
Additional costs for supplemental sowing	28	
Additional costs for equipment	25	
Total additional costs		165
Net cost		**374**
Transaction costs		Nil
Payment rate (100% of net costs)		**374**

Scheme	**Cover crops (C2)**

Summary of the required management	• Annual crop rotation that must include a specified catch crop in specified areas, sown within fixed dates; • Sow over winter crops; • No chemical or mechanical operations leading to a liquidation of the catch crop or to a reduction of the area under the catch crop shall be made before a set date. After that date a main crop shall be established.	
Elements of payment calculation	**EUR/ha**	
Income foregone		
N/A	Nil	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**Nil**
Additional costs		
Additional costs for seed	32	
Additional costs for sowing catch crops	53	
Additional costs for removal of catch crops	19	
Total additional costs		104
Net cost		**104**
Transaction costs		Nil
Payment rate (100% of net costs)		**104**

Table A6.3: Payment calculation for Finland

Scheme	**Environmental planning and monitoring of farm practices**	
Summary of the required management	The management is the same for different farming systems but the payments vary: • Annual cultivation plan (showing crop type and fertiliser application); • Soil samples every 5 years.	
Elements of payment calculation	**EUR/ha**	
Income foregone		
N/A	Nil	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**Nil**
Additional costs		
Additional costs for man power	-	
Additional costs for computer software	-	
Total additional costs - arable		46.20
Total additional costs – dairy		49
Total additional costs - horticulture		161.70
Net cost – arable		**46.20**
Net cost – dairy		**49**
Net cost - horticulture		**161.70**
Transaction costs		+20%
Payment rate (100% of net costs) – arable		**46.20**
Payment rate (100% of net costs) - dairy		**49**
Payment rate (100% of net costs) - horticulture		**161.70**

Scheme	**Nature management fields (taking land out of production)**
Sub scheme	***Nature management fields: long-term grassland***
Summary of the required management	• Specified seed mixture (combination of grass seeds, maximum 20% legumes, bioenergy reed (*Phalaris arundinacea*) is accepted); • No fertiliser application except at establishment; • Mechanical weed control; • Sward may be used as fodder;

	• Cutting regime (once every 3 years for fields that have been in place for longer than 2 years). *Requirements: Must apply to a minimum 5% and maximum 15% of area. Must be at least 0.5 ha.* *Existing old grasslands can be subscribed as this fallow type unless it has over 20% of legumes in the sward.*	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Income foregone due to loss of profit from cereal, corrected for profit from hay	38.8	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**38.8**
Additional costs		
Cost of establishment (incl. seed)	30.8	
Cost of potential maangement (mowing and biomass removal)	32.4	
Total additional costs		63.2
Net cost		**101.9**
Transaction costs		+20%
Payment rate (100% of net costs)		**170**[93]
Sub scheme	***Nature management fields: biodiversity field (game, landscape and meadow)***	
Summary of the required management	• Specified seed mixture (containing either low-competitive grasses and meadow plants, or game, or amenity species *e.g.,* sunflower (*Helianthus annuus*), phacelia (*Phacelia*) spp.*,* common vetch (*Vicia sativa*), and garden marigold (*Calendula officinalis*)); • Mechanical weed control; • Sward cannot be used as fodder; • For the meadow, must apply to a field for at least 2 years; • Game and landscape options should be reseeded every year.	

[93] The €170/ha consists of two elements: 1) payment for the basic entry-level scheme which is €93/ha on crop farms and €106/ha on livestock farms; plus 2) payment for nature management fields (calculation shown here) of €77ha or €63 /ha for crop and livestock farms respectively.

	Requirements: Must apply to a minimum 5% and maximum 15% of area. Must be at least 0.5 ha.	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Income foregone due to loss of profit from cereal	116.6	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**116.6**
Additional costs		
Cost of establishment	65.1	
Cost of seed	233	
Total additional costs		298.1
Net cost		**414.70**
Transaction costs		20%
Payment rate (approx.. 50 % of net cost)		**300**[94]

Scheme	**Fertilisation of arable crops**	
Summary of the required management	The management is the same for different farming systems but the payments vary: • Limits to fertiliser application; • Soil samples every 5 years; • Record keeping.	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Income foregone for lowered level of P and decrease in biomass	-	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**-**
Additional costs		
Additional costs for storage space	-	

[94] The €300/ha consists of two elements: 1) payment for the basic entry-level which is €93/ha on crop farms and €106/ha on livestock farms; plus 2) payment for biodiversity fields (calculation shown here) of €207ha or €194 /ha for crop and livestock farms respectively.

Additional costs for alternative fertilisers	-	
Total additional costs - arable		-
Total additional costs – dairy		-
Total additional costs – horticulture		Nil
Net cost – arable		**12.50**
Net cost – dairy		**23.70**
Net cost - horticulture		**Nil**
Transaction costs		+20%
Payment rate (100% of net costs) – arable		**12.50**
Payment rate (100% of net costs) - dairy		**23.70**
Payment rate (100% of net costs) - horticulture		**Nil**

Scheme	**Headlands and filter strips**	
Summary of the required management	The management is the same for different farming systems but the payments vary: • Riparian buffer strips (minimum 1m and maximum 3m wide alongside ditches and other water bodies, covered with perennial herbaceous plants). These buffer strips may be wider than 3m if for reasons of water conservation but this must not exceed 10m. • Non-riparian buffer strips may be established for biological diversity reasons (must be 3m wide on average).	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Income foregone for lost cultivated area	-	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**-**
Additional costs		
Cost of establishment	-	
Cost of management	-	
Total additional costs - all farming systems except horticulture		-
Total additional costs -		-

horticulture		
Net cost – all farming systems except horticulture		**12.50**
Net cost - horticulture		**185.40**
Transaction costs		+20%
Payment rate (100% of net costs) – all farming systems except horticulture		**4.20**
Payment rate (100% of net costs) - horticulture		**185.40**

Scheme	**Maintenance of biodiversity and landscape**	
Summary of the required management	The management is the same for different farming systems but the payments vary: • Landscape feature management. • No plant protection products permitted on headlands of roads on arable land.	
Elements of payment calculation	**EUR/ha**	
Income foregone		
N/A	Nil	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**Nil**
Additional costs		
Cost of management	-	
Total additional costs - all farming systems except horticulture		-
Total additional costs - horticulture		-
Net cost – all farming systems except horticulture		**30.60**
Net cost - horticulture		**103.30**
Transaction costs		+20%
Payment rate (100% of net costs) – all farming systems except horticulture		**30.60**
Payment rate (100% of net costs) - horticulture		**103.30**

Table A6.4: Payment calculation for France

Scheme	**Extensive grazing systems (PHAE)**	
Summary of the required management	• Area must be under contract for 5 years; • No ploughing of permanent grassland permitted; • Temporary grassland may be moved once in 5 years; • Limits to fertiliser application (total nitrogen fertilization limited to 125 unit/ha/year, with at most 60 unit/ha/year in mineral; total phosphate fertilization limit is 90 unit/ha/year, with at most 60 unit/ha/year in mineral; total potassium fertilization limit is 160 unit/ha/year, with at most 60 unit/ha/year in mineral. • Record keeping for inputs; • Prohibition of chemical weed kill; • Mechanical or manual shrub control; • Biodiversity elements on at least 20% of the contracted area • Levelling and new drainage is prohibited.	
Elements of payment calculation	**EUR/ha**	
Income foregone		
Income foregone due to yield decrease from unploughed pasture minus savings on grass seed	8.37	
Income foregone due to yield decrease from reduced fertiliser minus savings on fertiliser	71.96	
Total income foregone		**80.33**
Additional costs		
N/A	Nil	
Total additional costs		Nil
Net cost		**80.33**
Transaction costs		Nil
Payment rate (95% of net cost)		**76**

Scheme	**Crop rotations and crop diversification (MAER)**
Summary of the required management	• Crop rotation: minimum 3 crops per rotation for at least 5 years; a field cannot be planted with the same crop 2 years in a row; main crop must be less than 45% of UAA under contract; the three main crops together cannot total more than 90% of UAA under contract.

Elements of payment calculation	**EUR/ha**	
Income foregone		
Gross margin of normal crop rotation minus gross margin of agri-environment crop rotation	474.71 - 453.16	21.55
Savings		
Saving on cost of phytosanitary treatment	13.04	
Total savings		13.04
Total income foregone		**8.51**
Additional costs		
Additional man power	3.31	
Additional cost of plot fragmentation	19.50	
Total additional costs		22.81
Net cost		**31.32**
Transaction costs		Nil
Payment rate (100% of net costs)		**32**

Table A6.5: Payment calculation for Poland

Scheme	**Sustainable agriculture**	
Summary of the required management	• Limits to fertiliser application in keeping with a management plan based on soil samples; • Crop rotation (minimum 3 crops); • Must cut/graze permanent grassland; • Prohibited use of sewage sludge; • Maintain landscape features.	
Elements of payment calculation	**PLN/ha**	
Income foregone		
Income lost due extensive production	-	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**-**
Additional costs		
Additional cost of soil samples	-	
Additional cost of preparing nitrate balance	-	
Total additional costs		-
Net cost		**440**
Transaction costs		Nil
Payment rate (82% of net costs)[95]		**360 (92.20 EUR)**

Scheme	**Extensive meadows and pastures**
Summary of the required management	Cutting: • Cutting regime: within fixed dates (1 June – 30 September); maximum 2 cuts/year; must leave a rotational 5-10% of the plot uncut; cutting height must be between 5 – 15 cm; must cut in circles from the centre outwards ; removal of cut biomass (within two weeks of being cut). • No fertiliser or plant protection products permitted (exceptions may occur); no sewage sludge permitted; limits to lime applications.

[95] The agri-environment payment is granted at the rate of: 100% of the basic rate for the area of 1 ha to 100 ha; 50% of the basic rate for the area of 100.01 ha to 200 ha; and 10% of the basic rate for the area exceeding 200 ha.

	• Improved farming systems (does not apply to day-to-day maintenance or to increasing water levels). • No ploughing permitted. • No rolling permitted. • No sod seeding permitted. • No levelling allowed between 1 April and 1 September. Grazing: • Grazing regime: maximum livestock density by land; restricted grazing dates (from 1 May till 15 October); cutting is permitted in August and September; in flooded areas must wait two weeks after water recedes before grazing. • No fertiliser or plant protection products permitted (exceptions may occur); no sewage sludge permitted; limits to lime applications. • Improved farming systems (does not apply to day-to-day maintenance or to increasing water levels). • No ploughing permitted. • No rolling permitted. • No sod seeding permitted. • No levelling allowed between 1 April and 1 September.	
Elements of payment calculation	**PLN/ha**	
Income foregone		
Income foregone on account of extensive utilisation of a given habitat	-	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**-**
Additional costs		
Removal or stacking the cut biomass	-	
Total additional costs		-
Net cost		**596**
Transaction costs		Nil
Payment rate (84% of net		**500 (128.1 EUR)**

costs)[96]		

Scheme	**Undersowing**	
Summary of the required management	• Over winter cover – location must alternate across holding within 5 year contract; • Removal of straw after harvest; • Restricted management dates (cultivation not to restart before 1 March); • Plough in undersown catch crop (except non tillage cultivation systems); • No sewage or sewage sludge permitted	
Elements of payment calculation	**PLN/ha**	
Income foregone		
Income foregone due to lower standard gross margin in the main yield	-	
Savings		
Improved soil quality in the following year	-	
Reduced nitrogen	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Additional cost of seeds	-	
Additional cost of sowing more seeds	-	
Total additional costs		-
Net cost		**456**
Transaction costs		Nil
Payment rate (72% of net costs)		**330 (84.50 EUR)**

Scheme	**Winter catch cropping**
Summary of the required management	• Over winter cover must be sown by the end of September; • No synthetic fertilisers permitted; • No sewage or sewage sludge permitted; • Plough in undersown catch crop (except non tillage cultivation systems);

[96] The agri-environment payment is granted at the rate of: 100% of basic rate for the area between 1 and 10 ha; 75% of basic rate for the area between 10.01 and 50 ha; 50% of basic rate for the area between 50.01 and 100 ha; 10% of basic rate for the area above 100 ha. This does not apply to areas under Natura 2000.

	• Restricted management dates (cultivation only renewed after 1 March).	
Elements of payment calculation	**PLN/ha**	
Income foregone		
Gross margin from subsequent harvest lower by 30%	-	
Savings		
Reduced nitrogen use	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Additional cost of seeds	-	
Additional cost of planting/sowing seeds	-	
Total additional costs		-
Net cost		**751**
Transaction costs		Nil
Payment rate (56% of net costs)		**420 (107.6 EUR)**

Scheme	**Stubble catch cropping**	
Summary of the required management	• Catch crop plants must be sown by the end of September; • No synthetic fertilisers permitted; • No sewage or sewage sludge permitted; • Plough in undersown after crop (except non tillage cultivation systems); • Restricted management dates (cultivation only renewed after 1 March).	
Elements of payment calculation	**PLN/ha**	
Income foregone		
Lower gross margin from subsequent harvest	-	
Savings		
Reduced nitrogen use	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Additional cost of seeds	-	
Additional cost of planting/sowing seeds	-	
Total additional costs		-

Net cost		**695**
Transaction costs		Nil
Payment rate (58% of net costs)		**400 (102.5 EUR)**

Scheme	**Buffer strips**	
Sub scheme	***2 m riparian buffer strip***	
Summary of the required management	• Maintain 2 m buffer strip; • Cut once a year or once every two years before 30 September, preserving existing trees and bushes; • No fertiliser permitted; • No plant protection products permitted; • Remove unwanted vegetation within two weeks of cut.	
Elements of payment calculation	**PLN/ha**	
Income foregone		
Loss of standard gross margin	-	
Savings		
Value of hay for bedding	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Cutting	-	
Removal of cut biomass	-	
Lost area payment	-	
Lost LFA payment	-	
Total additional costs		-
Net cost		**2,243**
Transaction costs		Nil
Payment rate (100% of net costs)		**2,243 (574.6 EUR/ha)**
Sub scheme	***5 m riparian buffer strip***	
Summary of the required management	• Maintain 5 m buffer strip; • Cut once a year or once every two years before 30 September, preserving existing trees and bushes; • No fertiliser permitted; • No plant protection products permitted; • Remove unwanted vegetation within two weeks of cut.	
Elements of payment calculation	**PLN/ha**	
Income foregone		

Loss of standard gross margin	-	
Savings		
Value of hay for bedding	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Cutting	-	
Removal of cut biomass	-	
Lost area payment	-	
Lost LFA payment	-	
Total additional costs		-
Net cost		**2,243**
Transaction costs		Nil
Payment rate (100% of net costs)		**2,243 (574.6 EUR/ha)**
Sub scheme	***2 m field margin***	
Summary of the required management	• Maintain 2 m field margin; • Cut once a year or once every two years before 30 September, preserving existing trees and bushes and nurture hedges; • No fertiliser permitted; • No plant protection products permitted.	
Elements of payment calculation	**PLN/ha**	
Income foregone		
Loss of standard gross margin	-	
Savings		
Value of hay for bedding	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Cutting	-	
Lost area payment	-	
Lost LFA payment	-	
Total additional costs		-
Net cost		**2,033**
Transaction costs		Nil
Payment rate (100% of net costs)		**2,033 (520.8 EUR/ha)**
Sub scheme	***5 m field margin***	
Summary of the required management	• Maintain 5 m field margin; • Cut once a year or once every two years before 30 September, preserving existing trees and bushes and nurture hedges; • No fertiliser permitted;	

	• No plant protection products permitted.	
Elements of payment calculation	**PLN/ha**	
Income foregone		
Loss of standard gross margin	-	
Savings		
Value of hay for bedding	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Cutting	-	
Lost area payment	-	
Lost LFA payment	-	
Total additional costs		-
Net cost		**2,033**
Transaction costs		Nil
Payment rate (100% of net costs)		**2,033 (520.8 EUR/ha)**

Table A6.6: Payment calculation for England (UK)[97]

Scheme	**Entry level stewardship**	
Sub scheme	***Hedgerow management (EB1 and EB2)***	
Summary of the required management	• Minimum height of 1.5 m; • Maximum 1 cut of hedgerow every 2 years; • No cutting March - August (extension of GAEC). EB1 specifies management on one side and EB2 specifies hedgerow management on both sides.	
Elements of payment calculation	**£/100m of hedge**	
Income foregone		
N/A	Nil	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**Nil**
Additional costs		
Labour and machinery	22	
Total additional costs		22
Net cost		**22**
Transaction costs		Nil
Payment rate (100% of net costs)		**22 (€28)**
Sub scheme	***Enhanced hedgerow management (EB3)***	
Summary of the required management	• Minimum height of 2 m; • Maximum 1 cut of hedgerow every 3 years.	
Elements of payment calculation	**£/100m**	
Income foregone		
N/A	Nil	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**Nil**
Additional costs		
Labour and machinery	44	
Total additional costs		44
Net cost		**44**

[97] In the UK examples a conversion rate of £1 to €1.25 has been used.

Transaction costs		Nil
Payment rate (92% of net costs)		**42 (€53)**
Sub scheme	***2 m and 4 m buffer strips (EE1 and EE2)***	
Summary of the required management	• Must be in addition to GAEC (ie the measured width must start at 2 m); • No fertiliser or manure permitted; • Herbicide application only permitted by spot application; • Regular cutting may be undertaken in the first 12-24 months to control annual weeds and encourage grasses to tiller, but after this period cutting should be carried out only to control woody growth, and no more than once in every two years; • No regular vehicular access.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	398	
Savings		
Costs saved	82	
Total savings		82
Total income foregone		**316**
Additional costs		
Extra costs	74	
Total additional costs		
Net cost		**390**
Transaction costs		Nil
Payment rate (77% of net costs)		**300 (€375)**
Sub scheme	***6 m buffer strips (EE6 and EE9)***	
Summary of the required management	• Must be in addition to GAEC (ie the measured width must start at 2 m); • No fertiliser or manure permitted; • Herbicide application only permitted by spot application; • Regular cutting may be undertaken in the first 12-24 months to control annual weeds and encourage grasses to tiller, but after this period, cutting should be carried out only to control woody growth, and no more than once in every two years; • No regular vehicular access; • Must cut the three metres next to the crop annually after mid-July;	

	• If the margin has a mixture of fine-leaved grasses and flowers, annual cutting in August or September is recommended, with an additional cut in March or April if the flowering species are suppressed; • Removal of cuttings is suggested, but not required.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	398	
Savings		
Costs saved	82	
Total savings		82
Total income foregone		**316**
Additional costs		
Extra costs	74	
Total additional costs		
Net cost		**390**
Transaction costs		Nil
Payment rate (103% of net costs)		**400 (€500)**
Sub scheme	***Permanent grassland with low inputs outside Severely Disadvantaged Area of LFA and Moorland Line (EK2)***	
Summary of the required management	• Management by cutting or grazing; • Cutting, harrowing and rolling are prohibited between 1 April and 31 May; • A range of sward heights should be maintained through the season, with at least 20 per cent less than seven centimetres and 20 per cent more than seven centimetres (except when shut up for hay or silage); • Topping and herbicide use (by spot application of weed-wiper) are allowed only for control of injurious weeds and invasive non-native species, or to control scrub invasion; • Feeders must be moved as often as required to prevent poaching; • Nitrogen use is restricted to 50 kilograms per hectare as inorganic fertiliser, or 100 kilograms total, including organic manures; • Liming is allowed.	
Elements of payment calculation	**£/ha**	
Income foregone		

Income lost	368	
Savings		
Extra income	228	
Costs saved	132	
Total savings		360
Total income foregone		**8**
Additional costs		
Extra costs	80	
Total additional costs		80
Net cost		**88**
Transaction costs		Nil
Payment rate (97% of net costs)		**85 (€106)**
Sub scheme	***Permanent grassland with very low inputs outside Severely Disadvantaged Area of LFA and Moorland Line (EK3)***	
Summary of the required management	• Management by cutting or grazing; • Cutting, harrowing and rolling are prohibited between 1 April and 30 June; • A range of sward heights should be maintained through the season, with at least 20 per cent less than seven centimetres and 20 per cent more than seven centimetres (except when shut up for hay or silage); • Topping and herbicide use (by spot application of weed-wiper) are only allowed for control of injurious weeds and invasive non-native species, or to control scrub invasion; • Feeders must be moved as often as required to prevent poaching; • No fertilisers of manures are allowed except for farm manure up to 12.5 tonnes/ha where the grass is regularly cut; • Liming is allowed.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	368	
Savings		
Extra income	126	
Costs saved	132	
Total savings		258
Total income foregone		**110**
Additional costs		

Extra costs	40	
Total additional costs		40
Net cost		**150**
Transaction costs		Nil
Payment rate (100% of net costs)		**150 (€188)**
Sub scheme	***Stubbles/post-harvest management (EF6)***	
Summary of the required management	• Straw must be baled, or chopped and spread after harvest; • No pesticide, fertilisers, manures (including manure heaps) or lime may be applied; • The stubble must not be topped or grazed; • No pre-harvest desiccants or post-harvest herbicides must be applied, and • The stubble must be retained until 14 February, after which it can be returned to the farm rotation.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	509	
Savings		
Extra income	383	
Costs saved	14	
Total savings		397
Total income foregone		**112**
Additional costs		
Extra costs	16	
Total additional costs		16
Net cost		**128**
Transaction costs		Nil
Payment rate (94% of net costs)		**120 (€150)**
Sub scheme	***Management of maize crops to reduce soil erosion (EJ2)***	
Summary of the required management	• Restricted management dates (harvest by 1 October and remove any compaction); • Within two weeks of harvest plough/cultivate/autumn sown crop/undersow with a grass or grass-clover mix; • Limits to slurry application.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	15	
Savings		

N/A	Nil	
Total savings	Nil	
Total income foregone		**15**
Additional costs		
N/A	Nil	
Total additional costs		Nil
Net cost		**15**
Transaction costs		Nil
Payment rate (120% of net costs)		**18 (€23)**
Sub scheme	***Enhanced management of maize crops to reduce soil erosion (EJ10)***	
Summary of the required management	• Restricted management dates (harvest by 1 October and remove any compaction); • Establish autumn sown cover crop such as rye, barley, mustard, which must remain for a minimum six weeks before spring crop is established; • Limits to slurry application.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	94	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**94**
Additional costs		
N/A	Nil	
Total additional costs		Nil
Net cost		**94**
Transaction costs		Nil
Payment rate (100% of net costs)		**94**
Sub scheme	***Infield grass areas to prevent erosion and run-off (EJ5)***	
Summary of the required management	• Establish dense grass area on areas vulnerable to soil erosion (light soils, steep slopes etc.); • Similar management to buffer strips except that after the first 12-24 months, the area is cut annually after mid-July.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	454	
Savings		

N/A	Nil	
Total savings		Nil
Total income foregone		**454**
Additional costs		
N/A	Nil	
Total additional costs		Nil
Net cost		**454**
Transaction costs		Nil
Payment rate (77% of net costs)		**350 (€438)**
Sub scheme	***Stone walls (EB11)***	
Summary of the required management		
Elements of payment calculation	**£/100m**	
Income foregone		
N/A	Nil	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**Nil**
Additional costs		
Labour and cost of wall	£22/100m	
Total additional costs		£22/100m
Net cost		**£22/100m**
Transaction costs		Nil
Payment rate (68% of net costs)		**15 (€19)/100m**
Sub scheme	***Protection of in-field trees on arable (EC1)***	
Summary of the required management	Management applies to 2 m radius around tree: • No cultivation; • No supplementary animal feed; • No storage of materials or machinery; no weed control (except for spot application); • No lime; • No fertiliser or manure applications; • Fallen branches must be left in situ.	
Elements of payment calculation	**£/tree**	
Income foregone		
Income lost	398	
Savings		
Costs saved	82	
Total savings		82
Total income foregone		**316**

Additional costs		
Extra costs	67	
Total additional costs		67
Net cost		**383/ha (12.03/tree)**
Transaction costs		Nil
Payment rate (100% of net costs)		**12 (€15)/tree**
Sub scheme	***Protection of in-field trees on grassland (EC2)***	
Summary of the required management	Management applies to 2 m radius around tree: • No cultivation; • No supplementary animal feed; • No storage of materials or machinery; No weed control (except for spot application); • No lime; • No fertiliser or manure applications; • Fallen branches must be left in situ.	
Elements of payment calculation	**£/tree**	
Income foregone		
Income lost	679	
Savings		
Extra income	184	
Costs saved	146	
Total savings		330
Total income foregone		**349**
Additional costs		
Extra costs	23	
Total additional costs		23
Net cost		**372 (£16.38/tree)**
Transaction costs		Nil
Payment rate (100% of net costs)		**16 (€20)/tree**
Sub scheme	***Maintenance of woodland fences (EC3)***	
Summary of the required management	• Maintain fences in stock-proof condition to ensure exclusion of livestock from woodland.	
Elements of payment calculation	**£/100m**	
Income foregone		
N/A	Nil	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**Nil**
Additional costs		
Extra costs	£4/100m	

Total additional costs		4/100m
Net cost		**4/100m**
Transaction costs		Nil
Payment rate (100% of net costs)		**4 (€5)/100m**
Sub scheme	***Management of woodland edges (EC4)***	
Summary of the required management	• Maintain fences in stock-proof condition to ensure exclusion of livestock from woodland; • 6 m buffer where cultivation is forbidden on woodland edge; • Cover of scrub growth must not exceed 50 per cent of the area; • Cutting can be carried out to maintain a scrub/grass mosaic and for control of injurious weeds or invasive non-native species (herbicides can also be used by spot-treatment or weed wiper); • No more than a third of the shrubby growth can be cut per year, and not between 1 March and 31 August; • Supplementary feeders, water troughs or mineral licks should not be positioned in such a way as to cause poaching at the woodland edge.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	467	
Savings		
Costs saved	82	
Total savings		82
Total income foregone		**385**
Additional costs		
N/A	Nil	
Total additional costs		Nil
Net cost		**385**
Transaction costs		Nil
Payment rate (99% of net costs)		**380 (€475)/ha**
Sub scheme	***Unfertilised cereal headlands (EF9)***	
Summary of the required management	• 6m-24m wide headland along edge of arable crop • No fertilisers or manure, limited pesticides and herbicides.	
Elements of payment calculation	**£/ha**	
Income foregone		

Income lost	590	
Savings		
Extra income	492	
Costs saved	79	
Total savings		571
Total income foregone		**19**
Additional costs		
Extra costs	89	
Total additional costs		89
Net cost		**108**
Transaction costs		Nil
Payment rate (93% of net costs)		**100 (€125)/ha**
Sub scheme	***Unharvested cereal headlands (EF10)***	
Summary of the required management	• Sow 3m-6m cereal headland and leave unharvested until following spring • No fertilisers or manure, limited pesticides and herbicides.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	590	
Savings		
Extra income	162	
Costs saved	202	
Total savings		364
Total income foregone		**226**
Additional costs		
Extra costs	104	
Total additional costs		104
Net cost		**330**
Transaction costs		Nil
Payment rate (100% of net costs)		**330 (€413)/ha**
Sub scheme	***Mixed stocking (EK5)***	
Summary of the required management	• Minimum 30% of livestock must be cattle and minimum 15% sheep over two year period.	
Elements of payment calculation	**£/ha**	
Income foregone		
N/A	Nil	
Savings		
N/A	Nil	
Total savings		Nil

Total income foregone		**Nil**
Additional costs		
Labour	9	
Total additional costs		9
Net cost		**9**
Transaction costs		Nil
Payment rate (89% of net costs)		**8 (€10)/ha**

Table A6.7: Payment calculation for Scotland (UK)

Scheme	**Land Managers Option**	
Sub scheme	***Hedgerow management (Option 13)***	
Summary of the required management	• Minimum height of 1.5 m; • Minimum 2 m wide at the base; • Must be managed for at least two years to form an 'A' shape; • Restricted management dates – cutting only permitted between 1 December and 1 March; • Cutting only allowed once every two years and thereafter once every three years; • Gaps must be filled by planting; laying and allowing the development of hedgerow trees are encouraged.	
Elements of payment calculation	**£/m**	
Income foregone		
N/A	Nil	
Savings		
N/A	Nil	
Total savings		Nil
Total income foregone		**Nil**
Additional costs		
Extra costs	0.10	
Total additional costs		0.10
Net cost		**0.10**
Transaction costs		Nil
Payment rate (100% of net costs)		**0.10 (€0.13)/m of hedgerow**
Sub scheme	***Buffer strips (Option 14)***	
Summary of the required management	• Management of grass margins and beetle banks - location of grass strips is determined by a diffuse pollution audit; • Between 1.5 and 6 m in width (minimum 30 m width of arable cropping next to a strip if the	

	whole field is not dedicated to arable); • Margin may be grazed or topped after harvest, maintaining a minimum average height of 100 millimetres; • No fertiliser, manure, slurry or pesticides can be applied, with the exception of spot treatment; • Scrub control is prohibited without written permission.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	-	
Savings		
Costs saved	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Extra costs	-	
Total additional costs		
Net cost		**473.76**
Transaction costs		Nil
Payment rate (100% of net costs)		**473.76 (€592.2)/ha**
Sub scheme	***Stubbles/post harvest management (Option 17)***	
Summary of the required management	• Retention of stubbles following cereal, protein or oilseed crops (but not arable silage) until 1 March of the following year; • Prohibition on the use of pre-harvest desiccants and post-harvest herbicides; • Controlled grazing permitted post harvest.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	-	
Savings		
Extra income	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Extra costs	-	
Total additional costs		-
Net cost		**96**
Transaction costs		Nil
Payment rate (100% of net costs)		**96 (€120)/ha**
Sub scheme	***Stone walls (Option 13)***	

Summary of the required management	• Repair of minor damage to stone walls ('drystane dykes' in Scotland).	
Elements of payment calculation	**£/1m**	
Income foregone		
Income lost	-	
Savings		
Extra income	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Extra costs	-	
Total additional costs		-
Net cost		**0.10**
Transaction costs		Nil
Payment rate (100% of net costs)		**0.10 (€13)/m of stone wall**
Sub scheme	***Conservation headlands***	
Summary of the required management	• No pesticides may be applied without the agreement of Scottish ministers; • Retain stubble after harvest until of February (additional £21 (€26) to standard payment).	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	-	
Savings		
Extra income	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Extra costs	-	
Total additional costs		-
Net cost		**70**
Transaction costs		Nil
Payment rate (100% of net costs)		**70 (€88)/ha (can be higher if additional management action is adopted – see above)**
Sub scheme	***Premium conservation headlands***	
Summary of the required management	• No pesticides may be applied may be applied at all without the agreement of Scottish ministers; • No fertiliser application.	

Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	-	
Savings		
Extra income	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Extra costs	-	
Total additional costs		-
Net cost		**135.14**
Transaction costs		Nil
Payment rate (100% of net costs)		**135.14 (€170)/ha**
Sub scheme	***Summer cattle grazing (Option 11)***	
Summary of the required management	• Requires cattle to be turned out onto unenclosed or hill land on or before 1 June, and to be kept there for three months; • Cattle must be at least six months old; • Must be grazed at a minimum stocking level of one animal per 25 hectares.	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	-	
Savings		
Cost savings	-	
Total savings		-
Total income foregone		**-**
Additional costs		
Extra costs	-	
Total additional costs		-
Net cost		**393**
Transaction costs		Nil
Payment rate (100% of net costs)		**393 (€491.25)/ha**
Sub scheme	***Moorland grazing (Option 12)***	
Summary of the required management	• Prepare a moorland grazing plan and carry it out	
Elements of payment calculation	**£/ha**	
Income foregone		
Income lost	-	
Savings		
Cost savings	-	

Total savings		-
Total income foregone		**-**
Additional costs		
Extra costs	-	
Total additional costs		-
Net cost		**149**
Transaction costs		Nil
Payment rate (100% of net costs)		**149 (€186)/ha**

ANNEX 7 - NGO-FUNDED PILOT AGRI-ENVIRONMENT SCHEMES IN BULGARIA

In Bulgaria an alternative way of piloting agri-environment actions is through projects implemented by environmental NGOs. The pilot schemes aim to test EAFRD measures that are not supported by the Bulgarian Rural Development Programme (RDP), but could be included if proven effective. Usually this is done with the support of the Ministry of Agriculture and the paying agency (with letters of support, participation in the steering committee of the project and in the evaluations commissioned). Such grant schemes are implemented by the Bulgarian Society for the Protection of Birds (BSPB) under the GEF/UNDP funded project *Conservation of globally important biodiversity in high nature value semi-natural grasslands through support for the traditional local economy*. The scheme featured here is implemented in three pilot regions which are IBAs – 'Ponor', 'Besapari hills' and 'Western Balkan'. Financial support is offered to farmers under the following measures:

- Natura 2000 compensatory payments;
- Agri-environment payments;
- Non-productive investments;
- Investment activities contributing to conservation of the traditional economies in protected sites.

The activities are similar to the agri-environment action HNV1 (restoration and maintenance of under-grazed HNV grasslands) and are summarised in the table below. The payment rates were calculated for this regional scheme in 2009 (two years after the payments for the national agri-environment measure were calculated) and are substantially higher (more than double) for more or less the same activities.

Table A7.1: NGO-funded pilot agri-environment schemes in Bulgaria

Management requirements	**Management of grasslands through grazing** – habitats with codes 6210, 6220, 6240, 6250, 62A0, 62C0**:** • Direct payment for maintenance of stocking density from 0.3 up to 0.6 LU/ha. The development and observance of a grazing plan is obligatory. • Additional payments (up to 10% of the direct payment) for pasturing of mixed flocks, including goats, at stocking density from 0.3 to 0.6 LU/ha.
Payment calculations	Payments are based on: • Income forgone from lower livestock density/ ha • Additional costs from activity that go beyond traditional farming practices • Compensation to farmers for not applying for Single Area Payment Scheme
Reference level	No baseline requirements are specified. In the payment calculations it is assumed that the traditional livestock density per ha is 1.8LU/ha
Management requirements	**Grassland management** – habitats with codes 6510, 6520, **through mowing:** Mowing must be done manually or by slow grass cutting machines; • Two mowings per year are allowed;

	• The first mowing should be done after ripening of grass (up to 500 m altitude after 15 June, between 500 m to 1000 m altitude after 30 June and above 1000 m altitude after 15 July) on 60% of the area; • The areas left unmown should be used on rotational principle; • Mowing height should be at least 8 cm. Strips of land wide up to 1 m and covered with elder and nettle should be left where the grassland abuts watercourses and/or bushes and trees; • Mowing should be done from the centre to the periphery; • Restrictions for manure – less than 1-1.5 tonnes per year. The decomposition of the manure should be 3-4 months.
Payment calculations	Payments are based on: • Income forgone from losses of nutritive capacity of hay 50%; • Additional costs from activity that go beyond the traditional farming practices, including drying and collection of hay; manual mowing; bailer; • Compensation to farmers for not applying for Single Area Payment Scheme.
Reference level	No baseline requirements are specified. In the payment calculations it is assumed that according to the GAEC requirement 4.2 the area that is left unmown is 20% of the total area of the Natura 2000 site.
Management requirements	**Grassland management** – habitats with codes 6510, 6520, **through grazing:** • Direct payment for maintenance of stocking density from 0.8 LU/ha with development and observance of a grazing plan; • Additional payments (up to 10% of the direct payment) for pasturing of mixed flocks, including goats, with maintenance of density of the livestock from 0.8 LU/ha.
Payment calculations	Payments are based on: • Income forgone from lower livestock density per ha; • Additional costs from activity that surpasses the traditional farming practices; • Compensation to farmers for not applying for single payment scheme.
Reference level	No baseline requirements are specified. In the payment calculations it is assumed that the traditional livestock density/ha is 1.8LU/ha

ANNEX 8 - REVISIONS TO THE ENTRY-LEVEL AGRI-ENVIRONMENT SCHEME IN BULGARIA DURING THE COURSE OF THE 2007-13 PROGRAMME

The table below illustrates the substantial modifications made to the Bulgarian HNV grasslands schemes since 2007. Initially two separate entry-level schemes were devised to address quite different problems – under-grazing and over-grazing – which require different management. These schemes were both modified in 2009 to deal with implementation problems but more recently they have had to be combined because data availability makes it impossible to distinguish the two types of grassland.

Table A8.1: Revisions to the entry-level agri-environment scheme in Bulgaria during the course of the 2007-13 programme

Version of RDP	Changes introduced	Justification
RDP officially approved (December 2007)	**4th modification (2009)**	
HNV 1. Maintenance and restoration of undergrazed HNV grasslands		
	New requirement introduced: *Each year farmers have to specify whether the grassland will be mowed or grazed. Requirements divided for grazing and mowing.*	This will make the management requirement more specific and will lead to better and easier controllability and verifiability.
Clearance of all unwanted vegetation	Removed	Requirement in GAEC regarded as a baseline requirement
Use of mineral fertilizers and application of pesticides is prohibited except those defined in Regulation (EEC) 2092/91	Remained the same	
No new drainage and ploughing	Remained the same	
Maintenance of minimum and maximum density of livestock depending on natural climatic and soil conditions in order to assure a good ecological state of the meadows and pastures and keep permanent grass cover. The minimum and maximum levels should be as follows: • 0.3-1.5 LSU/ha outside protected areas • for protected territory min and max livestock density has to be according to the territory's management plan (if such a plan does not exist then the density should be between 0.3-1.5 LSU/ha). • Farmer should keep the minimum and maximum stocking density in the whole grazing area within the farmers block. Respect of stocking density will take into account all grazing livestock kept on the farm	The requirement remained the same but the second bullet was removed (for protected territory min and max livestock density have to be according to the territory's management plan (if such a plan does not exist then the density should be between 0.3-1.5 LSU/ha).	Removed because it was impossible to control. GIS data exists only for National Parks and the grazing there is allowed only if the farmer has permission for grazing. **Removed after consultation with the Ministry of Environment and the Forestry Agency**
Free grazing on meadows after the last mowing (except for meadows in the forests, because they are a habitat for plant species of European conservation importance where the grazing might not be of benefit, moreover the forest meadows are used for grazing by wild fauna and human presence might disturb them).	Remained the same	

Mowing should be later than 15th of June for lowlands and between 30th of June and 15th of July for mountainous LFA as defined in Measure 211 (Annex 5).	Modified to: Mowing should be between 15th of June and 15th of July for lowlands and between 30th of June and 15th of August for mountainous LFA as defined in Measure 211 (Annex 5).	The period of mowing in the mountain HNV farmland is prolonged till 15th August, because due to the climate in these areas the grass may not be ready for mowing earlier. **This requirement was modified following a proposal of National Agricultural Advisory Service after consultations with farmers**
The mowing may be done manually or if it is with a slow grass cutting machine to be from the centre towards the periphery of the meadow and with low speed. (This will allow the ground nesting birds and other animals to escape	Remained the same	
Grazing on sandy dunes is not allowed	Removed	The requirement exist in the national legislation
HNV 2. Maintenance and restoration of overgrazed HNV grasslands		
Same as HNV1 + re-seeding with seeds of local provenance	The same changes as in HNV 1 scheme (above)	
Modified in 2009 as described above	**6th notification (approved, December 2011)**	
HNV 1. Maintenance and restoration of undergrazed HNV grasslands **HNV 2. Maintenance and restoration of overgrazed HNV grasslands**		
	HNV1 and HNV2 schemes merged, with the requirement for reseeding deleted from HNV2	There is no separate layer of undergrazed and overgrazed grasslands in LPIS (Land Parcel Identification System). The farmers decided whether their grasslands were over or undergrazed. Combining the two Schemes facilitates the control, simplifies the implementation of the activities of farmers and does not compromise the achievement of the objectives of the measure. In this way the risk of incorrect identification of the type of grassland by the farmer in the application and the acceptance of the requirements for management will be avoided. **This modification was proposed after discussion with the research institutes and NGOs to find out if a definition of "overgrazed" or "undergrazed" grassland could be introduced. Such a definition was not found and thus the proposal was made**

ANNEX 9 - EVIDENCE BASE FOR THE ENTRY LEVEL STEWARDSHIP SCHEME IN ENGLAND

Evidence used in developing the scheme

The processes leading up to the creation of Entry Level Stewardship (ELS) in England have been described by Radley *et al* (2005) and Grice *et al* (2007), and show that evidence was drawn from a wide range of sources. These included:

- a review of data from monitoring and research on existing agri-environment schemes (Ecoscope Applied Ecologists, 2003);
- an economic evaluation (Centre for Economics Research and CJC Consulting, 2002);
- three public consultations at different stages of scheme development; and
- a pilot study in four areas, representing different farming types (arable and horticulture, lowland livestock, mixed lowland and upland), which was evaluated by the Central Science Laboratory[98] (Boatman *et al*, 2004). Because of the limited time available for the evaluation, outcomes could not be measured directly, but a modelling exercise was undertaken to predict the most likely outcomes on the basis of expert opinion.

Evidence base for the management prescriptions

The level of evidence available on which to base the management prescriptions varied. In some cases, there was a substantial research base, showing benefits from specific types of management. In other cases, prescriptions were largely based on the knowledge and experience of Defra and Government environmental agencies, in consultation with conservation NGOs.

A particularly strong evidence base was available for entry-level options on arable land. Much of this research was stimulated by concern over the decline of common farmland bird species, given impetus when Government adopted in 1999 a 'wild bird population' indicator of sustainable development, which monitored populations of nineteen widespread farmland bird species; a subsequent Government target to reverse the decline in this Farmland Bird Index by 2020 reinforced this concern (Grice *et al*, 2007). Examples of this evidence base include research showing: the importance of stubbles in providing food for overwintering granivorous bird species (Evans, 1997; Vickery et al, 2002; Gillings *et al*, 2005), wild bird seed mixtures to enhance seed food provision for overwintering birds (Boatman *et al*, 2002; Henderson *et al*, 2004), 'conservation headlands' developed for grey partridges (Sotherton, 1991) and 'skylark plots' for skylarks (Morris *et al*, 2004), both developed specifically as a result of research on the reasons for the decline of these iconic species.

In addition to this strong research base, the Arable Stewardship Pilot Scheme had provided experience of implementation of many of the arable options in a commercial farming context, and the evaluation provided evidence of responses by plants and invertebrates (ADAS, 2001), birds and brown hare (Bradbury and Allen, 2003; Bradbury *et al*, 2004; Browne and Aebischer, 2004).

Other prescriptions were also informed by research and monitoring experience from previous agri-environment schemes (for a comprehensive review of monitoring and

[98] now the Food and Environment Research Agency

evaluation of agri-environment schemes, following on from that of Ecoscope Applied Ecologists (2003), see Boatman *et al* (2008)).

Reviewing the scheme during implementation

Shortly after Environmental Stewardship was launched, an evaluation of the operation of the scheme during its first two years was commissioned by Defra from the Central Science Laboratory (CSL) (Boatman *et al*, 2007a). Key messages were:

- Most participants, a majority of non-participants and stakeholders consulted supported the scheme.
- The guidance provided was considered useful, though more guidance on option choice would be beneficial.
- The pattern of uptake was strongly skewed, with many options exhibiting very low uptake. For example, the six most popular options (of the 60 available) accounted for around 50% of all points scored, with the top 20 covering 90%, suggesting that some re-balancing might be called for.
- Farmers tended to choose options involving relatively little change to current practice, or a reduction in management (e.g. cutting hedges less frequently), although for certain options they appeared to have underestimated the amount of change needed. Indeed, the baseline environmental assessment of the ELS and OELS indicated that a considerable amount of change in management practices would be required to fulfil option prescriptions.
- Quality of features being managed was generally good or very good, though some were poor. Comparison with features outside the scheme indicated that, for many of the attributes measured, higher quality features were being selected within farms for entry into the scheme.
- Modelling of environmental benefits indicated that significant contributions will be made by ELS/OELS, but greater uptake of some less popular options could increase environmental benefits. There was also evidence of a gap between ELS and HLS strands which might mean that opportunities for improvement were being missed.

The CSL evaluation formed the main evidence base for a review of progress by Defra in 2007 (Defra and Natural England, 2008), with the following aims:

- provide assurance in relation to delivery to date (on the basis of an independent evaluation of performance);
- explore ways of securing better value for money, from the funding available; and
- take account of new policy priorities since the original launch in 2005, in particular climate change.

Stakeholders attended four workshops in July, September and November 2007 and January 2008, and in addition written consultations were also carried out on all draft recommendations. Other sources of evidence quoted included three additional studies by CSL: a study to evaluate the contribution of ES to biodiversity indicators and to water quality indicators (Boatman *et al,* 2007b); a study of the operation of ELS in upland areas (Bishop *et al*, 2007), which showed that the barriers to entry in the uplands were largely perceived but that more advice could be beneficial; and a re-evaluation of the ELS pilot areas (Bishop *et al*, 2008), which provided some useful evidence and detailed recommendations about specific options, due to the longer time these agreements had been in place (four years) compared to the national scheme. In addition, surveys by the NFU, Red Meat Industry Forum (RMIF)

and Royal Institute of Chartered Surveyors (RICS) were consulted, which provided useful evidence on farmers' views of the entry-level scheme and how they might react to change.

Overall, this review recommended around 100 changes to ELS options, including around 40 changes to detail of the options to improve the scheme and resolve minor issues, about 27 to make options more demanding, about 20 to make them more flexible, and the development and adoption of around 14 new options. Recommendations were also made for the provision of an enhanced, geographically differentiated programme provision of advice to ELS applicants, and to examine the possible inclusion of capital items in ELS. Ways of stimulating uptake of a wider range of options, such as 'split lists' and points rebalancing were recommended for consideration, along with the possibility of an enhanced ELS, with a higher points threshold.

Some examples of revisions to ELS during the period 2008-2010

Key recommendations for changes to options are listed below, along with the years in which they were implemented where applicable. In most cases, changes to options were introduced in the 2008 version of the handbook (though a few were not introduced until 2009), whereas new options were introduced in 2009 or 2010. Note that some changes appear under more than one heading and that other revisions not covered here are described in Chapter 6.

Grassland

- EK2, EK3, EL2, EL3: add more explanation of desirable sward condition, and prescriptions on sward height and topping. Consider separate options or supplements for pastures and meadows (2008).
- EK5: Mixed stocking: increase requirement to 30% cattle (2009).
- EL5: allow supplementary feeding, with restrictions, and increase parcel size limit (not implemented).

Arable

- EF9 and EF10: Remove conventional conservation headland as it does not deliver value for money. Make fertiliser-free headlands unharvested to deliver seed supply over the critical winter months between December and February (2008).
- EF2/EG2: Provide better specification of permitted crops, increase in scale allowed to reduce the risks of rapid site depletion, and use of inputs to help establishment and deliver greater wild bird seed yield (2008).
- EF4: Removal of requirement for grass, to help deliver more nectar (2008).
- EF8: Changes to establishment techniques of skylark plots to help increase uptake (2008).
- EF11: Allow a range of margin widths that can be rotated and treated with herbicide for problem weeds, to improve uptake (2008).

Field boundaries and woodlands

- EC4: Extend width of buffer for woodland edge options from 2 to 6m and tightening of eligibility criteria and suitability guidance (2008).
- EC1/2: Investigate extension of buffer zone around infield trees from under the canopy to 2m from the edge of the canopy (2009).
- New options: Introduce new options for the establishment of new hedgerow trees and protection of existing hedgerow trees (2010).

- EB1/2/8/9: Extend no-cutting period into August for basic hedgerow management options (2008).
- EB1/3/8/10: Non-eligibility of roadside hedges for two-sided hedgerow management options (2008).

Farmland birds

- EF3/4/9/10 etc.: Modify prescriptions for key arable options already in ELS (e.g. wildlife seed mixtures, skylark plots, conservation headlands) (2008).
- EB1/2/8/9: Extend no cutting period into August for basic hedgerow management options (2008).
- New options: New arable options in ELS (e.g. enhanced stubbles, summer fallows)(2010).
- New options: Subject to the results of research, new grassland options in ELS e.g. leaving silage to set seed (not yet implemented).

Resource protection

- New options: Consider/develop new options or capital items to reduce risk of soil erosion and run-off, such as temporary or permanent vegetative buffers (2010).
- New options: Develop capital items/options for protection against wind erosion (not implemented).
- EJ1: Remove EJ1 (Management of high erosion risk cultivated land) (2008).
- EG5: Remove EG5 (Management of brassica fodder crops followed by over-wintered stubbles) (2008).
- New options: Develop new options for wide grass buffer strips (both riparian and in-field), maintenance of riparian fencing and for enhanced management of maize (2009, 2010).
- Consider ways of building on the benefits that management plans options previously offered, in a way that adds value to ELS.

Recommendations for further research and evaluation

The review also made recommendations for further research and evaluation to:

- inform the optimum balance of agri-environment scheme intensity (£/ha/yr) and coverage (ha in scheme) to achieve different objectives;
- develop further understanding of landscape scale requirements;
- continue to develop the evidence base regarding the effectiveness of agri-environment spending;
- undertake further review to evaluate alternative policy and technical solutions to securing environmental benefits in the long-term;
- allow the development of the impact of ES on climate change; and
- commission further research as necessary to provide evidence on environmentally beneficial management combinations.