



THEMATIC WORKING GROUP 3
PUBLIC GOODS AND PUBLIC INTERVENTION

Final Report

December 2010



Connecting Rural Europe

The Thematic Working Group 3

The EN RD has established Thematic Working Groups (TWGs) which carry out specific analysis on the basis of the current rural development programmes focusing on specific thematic priorities. Working on the basis of a specific mandate they provide in-depth analysis of the EU Rural Development policy implementation and contribute to the understanding and diffusion of 'know-how' and experiences and improvement of its effectiveness. As of November 2010, TWGs have been established on the following topics:

- TWG1: Targeting territorial specificities and needs in Rural Development Programmes
- TWG2: Agriculture and the wider rural economy
- TWG3: Public goods and public intervention
- TWG4: Delivery mechanisms of EU Rural Development Policy

The TWG3 aims at establishing a common understanding of the significance of the role of agriculture in the provision of public goods. Particular attention was to be given to understanding the delivery mechanisms needed for encouraging the provision of respective public goods and assessing the implications for future policy developments.

The analytical work of the group was carried out on the basis of a defined work plan articulated as follows.

Under Step 1 of the work plan (concluded in October 2009) a 'Conceptual framework on Public Goods' (available on the [ENRD web site](#)) and the Step 1 report providing an overview of the main results of the Rural Development Programmes (RDP) screening exercise were produced.

The purpose of the Step 1 report was to investigate how Member States and Regions intend to deliver a range of environmental and social public goods associated with agriculture through their 2007-2013 RDP.

Step 2 of the work plan included an analytical report that builds on the evidence documented in Step 1, and provides a more detailed analysis of:

- the potential contribution of individual rural development measures to the provision of specific public goods in different regions of the EU;
- the relationship between public goods and agriculture, and aspects of undersupply of public goods;
- the role of rural development measures in delivering environmental and social public goods;
- the most used measures under the RDPs for the delivery of public goods.

Step 3 (carried out from March to mid-June 2010) involved a more comprehensive analysis of the socio-economic benefits linked to the provision of environmental public goods as well as economic and social public goods such as "rural vitality". It was undertaken by means of the collection of relevant example/case studies. The results of this activity have been incorporated into this final report.

A detailed communication plan has been outlined to be implemented starting from autumn 2010. A series of products (including a [brochure](#) on "Public goods and public intervention in agriculture") have been envisaged for a wider dissemination and discussion among EN RD stakeholders. Finally, a conclusive seminar is taking place the 10th of December 2010. The scope of the seminar is to present the outcomes of the work of the TWG3 to a larger group of stakeholders, and to clarify the notion of Public Goods to a wider audience. It will also demonstrate that the conceptual framework of public goods provides for common grounds in discussions about the CAP and Rural Development.

Executive Summary

This report provides an overview of the way in which Rural Development Programmes (RDPs) in the EU-27 Member States seek to secure the delivery of a range of public goods associated with agriculture and associated activities for the programming period 2007-2013. The purpose of the report is to provide a more detailed analysis than has been available previously of the potential contribution of RDPs as a whole, and individual rural development measures in particular, to the provision of specific public goods in different regions of the European Union. The study focuses particularly on environmental public goods as a good illustration of how policy can deliver one important category of public goods. However, the role of rural development policy in delivering rural vitality, another important public good, is also considered, albeit in less depth given the more limited availability of information on the social public goods associated with agriculture. The report also considers the extent to which the use of measures to support the provision of environmental public goods can also bring about socio-economic benefits.

While this report is concerned exclusively with rural development measures it is important to highlight that other elements of the CAP can contribute to the provision of public goods by agriculture. The report suggests that nearly all farms in Europe have the potential to deliver public goods and that measures from both pillars of the CAP have a role to play in supporting their provision, albeit to varying degrees.

Based on a desk based review of all 88 RDPs and the measures that are implemented within them and a questionnaire survey conducted with officials in 14 Member States, the report demonstrates that RDPs offer a wide range of measures to support the types of farming systems, management practices and other investments needed for the provision of public goods in a deliberate and targeted way. The rural development measures used to encourage the provision of public goods can be divided into three broad categories:

- Area-based payments incentivising land management practices that benefit soils, water quality, habitats and species, carbon management, as well as the maintenance of the landscape – for example the agri-environment, the natural handicap and the Natura 2000 measures;
- Support for capital investments that can be used, for example, to provide assistance with the costs of introducing environmentally sustainable technologies and infrastructure on farms (e.g. the farm modernisation measure), in relation to the agricultural sector more generally (e.g. the infrastructure development and the adding value to agricultural products measures), as well as to support the creation of new business opportunities, services and other activities in rural areas more generally, such as maintaining and promoting the natural heritage, supporting farm diversification, or tourism activities (e.g. the diversification, basic rural services, conservation and upgrading of rural heritage and investment in tourism measures);
- Investments in advice and training for land managers as well as capacity building for people in rural communities (e.g. advice and training measures as well as the use of the Leader approach to deliver rural development actions).

The report examines the different ways in which such rural development measures are used in different parts of Europe to deliver public goods. Amongst the measures that have the greatest reach in terms of their application in the EU-27 Member States and budget allocated to them are the agri-environment measure, the farm modernisation measure and the natural handicap measures, although other measures can be significant in terms of their impact locally. A number of these measures, most notably the agri-environment measure, have also been shown to deliver additional socio-economic benefits, whether this is providing employment opportunities as a result of the additional management needed on the farm, improving the tourist appeal of an area or adding value to local products.

However, the extent to which these measures are used to their full potential to secure the delivery of public goods in practice depends on a number of factors. These range from the selection of measures used within RDPs and the extent to which they address local needs, through the adequacy of the budgetary resources allocated to them, to the design and targeting of measures. Administrative and technical capacity within national administrations, extension services, research bodies and paying agencies, along with the provision of well considered advice and training for farmers also has a

significant effect on the degree to which RDPs deliver public goods outcomes. In addition, the existence of effective monitoring and evaluation are seen as critical in order to assess outcomes and to inform improvements in both measure and scheme design.

Based on this analysis the report concludes by summarising some useful lessons that need to be learned to improve the delivery of public goods in the next programming period. There is a need for future agricultural and rural development policies to recognise the changing nature of the socio-economic and environmental challenges facing Europe and to ensure that rural development measures are designed and targeted appropriately to meet these challenges.

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1. Introduction

This report provides an overview of the way in which Rural Development Programmes (RDPs) in the EU-27 Member States seek to secure the delivery of a range of public goods associated with agriculture for the programming period 2007-2013, as set out under Step 2 and Step 3 of the work plan of the Thematic Working Group (TWG) on 'Public Goods and Public Intervention'.

This report builds on the conceptual framework developed in the first phase of the work of the TWG and draws on the recent IEEP report for DG Agriculture and Rural Development, 'The Provision of Public Goods through Agriculture in the European Union' (Cooper et al, 2009). As part of that study, an assessment of the range of environmental public goods provided through different types of agriculture in the EU is provided and the role of the full range of CAP measures in the provision of environmental public goods is examined.

This analysis has been conducted under the auspices of the European Network for Rural Development, and the purpose is to consider in greater depth the role and potential of **Rural Development policy** under Pillar 2 of the CAP to deliver public goods associated with agriculture. There is a considerable range of such public goods including those in the environmental and social categories, aspects of food security and animal welfare. However, **this study focuses particularly on environmental public goods** as a good illustration of how policy can deliver one important category of public goods. However, the role of rural development policy in delivering **rural vitality**, where this is associated with agriculture, is also considered, albeit in less depth given the more limited availability of information on the social public goods associated with agriculture. As the remit of the TWG is confined to those public goods that are associated with agriculture, public goods and rural development measures associated with forestry, although potentially significant, have not been examined.

The report highlights the importance of particular rural development measures in addressing a range of environmental and social challenges, identifies the way in which these measures are used in different parts of Europe, and considers more briefly what factors contribute to the successful implementation of rural development measures on the ground. It draws on a desk based review of all 88 RDPs and the measures that are implemented within them and a questionnaire survey that was conducted with officials in 14 Member States. It provides a catalogue of the way in which Member States have planned to use relevant rural development measures over the 2007-13 programming period¹ and the degree to which these are anticipated to help to deliver a range of environmental and social public goods. The methodology used to collect the data that forms the basis of this report and caveats in relation to its interpretation are set out in Annex 1.

Given the link between land management practices and the provision of public goods identified in the DG Agriculture Study (Cooper et al, 2009), this report attempts to identify the range of farm level actions that are encouraged by individual rural development measures to provide a more accurate means of establishing the relationship between specific rural development measures and the delivery of public goods. The analysis of the role of these measures in stimulating the provision of public goods depends to a large extent on the presentation of the measures by Member State authorities in the RDPs and on the judgement and interpretation of the experts who participated in screening the RDPs.

The purpose of the report is to provide a more detailed analysis than has been available previously of the potential contribution of RDPs as a whole and individual rural development measures in particular to the provision of specific public goods in different regions of the European Union. It also considers the extent to which the use of these measures for the provision of environmental public goods can also bring about socio-economic benefits. What this analysis does not attempt to do, however, is to provide an evaluation of the success of measures in achieving environmental or social outcomes. Given the prospective nature of the RDPs, our analysis focuses on the potential for individual

¹ The review of the RDPs did **not** take into account any changes to rural development programmes in response to the 'new priorities' set out in the CAP Health Check, although the analysis takes into account the proposed use of the additional funds as a result of the Health Check agreement, as far as this is possible.

measures and groups of measures to deliver public goods over the 2007-13 programming period. This will differ somewhat from assessments of actual performance of measures on the ground, such as those from existing evaluation literature on the performance of measures in the previous programming period (see Dwyer et al., 2008) and initial indications of the environmental impacts of RDPs within the current programming period (for example, BirdLife, 2009).

While this report is concerned exclusively with rural development measures it is clear that other elements of the CAP can contribute to the provision of public goods by agriculture. Most or all farms in Europe have the potential to deliver public goods, and measures from both pillars of the CAP, have a role to play in supporting their provision, albeit to varying degrees. Under Pillar 1, cross compliance standards of Good Agricultural and Environmental Condition and the requirements for permanent pasture as well as certain elements of Article 68, where support is provided for 'specific types of farming which are important for the protection or enhancement of the environment', or for funding additional agri-environment measures, can all contribute to the delivery of public goods. In addition, where decoupled direct payments make a critical contribution to the economic viability of farms, they help to keep farming activity in place through their role in supporting and stabilising farm incomes. This is a precondition for being able to apply more targeted actions for public goods provision through Rural Development measures and in this way, direct payments can contribute indirectly to the supply of public goods (Cooper et al, 2009).

An overview of the data that informs the analysis in this report is set out in a separate document, the '*Overview of RDP Screening Exercise and Member State Survey*'. This report provides information on the methodology for the collation of data, the key findings emerging from the screening of the 88 RDPs across the EU-27, together with the results of the Member State Survey.

This report:

- provides a brief overview of the concept of public goods, identifying those associated with agriculture (Chapter 2);
- explores the relationship between agricultural activity and the provision of public goods and identifies the drivers influencing their supply Chapter 3);
- assesses the degree to which RDPs and individual rural development measures encourage the provision of environmental and social public goods in the EU-27 (Chapter 4);
- highlights a range of the socio-economic benefits that measures supporting the provision of environmental public goods can provide (Chapter 5); and
- considers some of the criteria that lead to the successful delivery of public goods through rural development policy (Chapter 6).

2. What are public goods?

The public goods concept is long established in economic theory. Public goods exhibit two defining characteristics, and are:

- **Non-rival** – if the good is consumed by one person it does not reduce the amount available to others.
- **Non-excludable** – if the good is available to one person, others cannot be excluded from the benefits it confers.

The public goods concept is important because it provides clarity in distinguishing whether or not there is a case for state intervention in the provision of certain goods and services. While private goods can be secured through the market, this is not the case for public goods where markets cannot function properly in terms of balancing supply and demand. The characteristics of non-excludability and non-rivalry in consumption mean that users of public goods have no incentive to pay for them, which can lead to their over-exploitation, and on the supply side, farmers have little incentive to provide public goods because they are not being paid to do so. Therefore, in the absence of functioning markets, some form of public intervention is needed to secure a desirable level of provision of public goods in line with societal demand.

Unless such demand is met by incidental provision, as a side-effect of economically viable agricultural activities, and where the actions required go beyond legislative requirements, economic incentives will need to be provided to farmers to encourage them to reallocate their factors of production away from the production of agricultural commodities in order to provide public goods. For a more detailed elaboration of the public goods concept and its relevance for agriculture, please see the conceptual paper developed as part of the work of the Thematic Working Group in 2009 (TWG 2009)².

Although the term 'public goods' is not formally used in documentation setting out the rationale for intervention within the Rural Development Regulation (Council Regulation 1698/2005) or the Community Strategic Guidelines for Rural Development (Council Decision 2006/144/EC), many of the priorities identified as requiring action are consistent with this concept, with payments only justified where the actions go beyond those required by law.

The IEEP study identified 12 key public goods that are provided by agriculture in the EU, nine environmental public goods and three 'social' public goods, all of which share the characteristics of non-rivalry and non-excludability to varying degrees³. These 12 are considered to be the most significant public goods associated with agriculture in the EU, although the list is not exhaustive.

Ten of these public goods are considered within the context of this report, as agreed by the TWG. Whilst important, food security is only considered in passing in this report, and only in the sense of considering those actions that are needed to ensure the maintenance of a robust resource base for sustainable food production in the future. This is not to say that other elements of food security do not have public good characteristics. As highlighted in Cooper et al (2009), for example 'Access to affordable and safe food is an important public good. Although markets are the best regulators of food supply, there are hazards arising from a potential shortfall in supply that do not arise with other commodities less central to human welfare'. However, the question arises as to what aspects of food security warrant some form of intervention. Uneven access to food is often the result of a lack of purchasing power or inadequate distribution both within and between countries, rather than the result of an absolute shortage in supply (Sen, 1997; 1999; Swinnen, 2009a). In the short term the threat of food insecurity in Europe remains fairly low, and as there is no issue of undersupply: what is critical, however, is to ensure the maintenance of a sustainable resource base, including safeguarding water supplies, managing the land to improve its resilience to flooding, maintaining soil fertility, and safeguarding the integrity and resilience of ecosystems as a means to secure the long term capacity of the land to produce food in Europe over the longer term (House of Commons Efra Committee,

² See also Chapter 1 of the recent study for the European Commission on Public Goods and the CAP (Cooper et al 2009).

³ For an elaboration of the characteristics of each of these environmental and social public goods, see Chapter 2 of Cooper *et al.*, 2009.

2009; SDC, 2009). Many of these issues are public goods in their own right, and where there is evidence of undersupply, support for their provision is justified.

For this reason, the analytical focus of this report is environmental public goods and rural vitality, as these are the main public goods addressed by the RDPs. Food security is only dealt with insofar as the provision of these public goods contributes to maintaining a sustainable resource base to ensure long term productive capacity of agricultural land. The public goods that form the focus of this report are set out in Table 1.

Table 1 The public goods that form the focus of the TWG3 work

Selected public goods for the TWG study	
1	Agricultural landscapes
2	Farmland biodiversity
3	Water quality
4	Water availability
5	Soil functionality
6	Climate stability - carbon storage
7	Climate stability - greenhouse gas emissions
8	Air quality
9	Resilience to flooding and fire
10	Rural vitality

3. The relationship between public goods and agriculture

This chapter explores the characteristics of these forms of agriculture, focusing specifically on their potential to provide public goods in the field of the environment. It proceeds to consider the relationship between agriculture and rural vitality. It then examines the drivers affecting the supply of these public goods as identified in the RDPs and by respondents to the Member State survey.

3.1 The association between farming practices, farming systems and the provision of environmental public goods

There is a wide range of farming practices that provide environmental public goods and whose continuation is vital if these public goods are to be delivered at the level demanded by society. The following characteristics are important in influencing the scale of public good provision:

- Appropriate land management which is particularly critical.
- The type of land use and intensity of land management.
- The structure of farms, including field size and scale of operation - these influence the production logic as well as landscape structure.
- Locational factors – farm location in relation to water courses, more natural features, groundwater resources, combustible forest, and within a coherent landscape.
- Historical factors – relic landscape elements, archaeological features.
- Socio-economic structures – for example, semi-subsistence farming.

Based on the evidence, it appears that the more extensive farming systems are associated with a larger number of farming practices providing a greater range of environmental public goods, compared to highly productive farming systems. The occurrence of grazing livestock within a system, both in extensive and more intensive systems, will in many cases enhance its contribution to environmental public goods. The precise pattern of provision, however, depends on the type of public good under consideration and on geographic location and local conditions, meaning that the scale of public good provision within farming systems will vary between different regions.

Turning from farming systems to individual practices for managing land and other agricultural resources, the evidence shows that there is a considerable range of farming practices that provide public goods, both in the crop and livestock sectors. Some are found throughout Europe, others are more associated with particular regions. The range of beneficial farming practices will undoubtedly change over time as emerging technologies provide new possibilities for enhancing the environmental value of specific practices, for example, by improving energy efficiency. Two categories of practices have been identified as being most associated with the provision of public goods:

- Those that are inherently less intrusive on the environment, for example, those that do not involve deep cultivation, irrigation, heavy input use, the removal of semi-natural vegetation, etc. Many correspond to more traditional extensive practices but also include some modern ones (for example, drip irrigation).
- Those that are designed to address a specific environmental concern, for example, the use of buffer strips, skylark scrapes, or slurry injection.

Many management practices provide multiple public goods. For example, out of a total of 66 farming practices identified as beneficial for the provision of public goods, a third were recorded as providing five or more environmental public goods, with 13 per cent providing up to seven public goods each, including:

- the retention of field boundaries;
- growing crops with lower nutrient / water requirements;
- the use of green manure and/or cover crops;

- including a high proportion of fallow within the crop rotation;
- maintaining a high proportion of semi-natural vegetation on the farm;
- outdoor grazing of livestock;
- maintaining flood/water meadows;
- practising transhumance; and
- using shepherding to avoid under- or overgrazing.

Some of these practices, such as the retention of field boundaries, are applicable in a wide range of farming systems over a large area of the farmed countryside, whereas others, such as transhumance practices, are associated with a more limited range of farming systems. The types of public goods that are most commonly provided together through the use of these farming practices include farmland biodiversity, water quality, soil functionality and agricultural landscapes.

3.2 The relationship between agriculture and rural vitality

The character of rural areas in Europe is highly diverse (OECD, 2006). This reflects differences in climate and biotic factors, as well as population profile, economic prosperity, language, cultural heritage, traditions and customs, land use and management and the character of natural assets. Given this diversity, a broad concept such as rural vitality may seem simplistic or misplaced, however it represents a particular mix of constituent parts – many of which are regionally and locally specific - which together contribute to the sustainability of rural areas and communities, ensuring their long-term viability and attractiveness as places to live, work and visit.

Rural vitality is a composite entity, comprising social, cultural and economic dimensions. It arises when there is a sufficient critical social mass to sustain valued and place-based rural customs, traditions and heritage, to maintain the services and infrastructure relied upon by rural populations—such as schools, doctors and transport links, as well as serving as a repository of skills and knowledge which help to keep alive rural cultures and to sustain social networks with sufficient robustness and integrity to adapt to the many pressures facing rural communities. There is a strong link between rural vitality and 'place'. The land, the character of the surrounding landscape, climate and other natural assets all form an important resource base that shapes customs, traditions and identity and therefore constitutes an inherent part of 'rurality' and contributes to the vibrancy of rural areas. Social capital, takes several forms but it is generally characterised by well-functioning social networks and active community engagement accompanied by a range of skills and knowledge. It fosters the conditions for social, civic and economic well-being, a core component of rural vitality.

Not all regions and rural communities demonstrate these characteristics, however. Certain rural communities are dwindling as a result of an exodus of younger people leaving rural areas to find work in urban centres, leaving them with a skewed age structure, low employment opportunities and fractured social networks, leading to social exclusion and the loss of skills and local knowledge, with insufficient social mass to sustain vital services. Where 'rural vitality' is impoverished, negative consequences for the socio-economic performance of rural areas can be expected. Strengthening or developing rural vitality depends essentially on capacity building, aiming to encourage an active involvement of rural actors. This concerns in particular the building of human capital, providing information, and establishing social networks and inclusive communication mechanisms.

Rural vitality is not inherently linked to any particular sector or land-based activity, although in the past, the people employed in the land management sectors, such as agriculture and forestry, have made up a large proportion of the rural population in most of Europe. The links between agriculture and rural vitality are variable in different regions of the EU. Perhaps they are most significant in certain regions of Spain, Italy, Greece, and in large parts of the new Member States, where agriculture continues to be one of the principal forms of permanent employment, thereby sustaining the local rural economy and creating the critical social mass and networks so central to fostering rural vitality. In these areas agriculture continues to be fundamental to the rural identity and vibrancy of the rural area. It drives economic activity, such as local markets, provides employment opportunities and the farming population often play active roles in village life. In other areas, even where

agriculture's share of the workforce has dwindled and other sectors play a more important role in the rural economy, the social networks, customs and traditions of communities continue to be influenced by their agrarian past. This is the case in countries such as France, where these traditions survive in the form of poetry, literature, music and are expressed in locally-distinctive place-based products, with a distinct quality and character which forms an important part of the rich cultural heritage of many rural areas.

While agriculture can help to sustain rural vitality, through the role that the farming population and associated rural activities and traditions make to rural areas, rural vitality is also in itself a precondition for the continuation of farming practices in many more remote and disadvantaged parts of the EU-27. For example, where extreme levels of rural depopulation are experienced this also leads to the loss of local services such as schools, local transport, local abattoirs or processing facilities as well as local markets for their produce, which ultimately can make it unviable for farmers to continue to farm in these areas. By contrast where rural areas remain economically and socially vibrant, this can help to support the continuation of economic activities such as agriculture and forestry, which in turn are important in providing environmental goods and services, such as cultural landscapes and farmland biodiversity, upon which many sectors – such as rural tourism and recreation – depend, and which are so highly valued by the European public.

As such, rural vitality - in all its facets - is valued by society in the EU and permits rural areas to serve as a counterpoint to urban life. The concept of territorial cohesion itself implies the value based on sustained variety and consequently a greater attention to place-based approaches to policy making. In many situations there is no incentive for the market to supply many of the components of rural vitality since, although it is considered important by society as a whole to maintain vibrant rural areas, in the case of the rural services that are required to maintain rural populations, for example, the demand is insufficient for it to be commercially viable to provide these through the market. Certain elements of rural vitality exhibit the characteristics of a public good very clearly. These included local capacity, skills and knowledge, which are central to underpinning the long term sustainability of rural communities. The degree to which rural vitality is self-sustaining or requires public support to prevent its decline will vary from region to region, although the need for support to enhance capacity in rural areas is likely to be universal. In the sections that follow, we explore the drivers affecting the supply of the various facets of rural vitality associated with agriculture, and in Chapter 4 consider those measures funded under EAFRD which serve to maintain rural vitality in certain rural areas across the EU.

3.3 The key drivers affecting the supply of public goods

Estimates of the current scale of public goods provision through EU agriculture are notoriously difficult to derive, but there is evidence of an undersupply of these environmental public goods when compared to public demand, as articulated through policy targets, objectives and goals.

Where changes in environmental quality are attributable to agriculture, one of the key contributing factors will often be changes to management practices. Environmental improvements arise from the continuation or restoration of beneficial land management, whereas a decline arises from the discontinuation of these same practices, such as the removal of landscape features resulting in the loss of habitats for certain species.

Conditions clearly vary within and across Member States, but the two broad trends that result in the deterioration in environmental media, as well as a decline in rural vitality in agricultural areas, are marginalisation and abandonment, and intensification/concentration of production. Indeed, a recent review of the impacts of agricultural practices on the terrestrial and aquatic ecology of a number of EU-27 Member States concludes that 'despite successive reforms of the CAP, efforts to improve the environmental sustainability of agricultural systems are compromised by intensification and abandonment' (Stoate *et al.*, 2009).

One of the main reasons for the undersupply of public goods is that, in the absence of functioning markets for their provision, they are often competing with a range of economic interests. Identifying the drivers that are influencing the undersupply of public goods enables policy measures to be put in place that provide suitable economic signals to encourage private resources to be used in a way that

enables public goods to be delivered, in line with societal demand. Information from the review of the 2007 – 2013 RDPs and a survey of experts in selected Member States identified a range of drivers that are adversely affecting the supply of public goods associated with agriculture. These are set out in Table 2 and subsequently discussed for different groups of public goods.

Table 2 Examples of a range of drivers affecting the supply of public goods

Drivers adversely affecting supply	Examples of public goods affected	Member States which highlight drivers of undersupply as being addressed through their RDPs
Marginalisation and land abandonment	Landscape, Biodiversity, Soil functionality (in arid regions), Resilience to fire Rural vitality	<ul style="list-style-type: none"> RDPs in EU-15 countries including Austria, Germany, Greece, Ireland and many Mediterranean regions in Italy and Spain. EU-12 countries including Bulgaria, Estonia, Latvia, Romania, Slovakia and Slovenia;
Specialisation/ concentration of production	Landscape, Biodiversity, Water Quality Water Availability Soil functionality, Carbon Storage Resilience to flooding and fire	<ul style="list-style-type: none"> RDPs in the majority of the EU-27
Habitat loss and/or fragmentation	Biodiversity, Landscape, Climate Stability	<ul style="list-style-type: none"> RDPs in most EU-15 countries including Germany, Italy and Spain; RDPs in 5 EU-12 countries: Cyprus, Latvia, Lithuania, Poland and Slovakia.
Soil erosion	Soil Functionality, Water Quality, Biodiversity, Landscape	<ul style="list-style-type: none"> RDPs in about half of EU-15 countries including Finland, France, Germany, Greece, Italy, Portugal and Spain; RDPs in 5 EU-12 countries including Hungary, Poland, Romania, Slovakia, Slovenia.
Desertification		
Salinisation		
Eutrophication	Water Quality, Soil Functionality, Biodiversity	<ul style="list-style-type: none"> RDPs from all EU-15 countries, RDPs from 9 EU-12 countries including Bulgaria, Cyprus, Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania and Slovenia.
Diffuse pollution		
Water demand, especially for irrigation	Water Availability	<ul style="list-style-type: none"> Mediterranean countries including Cyprus, France, Greece, Italy, Malta, Portugal and Spain RDPs in a range of other countries such as UK, Germany, Estonia, Poland and Romania as well as overseas French RDPs.
Declining and aging rural population	Rural vitality	<ul style="list-style-type: none"> RDPs in all EU-15 countries, RDPs in 9 EU-12 countries including Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia.
Difficulty accessing markets		
Rural unemployment		
Lack of rural services and infrastructure		

Source: 2007-13 RDP Screening Exercise for TWG3

RDPs address the undersupply of public goods by providing incentives to encourage those management practices or investments that have the potential to deliver specific public goods. Some

examples of the sorts of activities that are prioritised by Member States to counter the drivers of undersupply in relation to specific public goods are set out below.

3.3.1 Agricultural landscapes and farmland biodiversity

Maintaining valued agricultural landscapes and preserving farmland biodiversity are addressed in about three quarters of RDPs. In most situations, the measures aim to reverse trends towards the marginalisation and abandonment of agricultural land or the intensification and concentration of agriculture.

Ensuring the continued management of agricultural land is a pre-condition for preserving landscapes from both a cultural and ecological perspective. Mountain and other naturally disadvantaged areas dominated by extensive grazing appear to be most important in this context. Incentivising alternatives to the intensification of farming is identified as a priority in certain lowland areas, as well as some areas close to large urban centres.

Encouraging farmers to preserve and enhance habitats for biodiversity is highlighted in around half of RDPs for a variety of reasons, including combating the negative effects of further abandonment of agricultural land and the intensification of agricultural production, as well as helping to avoid the fragmentation of habitats, forest fires, urban sprawl and, in Greece, desertification. The threat of invasive or alien species is only mentioned in a few RDPs, predominantly the southern island RDPs for example, Malta, Sicilia (Italy) and the Azores (Portugal). However, nearly a quarter of RDPs consider the need to preserve genetic diversity, and particularly local species or breeds, to be an issue. In some cases, the RDPs make specific mention of the need to preserve bird species (Basilicata, Italy) or plant species (Puglia, Italy). In some RDPs, the preservation of plant species is considered to be likely to affect the capacity of the environment to adapt to climate change in the future.

3.3.2 Soil functionality, water quality and water availability

Maintaining well-functioning soils and improving the quality of water is highlighted as a priority that needs addressing in many Member States, especially the New Member States. Encouraging more sustainable use of water is highlighted in RDPs in more arid parts of the EU-27, particularly the Mediterranean Member States.

In relation to soil functionality, about 50 per cent of RDPs recognise the need for measures that can help reduce soil erosion. Specific management that is highlighted as a priority in this regard includes the maintenance of landscape features, such as terraces and maintaining the active management of grassland, and avoiding its conversion to cereal production. Over three quarters of RDPs identify the need to improve water quality, largely through encouraging reduced use of pesticides, artificial fertilisers and manure in order to reduce the leaching of nitrates and phosphates into water courses. Ensuring the sustainable use of surface and groundwater supplies is highlighted as a priority in some of the drier parts of the EU-27, particularly the Southern Member States, where there is a need identified for measures that can help to reduce the demand for water use, particularly in relation to the demand from very specialised and high value crops, as well as finding sustainable solutions for minimising water use in the face of anticipated higher demand as a result of climate change.

3.3.3 Climate stability

Maintaining the current Carbon storage capacity of agricultural soils and semi-permanent vegetation and increasing Carbon sequestration are recognised as important means of mitigating rising concentrations of atmospheric CO₂, and to prevent further increases in global temperature. Despite this, however, hardly any RDPs highlighted specific issues of undersupply in relation to carbon storage, despite the fact that many of the measures used within the RDPs can and do address this issue.

The need to reduce fossil fuel usage for power and in mineral nitrogen fertilisers, as well as the emissions of methane associated with the livestock sector were highlighted as issues that needed addressing in a few RDPs in order to reduce GHG emissions from agriculture. Specific management that was noted as being needed to address issues of undersupply of this public good included the maintenance of wet grasslands and other wetland areas, reduced use of mineral fertilisers and manure spreading as well as finding ways of minimising methane emissions from livestock.

3.3.4 Resilience to flooding and fire

Maintaining the on-going management of agricultural land is seen as critical to avoid increased risks of forest fires. This is particularly highlighted in the RDPs of Mediterranean Member States, as well as countries such as Romania, Poland and Slovakia, where a build-up of biomass, particularly in areas of extensive grazing, can lead to more extensive and damaging fires. Ensuring the on-going management of agricultural land as well as incentivising less intensive management practices is also highlighted as being important in many Member States as a means of improving the resilience of the land to the risk of flooding, which is likely to be exacerbated by climate change.

3.3.5 Rural vitality

Retaining a sufficient population density in rural areas to underpin local services and infrastructure as well as to keep alive rural customs, traditions and heritage is key to maintaining rural vitality. This is highlighted as a priority in over three quarters of the RDPs reviewed in 22 Member States. In some areas, where rural vitality and the agricultural sector are closely interlinked, encouraging the on-going management of agricultural land is also identified as important to provide employment opportunities locally to avoid outmigration. In other areas, the importance of stimulating diversification and inward investment is highlighted.

Also central to ensuring rural vitality is the development of capacity within rural communities to build human capital and increase the skills and knowledge base to enable them to adapt and change to the pressures facing rural areas. The need for RDP measures to incentivise these sorts of activities is highlighted in many programmes, in particular in the new Member States.

4. The role of Rural Development policy in delivering environmental and social public goods

The European Agricultural Fund for Rural Development (EAFRD) is the policy instrument that has the most potential to actively encourage the provision of public goods through a deliberate and targeted approach. With €151 billion allocated to rural development over the 2007-13 programming period, including national co-financing, it provides by far the largest source of funding to encourage the delivery of specific public goods associated with agriculture in Europe. The capacity to deliver public goods, however, is very dependent on the way in which Member States design their Rural Development Programmes (RDPs), the actions that they choose to prioritise, the eligibility criteria they use, the way that measures are designed and targeted and the way in which schemes are delivered on the ground.

One of the strengths of rural development policy is its programming approach, whereby a framework of strategic priorities and guidelines for implementation, monitoring and evaluation is set at the EU level, with Member States given considerable flexibility to determine which measures they choose to implement and the means of implementation in order to meet the needs of particular areas. There is only one compulsory rural development measure - the agri-environment measure. However, given the breadth of the objectives of rural development policy, incorporating competitiveness, environmental and social objectives, and the differing degrees to which economic, social and environmental issues take priority in different Member States, there is great deal of variation in the way in which the delivery of environmental and social public goods is approached in individual RDPs.

While this report has broken down the information available to identify which measures have been identified as being used for the delivery of specific public goods, it is important to recognise that in reality individual measures, and the actions funded through them, have the potential to deliver multiple benefits simultaneously – for example improvements in water and soil quality and biodiversity benefits, alongside the reduction of GHG emissions. Recognition of these synergies is critical to enable the pursuit of multiple public goods in an integrated manner, to maximise the benefits achieved and to minimise the risk of conflicts between public goods occurring.

4.1 The priority attributed to different types of public goods within RDPs

Table 3 offers a simple numerical count of the number of measures being prioritised in this way, not a weighted judgement on the significance of different measures. It should be noted that 52 of the 88 RDPs apply in Germany, Italy and Spain, so preferences in these Member States have a major impact on the European picture.

However, care should be taken with interpreting the figures shown in Table 3. The number of measures that are ear-marked to be used to supply a particular public good is not a reflection of the relative priority given to a particular public good. Nor does it provide information on the way in which the public good is targeted within the programme or the effectiveness in delivering it in practice. To assess this, more detailed information would be needed to establish which particular measures are used, what sort of actions they prioritise, which public goods they address, what funding they receive, how the measures and actions are designed and implemented in each RDP and the impacts on the ground.

The broad picture emerging from this exercise can be summarised as follows:

Environmental public goods: Five environmental public goods stand out as being identified as a priority for incentives within the majority RDPs according to the experts. These are: carbon storage, greenhouse gas emissions, agricultural landscapes, farmland biodiversity and water quality. Soil functionality is also identified as a priority in a significant number of RDPs, including those from most Mediterranean countries but also the majority of Länder in Germany, the Czech Republic, and others.

Table 3 concerning climate related public goods probably over-represent their use compared to the other public goods. This is because they were reviewed, assessed and included as part of a separate survey exercise.

Improving water availability, by contrast, only occurs as a significant objective in relatively few Member States, predominantly Mediterranean countries including Cyprus, Italy (about half of all RDPs), France, Greece, Portugal, and all RDPs in Spain. Air quality and resilience to flooding and fire is also a lesser priority, featuring in a small number of RDPs, representing a mix of Member States.

Farmland biodiversity and agricultural landscapes are identified as being prioritised by the highest number of individual measures within RDPs (30 and 29 measures respectively out of a total of 36). Carbon storage and reductions in greenhouse gas emissions are the focus of the smallest number of individual measures. Axis 2 measures are, unsurprisingly, the main mechanism for delivering environmental public goods, including maintenance of agricultural landscape and farmland biodiversity, followed by water quality, reduced greenhouse gas emissions, carbon storage and soil functionality. Some measures, for example the agri-environment measure, are expected to deliver all or most of these public goods in many RDPs. Others are more narrowly focused, such as the Natura 2000 measure, which is focused predominantly on delivering biodiversity. Reduced greenhouse gas emissions and improvements to water quality tend to be the main focus of selected Axis 1 measures. Agricultural landscapes and farmland biodiversity are also prioritised through Axis 3 through the measure for supporting the conservation and upgrading of rural heritage.

Rural vitality: Rural vitality, defined in rather broad terms, is the key social public good noted as a priority in almost all RDPs. It is also the public good prioritised by the highest number of individual measures, with 31 of a total of 36 being identified as having rural vitality as a focus. Axis 3 and 4 measures are the main measures for maintaining and increasing rural vitality although the expert assessment showed that rural vitality should benefit significantly from Axis 2 measures as well, particularly the natural handicap and the agri-environment measures. In addition, certain Axis 1 measures are also identified as benefiting rural vitality, with investments to improve the competitiveness of the agricultural sector often also contributing to the economic vitality of rural areas more generally.

Table 3 Number of Measures expected to deliver selected public goods by axis, together with the number of times measures are identified in all 88 RDPs

Axis	Selected Public Goods									
	Agricultural Landscapes	Farmland Biodiversity	Water Quality	Water Availability	Soil Functionality	Climate Stability - Carbon Storage	Climate Stability - Greenhouse Gas Emissions	Air Quality	Resilience to Flooding and Fire	Rural Vitality
Axis 1										
Number of Measures used (out of total of 16)	13	14	11	10	13	5	5	9	5	14
Total number of measures identified in all 88 RDPs	167	164	252	208	217	68	256	206	70	294
Axis 2										
Number of Measures used (out of total of 6)	5	5	5	4	5	4	4	5	4	5
Total number of measures identified in all 88 RDPs	182	184	143	84	158	124	126	89	63	151
Axes 3 & 4										
Number of Measures used (out of total of 14)	11	11	7	6	6	0	4	8	6	12
Total number of measures identified in all 88 RDPs	277	128	50	19	35	0	53	45	20	492
Total										
Number of Measures used (out of total of 36)	29	30	23	20	24	9	13	22	15	31
Total number of measures identified in all 88 RDPs	626	476	445	311	410	192	435	340	153	937
Total number of RDPs with objectives relating to each public good	84	80	79	40	61	87	88	36	23	85

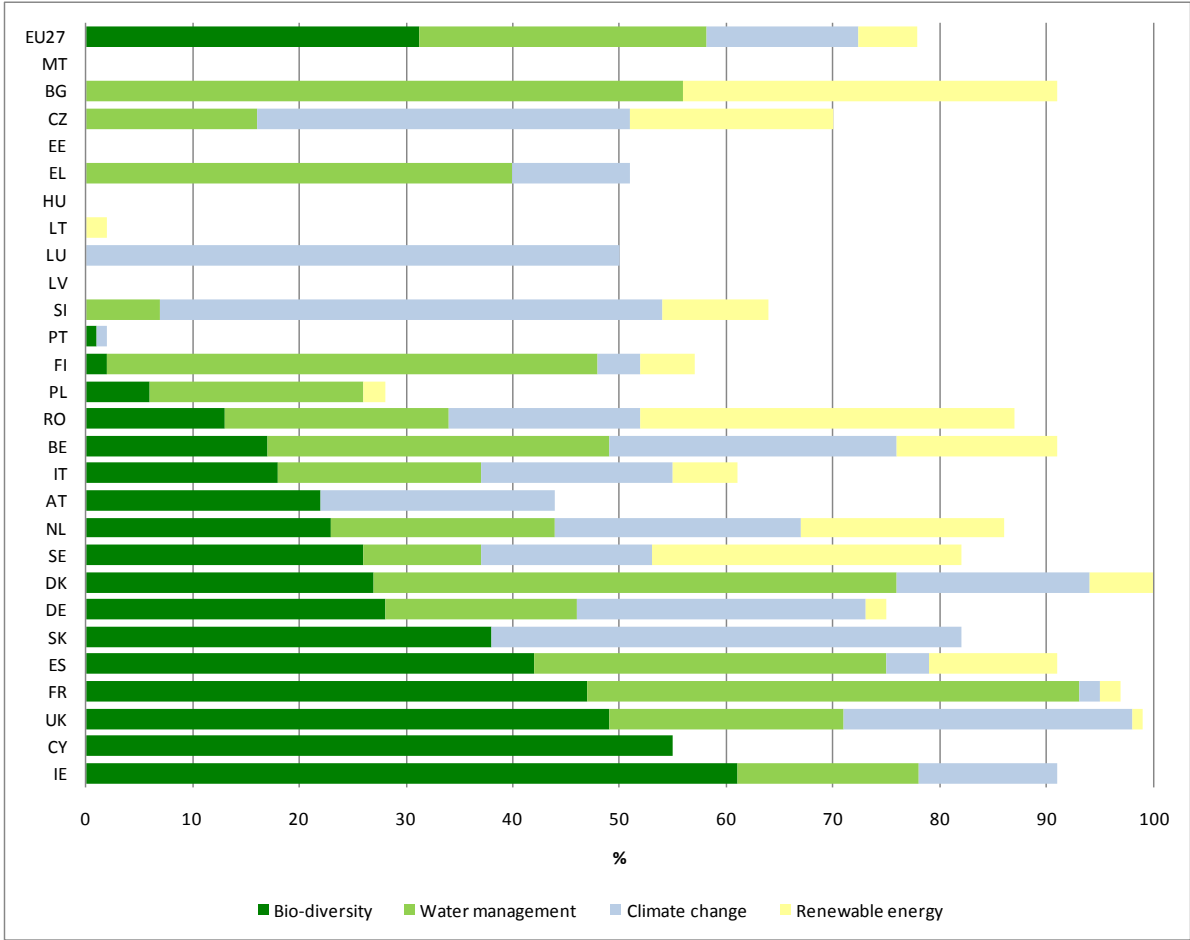
Source: 2007-13 RDP Screening Exercise for TWG3

4.2 Distribution of the EAFRD budget

It is not possible to break down the total EAFRD budget according to specific environmental priorities. However, data are available on the relative budgetary priority given to the principal elements within the additional funding allocated to the 'new challenges' as a result of the CAP Health Check in 2009. These may provide some indication of the priority given to specific environmental issues within RDPs and between Member States. This information is set out in Figure 1 and shows that, for the EU as a whole, the largest proportion of funds will be concentrated on biodiversity (31 per cent) and water management (27 per cent), with measures focused on climate change priorities accounting for 14 per cent of the total amount of additional funding. However, these overall figures mask some significant differences between Member States. For example, biodiversity has not been prioritised by the majority of new Member States, with eight of the twelve not using the additional funds to target biodiversity at all. Indeed four Member States (Malta, Estonia, Hungary and Latvia) have chosen not to allocate funding to any of the environmental challenges, with Lithuania and Portugal allocating less than 5 per cent of their additional resources, choosing instead to prioritise dairy restructuring and increasing broadband coverage.

Biodiversity is the main focus (over 30 per cent) of the additional funding in Member States such as Slovakia, Spain, France, the UK, Cyprus and Ireland. Water management is seen as a particular priority in countries such as Bulgaria, Greece, Finland, Denmark, France, Belgium and Spain, with climate change activities prioritised in a number of the new Member States, such as the Czech Republic, Slovenia and Slovakia as well as some of the EU-15, such as Luxembourg, Belgium, Germany and the UK.

Figure 1 Overall distribution of CAP Health Check and EERP funds (€4.95 billion) between priorities, based on approved RDP modifications



Source: IEEP own calculations based on data within DG Agriculture’s Press Release IP/10/102

Note: These figures do not include national co-financing

4.3 Most frequently used measures for the delivery of public goods

The rural development measures that have been identified as being used for providing environmental and social public goods from the four axes can be divided into three broad categories:

- Area based payments that provide incentives to farmers to carry out beneficial land management practices, for example the agri-environment measure, natural handicap measures and the Natura 2000 measures.
- Investment aid that provides assistance with the costs of physical capital investment, for example, the farm modernisation and infrastructure development measures under Axis 1 and the grants for funding activities in rural areas more generally, such as maintaining and promoting the natural heritage, supporting farm diversification, or tourism activities in Axis 3.

- Measures that provide advice, training and capacity building to improve human capital, for example, in the training and advice measures in Axis 1 and 3.

The analysis in this section draws on the review of the RDPs undertaken by experts to provide an indication of the *potential* contribution of individual rural development measures to the provision of environmental and social public goods through agriculture in different regions of the European Union. Based on their interpretation of all the RDPs, 16 measures from all Axes have been identified as being prioritised most frequently for delivering the public goods under analysis.

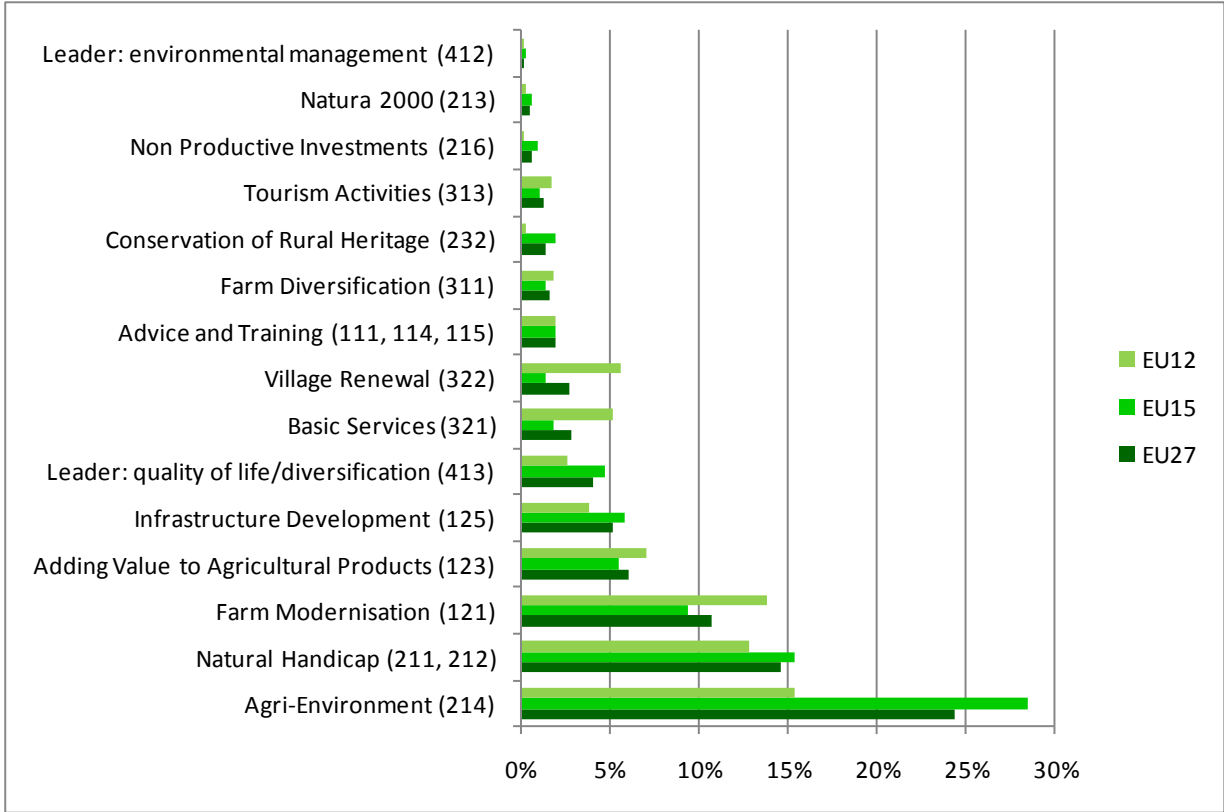
These include 11 measures with the potential to encourage the provision of environmental public goods and eight with the potential to encourage the provision of rural vitality. These measures are set out in Table 4 where they are differentiated in terms of the type of payment they provide and the degree to which they have a direct or partial focus on any given public good or on groups of public goods.

Table 4 Most frequently used measures for the delivery of selected environmental public goods and rural vitality

	Payment Type	Degree of Focus	Rural Development Measures
ENVIRONMENTAL PUBLIC GOODS	Area based land management payments	Direct	<ul style="list-style-type: none"> • Agri-environment measure (214)
		Partial	<ul style="list-style-type: none"> • Natural handicap measures (211, 212) • Natura 2000 measure (213)
	Capital investment in physical infrastructure	Direct	<ul style="list-style-type: none"> • Non-productive investments (216)
		Partial	<ul style="list-style-type: none"> • Farm modernisation (121) • Infrastructure development (125) • Semi-subsistence farming (141) • Conservation and upgrading of the rural heritage (323)
		Indirect	<ul style="list-style-type: none"> • Adding value to agricultural products (123) • Diversification (311)
	Advice, training and capacity building to improve human capital	Direct	
		Partial	<ul style="list-style-type: none"> • Advice and training measures (111, 114, 115)
RURAL VITALITY	Area based land management payments	Direct	<ul style="list-style-type: none"> • Natural handicap measures (211, 212)
		Partial	
		Indirect	<ul style="list-style-type: none"> • Agri-environment measure (214)
	Capital investment in physical infrastructure	Direct	<ul style="list-style-type: none"> • Farm diversification (311) • Encouragement of tourism activities (313) • Basic services for the economy and rural population (321) • Village renewal (322)
		Partial	<ul style="list-style-type: none"> • Adding value to agricultural products (123)
		Indirect	<ul style="list-style-type: none"> • Farm modernisation (121) • Infrastructure development (125) • Semi-subsistence farming (141)
	Advice, training and capacity building to improve human capital	Direct	<ul style="list-style-type: none"> • Leader approach (411, 412, 413)
		Partial Focus	<ul style="list-style-type: none"> • Training and information (331)
		Indirect	

Of these, three measures (the agri-environment, natural handicap and farm modernisation measures) account for almost 50 per cent of total allocated public expenditure across all 88 RDPs for the programming period 2007 – 2013 (Figure 2). It is these three measures, therefore, that form the main focus of the analysis below, with reference to other selected measures where these are highlighted by the expert assessment of RDPs as being relevant for the maintenance of improvement of the supply of public goods, particularly selected Axis 3 measures in relation to rural vitality.

Figure 2 Proportion of total public rural development expenditure per measure for the EU-15, EU-12 and EU-27



Source: IEEP calculations based on programmed expenditure within individual RDPs for 2007-13, including national co-financing and additional Health Check and EERP funds.

4.3.1 Area based land management measures

There are three main measures that are associated with providing support for environmental land management activity on agricultural land, either directly or partially. These are the agri-environment measure, the natural handicap (LFA) measures and the Natura 2000 measure and all sit within Axis 2 of the EAFRD. Area based measures also exist for the environmental management of woodland and forestry but these are not within the scope of this study.

The focus of these area based measures tends to be primarily on maintaining and enhancing farmland biodiversity and agricultural landscapes, although increasingly, the land management practices that are supported under the agri-environment measure also prioritise improvements to water quality, soil functionality and carbon storage. In addition, by encouraging the continued management of agricultural land, they contribute indirectly to rural vitality.

The result indicator targets for those Axis 2 measures that focus on the management of agricultural land in the EU-27 provide an indication of the total area and proportion of agricultural land that is predicted to be under successful land management contributing to biodiversity, the avoidance of marginalisation, water quality, soil quality and climate change as a result of the implementation of these measures (Table 5). This demonstrates the significant contribution of the Axis 2 land management measures to the maintenance and improvement in the supply of a range of environmental public goods.

Table 5 Result indicator targets for the area under successful management for different environmental media through axis 2 measures for the EU-27 for 2007-2013

	Area of land under successful land management (million hectares)	Proportion of land under successful land management (as % of UAA)
Biodiversity	48.4	26.5
Avoidance of marginalisation	54.6	29.9
Water quality	36.1	21.5
Soil quality	25.9	14.2
Climate change	19.7	10.8

Source: DG Agriculture and Rural Development data, 2009.

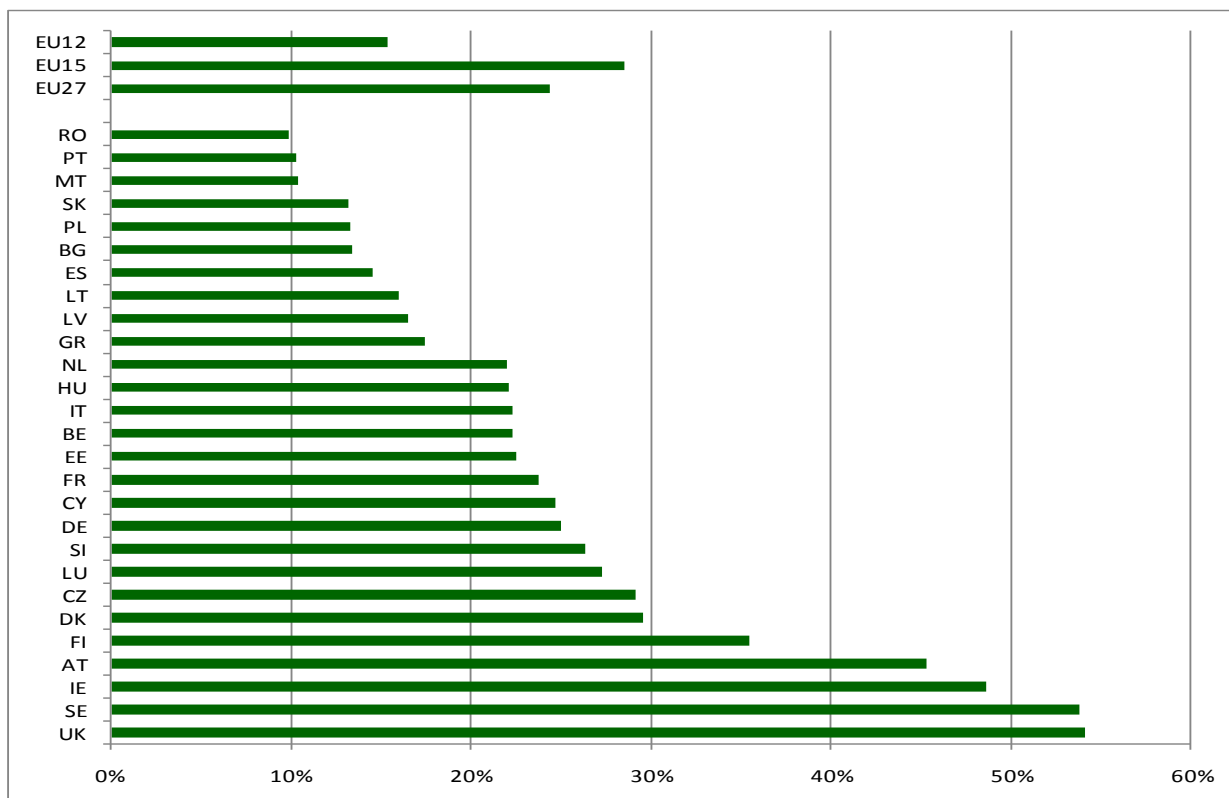
Note: These figures are likely to be an underestimate as data are missing for a few Member States.

Agri-environment measure

Of all the rural development measures, the agri-environment measure is the most directly focused on the delivery of environmental public goods. As the only compulsory measure within rural development policy, all RDPs use the agri-environment measure to encourage delivery of a wide range of public goods. Not only is it the measure with the broadest geographic coverage, it also accounts for the greatest share of total public expenditure of all measures within the EAFRD – almost a quarter of all planned expenditure for 2007-13.

Overall, programmed expenditure (including national co-financing) for the agri-environment measure accounts for 24 per cent of the total RD budget for the EU-27, with a higher proportion (29 per cent) allocated on average in the EU-15 and only 15 per cent allocated on average in the EU-12. These figures differ significantly between Member States (see Figure 3). In a few cases, it accounts for the majority of RDP funding, for example, 71 per cent of the RDP budget in the UK – England and 54 per cent in Sweden. Several other northern European Member States allocate between 30 - 50 per cent of their total rural development budget to it (for example, Ireland, Austria, and Finland). In several (but not all) southern European Member States and in most EU-12 Member States, less than 20% of the total rural development budget is allocated to this measure.

Figure 3 Proportion of total public rural development expenditure for the Agri-environment measure by Member State (214)



Source: IEEP calculations based on programmed expenditure within individual RDPs for 2007-13, including additional Health Check and EERP funds.

According to the expert led review of the RDPs, the main public goods prioritised by the agri-environment measure are farmland biodiversity, agricultural landscapes, soil functionality, reduced greenhouse gas emissions and water quality, although the actions prescribed often result in benefits for a wider range of public goods, including rural vitality. Overall, the agri-environment measure was identified as being specifically targeted at maintaining or improving the state of farmland biodiversity in the majority of RDPs, followed by agricultural landscapes and soil functionality. The other main public goods targeted in a significant number of RDPs include reductions in greenhouse gas emissions, water quality, and carbon storage. Other public goods are only specifically targeted by the agri-environment measure in a small number of RDPs, although they may benefit indirectly through the management practices carried out primarily to achieve other outcomes. For example, many of the actions to maintain or enhance landscape character or farmland biodiversity (such as the continuation of extensive grazing or the maintenance and restoration of landscape features such as hedgerows and terraces) are also likely to help improve the resilience of the area to flooding and fire events.

A wide range of land management practices/actions are supported under individual agri-environment schemes that contribute to improving the state of the environment. The most frequently supported actions, identified in the 88 RDPs reviewed, are those that support the maintenance and/or the introduction of organic farming practices, the use of local/rare breeds of livestock, the maintenance or introduction of extensive grazing practices, and the maintenance and management of natural features. Other actions that are highlighted as being used in a significant number of RDPs are those that encourage environmental management within more intensive systems, such as the establishment of buffer strips against field edges and water courses, the establishment of no spray zones within arable fields or the introduction of more extensive arable management. In addition actions such as the cultivation of traditional crop types, the management of wetland/river meadows, the maintenance and management of traditional orchards and the maintenance of built features are actions that feature in many agri-environment programmes (see Table 6). These actions reflect the majority of management practices which were identified as contributing to improving the supply of multiple public goods in Chapter 3, with organic farming and extensive arable management practices requiring the

incorporation of fallow in rotations, the use of green manure and cover crops and growing crops with lower nutrient requirements.

Agri-environment schemes included fewer actions to support the development of management plans for soils, nutrient inputs or general environmental management; the creation of wetlands, management to achieve the good ecological status of water courses and the reversion of arable to grassland.

In general, maintaining or enhancing the biodiversity or landscape value of the farmed environment is the main priority for the most frequently supported management practices under agri-environment schemes in the majority of Member States, specifically those that promote extensive grazing practices, the maintenance of landscape features or particular habitats. Maintaining and enhancing soil functionality is another priority addressed by agri-environment schemes, particularly through support provided for introducing and maintaining organic farming practices and extensive arable systems. Support for converting to organic and for maintaining organic management practices is notable in that the management practices involved are considered as contributing to the provision of the broadest range of public goods, including rural vitality. The benefits for rural vitality are likely to be due to the higher labour needs of organic farms, which provide employment opportunities in rural areas (Lobley, 2009).

Table 6 Commonly supported actions under the Agri-environment measure (214)

Supported actions according to frequency of use (by number of RDPs)	Public good focus in order of significance
Maintain organic farming practices	<ul style="list-style-type: none"> • Soil functionality • Farmland biodiversity • Water quality • Air quality • Agricultural landscapes • Rural vitality • Water availability • Climate stability – GHG emissions • Climate stability – carbon storage
Introduce organic farming practices	<ul style="list-style-type: none"> • Soil functionality • Water quality • Farmland biodiversity • Air quality • Agricultural landscapes • Rural vitality • Water availability • Climate stability – GHG emissions • Climate stability – carbon storage
Use of local/rare breeds of livestock	<ul style="list-style-type: none"> • Farmland biodiversity • Agricultural landscapes • Rural vitality
Maintain or introduce extensive grazing practices	<ul style="list-style-type: none"> • Farmland biodiversity • Agricultural landscapes • Soil functionality • Resilience to flooding and fire • Water quality • Climate stability – GHG emissions • Climate stability – carbon storage
Maintain and manage natural features	<ul style="list-style-type: none"> • Farmland biodiversity • Agricultural landscapes • Soil functionality • Water quality • Rural vitality
Cultivation of traditional/endangered crop types	<ul style="list-style-type: none"> • Farmland biodiversity • Agricultural landscapes • Soil functionality • Rural vitality
Maintain or introduce extensive arable management	<ul style="list-style-type: none"> • Soil functionality • Farmland biodiversity • Water quality

	<ul style="list-style-type: none"> • Agricultural landscapes • Climate stability – GHG emissions • Climate stability – carbon storage
Establish buffer strips/field margins against field edges	<ul style="list-style-type: none"> • Farmland biodiversity • Agricultural landscapes • Water availability • Water quality
Management of wetlands /river meadows	<ul style="list-style-type: none"> • Farmland biodiversity • Agricultural landscapes • Water quality • Water availability
Maintain and manage traditional orchards	<ul style="list-style-type: none"> • Farmland biodiversity • Agricultural landscapes • Rural vitality • Soil functionality
Maintain built features	<ul style="list-style-type: none"> • Agricultural landscapes • Farmland biodiversity • Soil functionality • Rural vitality
Establish buffer strips next to water courses	<ul style="list-style-type: none"> • Water quality • Farmland biodiversity • Agricultural landscapes • Soil functionality
Development of nutrient management plans	<ul style="list-style-type: none"> • Soil functionality • Water quality • Farmland biodiversity • Air quality • Agricultural landscapes • Climate stability – GHG emissions
Reversion of arable to grassland	<ul style="list-style-type: none"> • Farmland biodiversity • Agricultural landscapes • Soil functionality • Water quality • Climate stability – GHG emissions • Climate stability – carbon storage
Protect and maintain water courses in good ecological status	<ul style="list-style-type: none"> • Farmland biodiversity • Water quality • Agricultural landscapes • Soil functionality • Resilience to flooding and fire
Development of soil management plans	<ul style="list-style-type: none"> • Soil functionality • Agricultural landscapes • Water quality • Farmland biodiversity
Creation of wetlands	<ul style="list-style-type: none"> • Farmland biodiversity • Agricultural landscapes • Water quality • Water availability
Development of whole farm environment management plan	<ul style="list-style-type: none"> • Soil functionality • Water quality • Farmland biodiversity • Agricultural landscapes
Establish no spray zones within arable fields	<ul style="list-style-type: none"> • Soil functionality • Farmland biodiversity • Air quality • Water quality

Source: Expert screening of the 88 RDPs, 2007-2013

The significance of the agri-environment measure for supply of public goods, particularly environmental public goods is illustrated by the examples in Box 1.

Box 1 Examples of the way the agri-environment measure is used to support public goods in different Member States

Prioritising support for HNV farming systems in Bulgaria: Bulgaria is very rich in farmland biodiversity and, with Romania, has the largest contiguous area of HNV farmland in the EU, much of which is threatened by abandonment or intensification.

Bulgaria's RDP gives high priority to maintaining HNV extensive grazing systems. Specific agri-environment packages are available for the restoration and maintenance of HNV under-grazed or over-grazed grasslands. This support promotes traditional mowing methods and allows for certain livestock densities in order to conserve and maintain HNV grasslands and associated species through the continuation, or re-introduction of traditional management practices. A temporary package to protect habitats and bird populations in HNV areas has also been introduced. This will remain until equivalent statutory management requirements enter into force in designated SPAs under the Birds Directive. For example, a pilot agri-environment scheme is running in the Pirin and Central Balkan National Parks. It aims to support traditional mountain pastoralism in areas threatened by land abandonment. The scheme encourages farmers to use traditional patterns of seasonal grazing with shepherds looking after traditional local breeds in high mountain pastures in the summer months. The scheme also promotes the use of Karakachan dogs to protect the grazing livestock from wolves or bears.

Protecting the Great Bustard in Hungary: The open plains of Hungary are home to nearly 1 400 great bustard (*Otis tarda*), the world's largest flying bird. Once much more widespread, the EU population is now confined to a few Member States where its preferred habitat of open, flat landscapes, with steppic grassland, crops and bare ground is vulnerable to agricultural improvement.

For successful breeding, the birds need areas with minimal disturbance and an abundant supply of insects. The Hungarian RDP has detailed agri-environment options for the great bustard on both arable and grassland. Under these options, the use of fertilisers, herbicides and electric fences is limited, pesticides and irrigation are prohibited, harvesting must be delayed until July and areas of the crop left uncut. Cultivation of lucerne is encouraged, to provide feeding and nesting areas, and if farmers find a great bustard nest they must report the location to the conservation authorities and leave a 50m zone undisturbed around the nest.

Maintaining traditional trees and bushes in Cyprus: In Cyprus support under the agri-environment scheme encourages the maintenance of traditional trees and bushes within the agricultural landscape. These perennial crops are highly marginal economically, but they are vital elements of the traditional farmland landscape in Cyprus - a mosaic of small fields with varied crops and remnants of natural and semi-natural vegetation. The maintenance of these trees and bushes will have wildlife benefits and will also help maintain and enhance carbon stores. In the absence of the scheme, farmers would be tempted to remove such trees and bushes to make space for annual crops, or create new terraces or even to develop land for building.

The eligible species are carobs, almonds, hazel nut trees and sage, terebinth, mastic and dog rose bushes. Trees qualify for payments of 600 Euro per hectare and bushes qualify for 400 euro per hectare. Farmers have to control weeds mechanically by rotavating, rather than using chemicals, and digging around the trees and bushes twice a year (once in autumn and once in spring).

Water management in Sweden: At Höja Boställe, close to Ängelholm in the south-west of Sweden farmers Peter and Monika Hansson have constructed an artificial wetland with support from the RDP, for the purpose of promoting biodiversity and retaining nutrients that otherwise might drain off their cereal growing land.

The area of the wetland is 18.85 hectares and the surface of the water is 7.5 hectares, with a catchment area of 120 hectares. To manage the flooded meadows around the wetland Peter and Monika are grazing cattle and maintenance of the whole wetland qualifies for agri-environment support. The total cost of the project was 1 500 000 SEK (equivalent to €144 500), and of this the RDP provided 1 350 000 SEK (equivalent to €130 000).

The wetland is providing significant benefits both for wildlife and recreation. Birds especially have established very well and more than 74 species have been seen. Ten of these are endangered or vulnerable species and include the Black-necked Grebe.

Integrated Territorial Intervention in Portugal: In Portugal, the main agri-environment scheme promotes organic and integrated farming, and supports rare breeds of livestock and varieties of crop plants across the farmed landscape. More specific biodiversity measures are confined to eight zonal schemes targeted on the Natura 2000 network and the Duoro region. These measures use an innovative approach described as Integrated Territorial Intervention (ITI), which combines highly specific agri-environment and forest-environment measures with non-productive investments.

For example, the ITI in Montesinho-Nogueira offers axis 2 payments for work including: maintaining HNV grasslands and riparian tree galleries (for the benefit of otter, black stork and water pipit); growing non-irrigated grain crops in rotation with fallow (for Montagu's harrier, hen harrier and larks); protecting old chestnut tree groves (a habitat for the marten and the common redstart); and preserving or regenerating indigenous HNV woodlands and high altitude shrubs.

ITI payments are delivered through a local support structure funded by axis 3, and it is hoped that improved HNV management will lead to new opportunities for marketing local goods and services, to be promoted through the work of the axis 4 Leader Local Action Group.

Source: Issue 1 and 3 of the EU Rural Review, the Magazine from the European Network for Rural Development

Natural handicap (LFA) measures (211 and 212)

The objectives of the two natural handicap measures are to provide compensation to farmers for the natural disadvantages they face in relation to their productive capacity in terms of climate, topography, etc. within areas designated as Less Favoured Areas. The measures continue to have both a social/rural community and environmental focus, their core rationale being to support the continued use of agricultural land 'and thereby contribute to the maintenance of a viable rural community, to maintain countryside and to maintain and promote sustainable farming systems which in particular take account of environmental protection requirements' (Council Regulation EC No 1257/1999). All Member States have designated a proportion of their agricultural land as 'mountainous' or 'intermediate' LFAs and provide area payments to certain categories of farmers within these areas, determined according to nationally set eligibility criteria. These measures provide support for the continuation of predominantly extensive agricultural practices in economically more marginal areas where maintenance of the countryside is a priority, thereby securing on-going agricultural management, which acts as the basis for the provision of environmental public goods through agricultural land management.

These measures attract significant budgets in some regions, the highest being Italy - Valle d'Aosta where these measures account for 45 per cent of the RDP budget (although the figure for Italy as a whole is lower) and Finland, with 44 per cent allocated. A further six Member States have allocated between 20 and 30 per cent of total public expenditure to these measures (Austria, France, Ireland, Luxembourg, Slovakia, and Slovenia).

There are two key land management practices that are supported via the natural handicap measures – maintaining extensive grazing practices, on lowland meadows and pastures as well as mountain pastures, and maintaining extensive arable practices, both of which have been highlighted as management practices related to the supply of a range of public goods (see Section 3). The expert led review of the RDPs highlighted that, as with the agri-environment measure, the main environmental public goods targeted by natural handicap payments include agricultural landscapes and farmland biodiversity (see Table 7). By encouraging predominantly extensive management practices, however, the measures also indirectly help to maintain soil functionality and to a lesser extent water quality as well as maintaining open landscapes, thereby providing continued resilience to flooding and fire.

More than the agri-environment measure, however, rural vitality is highlighted by the experts as being an important social public good associated with the natural handicap measures, achieved through maintaining rural communities and providing opportunities for people to live and work in rural areas through encouraging the continuation of farming. Since the core objective of the LFA measure is to sustain agricultural land use, this is achieved by supporting farm incomes in those rural areas where more vulnerable communities are most likely to be concentrated. In this way the support under the natural handicap measures plays an important role in contributing to rural vitality.

A number of studies have assessed the relative contribution of LFA payments to farm incomes in EU-15 Member States in 2003 (for example Cooper *et al.*, 2006; CJC Consulting, 2003). The results of both studies paint a very diverse picture across the EU-15, with figures ranging from 1 per cent in Spain to up to 80 per cent in Finland. In 13 of the EU-15 Member States (all except Finland and Italy) the share of farm income derived from LFA compensatory allowances was higher in 'mountain' than in 'other' LFAs, strikingly so in the case of France, Austria, Portugal and Sweden, suggesting that these mountain farms are more dependent upon income from LFA payments than other LFA farms.

Table 7 Actions commonly targeted via the Natural Handicap Measures (211 and 212)

Targeted actions according to frequency (by number of RDPs)	Public good focus in order of significance
Maintain rural communities	<ul style="list-style-type: none"> • Rural vitality • Agricultural landscapes • Farmland biodiversity
Maintain extensive grazing practices	<ul style="list-style-type: none"> • Farmland biodiversity • Agricultural landscapes • Rural vitality • Soil functionality • Water quality • Resilience to flooding and fire
Maintain extensive arable practices	<ul style="list-style-type: none"> • Agricultural landscapes • Farmland biodiversity • Rural vitality • Soil functionality • Water quality

Source: Expert screening of the 88 RDPs, 2007-2013

Natura 2000 measure (213)

The agricultural Natura 2000 measure provides support to compensate for area-specific disadvantages resulting as additional costs from mandatory requirements in Natura 2000 sites established in order to 'maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest'⁴.

The choice of how Natura 2000 obligations are met is left to Member States according to the principle of subsidiarity, and can involve statutory, administrative or contractual measures. To date, programmed expenditure on the Natura 2000 measure is low in most Member States and in the EU as a whole (0.5 percent of the total, including national co-financing). The measure is used in 31 RDPs, especially in the new Member States (for example the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Slovakia) and many of the Mediterranean Member States (Portugal, Italy, Greece, Spain), although it also accounts for a small proportion of expenditure in Ireland, Belgium, Austria and Germany. In many Member States, support is provided in Natura 2000 areas for management that goes beyond mandatory requirements, and this is often delivered through the agri-environment measure.

The review highlighted the maintenance of species rich grassland and maintaining extensive grazing practices as the two most frequently supported forms of land management under this measure. In addition to farmland biodiversity, the other public goods that is also provided through such forms of management, include agricultural landscapes and to a lesser extent, soil functionality, water quality and water availability and rural vitality.

⁴ Article 2(2) of the Habitats Directive, Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, OJ L 206, 22.07.1992.

4.3.2 Capital Investments

A range of measures exist within the EAFRD that provide support for investments in capital infrastructure both on farm and in rural areas more generally that has the potential to improve the state of a range of environmental and social public goods. These measures tend to sit within Axis 1 and Axis 3 of EAFRD, and although their primary rationale is largely economic (improving the competitiveness of the agricultural sector) or social (improving the quality of life in rural areas), if designed and targeted appropriately they can also bring benefits for the environment. Support for capital investment also contributes to rural vitality, either through helping maintain the economic viability of farms or by providing opportunities for diversification, thereby driving new economic opportunities in rural areas.

Where these measures do deliver environmental outcomes, the focus tends to be on delivering improvements to water quality, soil functionality, water availability, reductions in greenhouse gas emissions rather than biodiversity and landscape.

Non-productive investment measure (216)

The non-productive investment measure (216) is used to support investment in operations such as the maintenance, restoration or establishment of hedges, fences, walls and other structures which have an environmental but little or no real productive purpose and so are unattractive economically for farmers. The measure is used extensively alongside the agri-environment measure (214) and many agri-environment scheme actions are funded through both measures.

The most common actions supported by this measure include the planting and/or management of trees, hedges and bushes, the creation and maintenance of wetlands and works associated with the conversion of arable land to permanent pasture (for example, stock fencing). The public goods that are considered to benefit the most from this measure are farmland biodiversity and agricultural landscapes, followed by carbon storage and reduced greenhouse gas emissions.

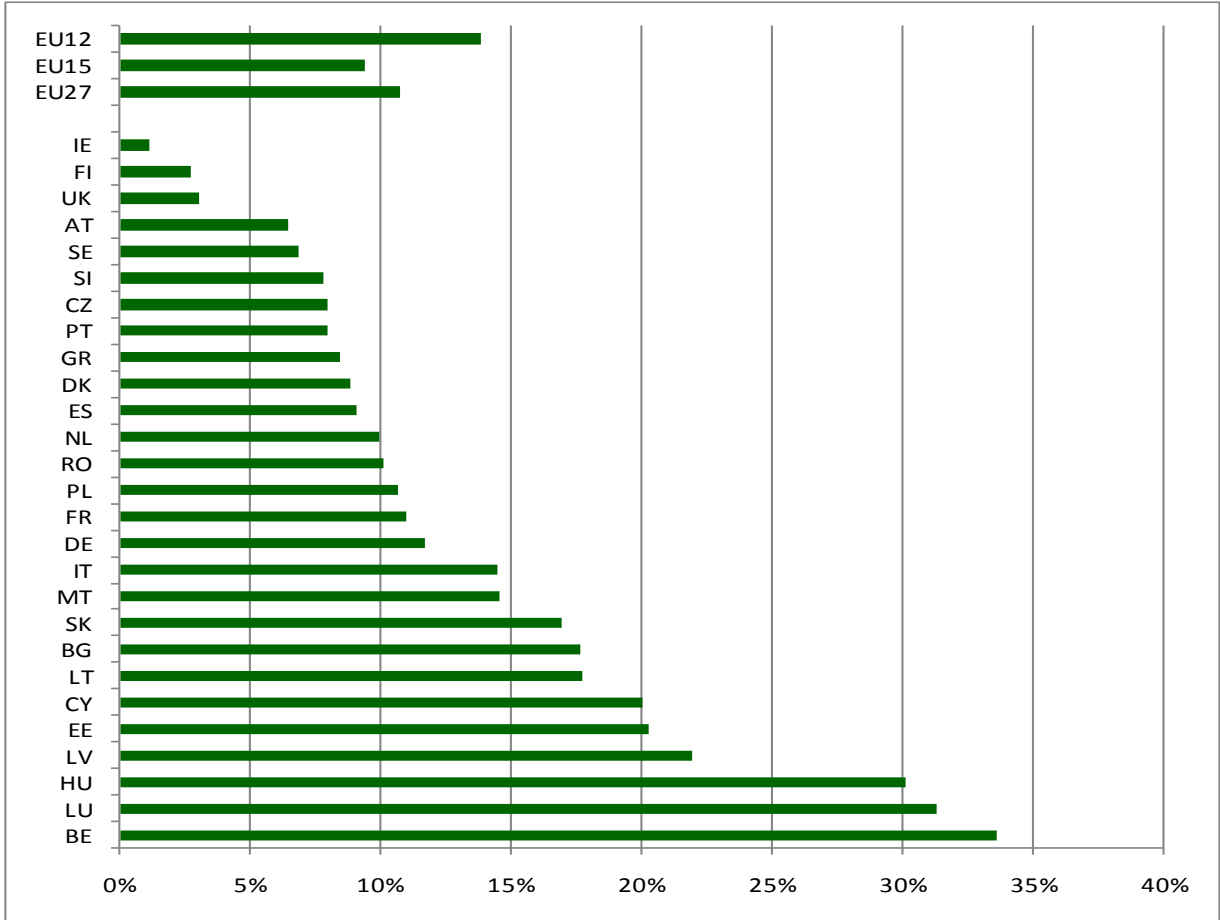
Farm modernisation measure (121)

The farm modernisation measure aims to improve the competitiveness of the farming sector by providing support for capital investments on farm for new machinery or equipment, for example, to assist with the modernisation of production techniques. While the provision of environmental and social public goods is not the primary rationale for this measure, improving the environmental status of the holding is included within its objectives, and support for some investments can provide significant environmental benefits, depending on how the measure is implemented in practice.

All but one of the 88 RDPs include this measure and the expert review suggests that at least a proportion of the expenditure is proposed to be used to support actions that aim to contribute to the provision of a wide range of environmental public goods, particularly reduced greenhouse gas emissions, water availability, soil functionality, water quality and air quality. Actual outcomes on the ground are more difficult to appraise unlike the area based land management measures under Axis 2, this measure does not tend to be focused at the delivery of benefits for farmland biodiversity or agricultural landscapes.

The farm modernisation measure attracts the third highest proportion of planned total public expenditure of all measures in the RDPs - 11 per cent in the EU-27, with the EU-12 allocating an average of 14 per cent of their RDP budget to this measure, compared to 9 per cent in the EU-15. These figures mask some significant differences in the priority given to this measure in different Member States (see Figure 4). For example nine Member States allocate over 15 per cent of their total RDP budget to the measure (Belgium, Luxembourg, Hungary, Latvia, Estonia, Cyprus, Lithuania, Bulgaria and Slovakia).

Figure 4 Proportion of total public expenditure on the farm modernisation measure by Member State (121)



Source: IEEP calculations based on programmed expenditure within individual RDPs for 2007-13, including additional Health Check and EERP funds.

The most frequently supported investment considered to deliver improvements in the state of the environment is the funding of improvements to livestock housing and handling facilities. These can help to reduce greenhouse gas emissions and improve air quality, but also allow waste to be collected and stored more efficiently. Using appropriate housing for overwintering livestock can improve grazing management, thereby reducing nitrate leaching into water courses. Such investments are also considered to benefit rural vitality, with improved facilities improving the working environment for farmers and farm labourers. Other actions that are considered to benefit public goods include improvements to equipment for manure and silage handling, processing and storage which can help reduce nitrate leaching, benefitting water quality, soil functionality, air quality and reductions in greenhouse gas emissions; the introduction of equipment and installations to support the production of renewable energy and reduced CO₂ emissions, for example through investments in anaerobic digestion facilities; and investments in improved irrigation systems to increase water use efficiency, although the extent to which this occurs in practice depends on whether or not the improvements deliver net water savings (Table 8). Several Member States support the establishment of energy crops under this measure with the aim of reducing greenhouse gas emissions and improving air quality as well as rural vitality.

Table 8 Commonly supported actions under the farm modernisation measure (121)

Supported investments according to frequency of use (by number of RDPs)	Public good focus in order of significance
Improvements to new livestock housing and/or handling facilities	<ul style="list-style-type: none"> • Rural vitality • Air quality • Water quality • Soil functionality
Investment in more efficient, environmentally sustainable technology	<ul style="list-style-type: none"> • Air quality • Water quality • Soil functionality • Water availability • Climate stability – GHG emissions
Improvements in manure handling/processing/storage equipment	<ul style="list-style-type: none"> • Water quality • Farm animal welfare • Soil functionality • Air quality • Climate stability – GHG emissions
Improved irrigation systems/technology	<ul style="list-style-type: none"> • Water availability • Water quality • Soil functionality
Establishment of energy crops	<ul style="list-style-type: none"> • Climate stability – GHG emissions • Air quality • Rural vitality

Source: Expert screening of the 88 RDPs, 2007-2013

Examples of how different Member States have used the farm modernisation measure to support improvements in the environment are included in Box 2.

Box 2: Use of the farm modernisation measure to deliver environmental benefits

Malta – Investments in environmentally sustainable technology: The abundance of small farms, which characterise Maltese agriculture, exposes farmers to inherent structural weaknesses. These are being addressed through the use of the farm modernisation measure. By granting financial support to land managers for making environmental investments, the Maltese Ministry for Resources and Rural Affairs aim to support environmentally sustainable conversion to more competitive forms of production.

Under the Rural Development Programme, farmers are eligible to receive grants for adopting environmentally sensitive technologies, operating systems and processes that provide clear environmental benefits and reduce the impact of agricultural activity on natural resources. Investments targeted towards increasing water savings or involving the use of alternative energy sources that result in energy savings are priorities. To date 360 applications have been received. Each application is subject to an environmental impact assessment, and as a result of this, 344 of these were deemed eligible. However, due to the popularity of the measure and the limited funding availability, grants were awarded to only 300 applicants.

The majority of the funding has been used to target the livestock sector where grants have been used for the installation of photovoltaic panels or wind turbines to generate renewable energy. Water savings have also been made on livestock and dairy farms through investments in small-scale water catchment facilities, harvesting rainwater from the roofs of cattle yards, which is then used for cleaning purposes. Water conservation has been achieved on a larger scale in the crop sector with grants used to construct underground water reservoirs, which collect the rainwater from the overlying land and the roofs of greenhouses. This water is then stored and used for irrigation purposes in the summer months.

France, Champagne-Ardenne, 'Plan Végétal pour l'Environnement' (PVE)

In France, the farm modernisation measure is being used to combat the environmental impact of agriculture by supporting investment in precision farming equipment. At a national level the focus of the PVE is to reduce pollution from pesticides and fertilisers; reduce soil erosion; reduce the pressure on the use of water resources; and improve energy efficiency at farm level. Investment in new equipment is intended to address these environmental issues at the same time as helping farmers gain an economic advantage in the market. The government is partly funding this programme in conjunction with local authorities and water agencies. Investments can be between €4 000 and €30 000 (up to €80 000 for cooperative farms).

Although the programme has a detailed list of eligibility requirements, some regions found that their financial resources were insufficient to cope with demand. In Champagne-Ardenne, the PVE was so successful in its first year that many applications had to be turned down. A more stringent application system has now been put in place. This prioritises investment in precision equipment for planting hedgerows as the top priority, alongside investments to reduce the use of pesticides.

Source: Issue 5 of the EU Rural Review, the Magazine from the European Network for Rural Development (forthcoming)

Infrastructure for the development and adaptation of agriculture (125)

This measure aims to improve, adapt and develop agriculture related infrastructure so as to improve the competitiveness of the sector. Its primary rationale is economic rather than environmental. However, some of the support provided can also improve the state of environmental public goods, particularly in relation to investments aiming to improve water management, storage and usage. Economic investments supported under this measure can also help to promote rural vitality.

The infrastructure measure is used in 79 RDPs in the EU-27, accounting for five per cent of total planned RDP expenditure. According to the RDP review, it is used to improve the state of a wide range of environmental and social public goods either directly or indirectly in the majority of these.

Overall, the main public goods that benefit from the support provided are water availability, water quality and rural vitality with soil functionality and reduced greenhouse gas emissions but to a lesser extent. The majority of RDPs which targeted support under this measure to improve water availability are in the Mediterranean (see Table 9).

There are three key actions that are supported under this measure which are considered to have benefits for the environment. The most commonly supported ones are concerned with improved irrigation technology and collective investments in the construction, upgrading, restoration and

modernisation of water storage and supply facilities. These types of investments principally benefit water availability, by providing opportunities to reduce agricultural water use. The measure also supports investments in more efficient, environmentally sustainable technology and this can benefit a much wider range of public goods notably air quality, water quality and soil functionality as well as reduced greenhouse gas emissions. Improvement and creation of infrastructure for the development of agriculture and forestry (which includes infrastructure for livestock to improve the grazing conditions, the construction and improvement of access roads in rural areas, and the restructuring or consolidation of land parcels) primarily benefit rural vitality by improving the accessibility and economic viability of farm holdings, as well as water availability, water quality and soil functionality, and resilience to flooding and fire.

The measure is particularly important, in financial terms, for a number of island RDPs, for example France – Reunion (35 per cent of the RDP budget), and Portugal – Madeira (31 per cent) where investment in water infrastructure is a key priority. Examples of similar operations on mainland Europe include Portugal where the measure accounts for 18 per cent of the budget and is focused on improvements to irrigation technology, and Italy – Trento where the measure accounts for 18 per cent of the budget and is targeted at collective investments for the construction, upgrading, rehabilitation and modernisation of water storage and supply. However, whether or not these actions actually result in a reduction in agricultural water use will depend on management decisions at farm level, which fall outside the scope of this review.

Table 9 Commonly supported actions under the infrastructure development measure (125)

Supported actions according to frequency of use (by number of RDPs)	Public good focus in order of significance
Improved irrigation technology	<ul style="list-style-type: none"> • Water availability • Water quality • Soil functionality
Investments in more efficient, environmentally sustainable technology	<ul style="list-style-type: none"> • Air quality • Water quality • Soil functionality • Agricultural landscapes • Farmland biodiversity • Climate stability – GHG emissions
Improvement and creation of infrastructures for the development of agriculture and forestry	<ul style="list-style-type: none"> • Rural vitality • Water availability • Water quality • Soil functionality • Resilience to flooding and fire

Source: Expert screening of the 88 RDPs, 2007-2013

Adding value to agricultural and forestry products (123)

In relation to agriculture, this measure provides support for investments in the processing and marketing of existing products, developing new products as well as developing new and innovative processes and technologies, with a focus on quality and improving environmental protection, amongst other things. It therefore has the potential to impact upon a range of environmental public goods as well as support rural vitality. The measure is used in 86 of the 88 RDPs and accounts for approximately 6 per cent of total programmed public expenditure in the EU-27. The proportion of programme expenditure allocated to this measure is highest in some Mediterranean and 10 of the new Member States (excluding Malta and Cyprus). In Spain, around 13 per cent of total public expenditure is spent on this measure.

The review of RDPs has shown that the use of the measure is particularly focused on seeking reductions in greenhouse gas emissions through investments in energy saving technologies and the processing of agricultural biomass for renewable energy. Overall, there are three particularly widely applied actions under this measure (see Table 10). The most common actions are introducing new technologies and innovation, improving environmental protection, promoting the processing of

agricultural products for renewable energy and improving hygiene and animal welfare. The main public goods supported by these actions include reductions in greenhouse gas emissions, water quality and air quality, as well as supporting rural vitality. Soil functionality and water availability are also supported, but to a lesser extent.

An example of how this measure has been used to benefit the environment is set out in Box 3.

Box 3 Example of the use of the ‘adding value to agricultural products’ measure is used to support environmental public goods

Fivemiletown Creamery, Northern Ireland

In Northern Ireland, the Fivemiletown Creamery, a small farmer-owned cooperative, making and selling a range of local cheeses, has made use of current RDP funding for introducing new technology to help solve a waste problem and improve the efficiency and profitability of their operation. The whey, a by-product of the cheese making process, was originally used as pig feed. However, by installing a reverse osmosis plant in the creamery the company has been able to increase the solid content of their whey which is then able to be sold for use in isotonic drinks. Not only is the whey now able to command a commercial value, but its environmental impact has been reduced, as it only requires a quarter of the space to transport, thereby reducing greenhouse gas emissions.

Source: Issue 5 of the EU Rural Review, the Magazine from the European Network for Rural Development (forthcoming)

Table 10 Commonly supported actions under the adding value to agricultural products measure (123)

Supported actions according to frequency of use (by number of RDPs)	Public good focus in order of significance
Introducing new technologies and innovation	<ul style="list-style-type: none"> • Rural vitality • Air quality • Water quality • Water availability • Climate stability – GHG emissions
Improving environmental protection	<ul style="list-style-type: none"> • Water quality • Air quality • Water availability • Soil functionality
Promoting the processing of agricultural products for renewable energy	<ul style="list-style-type: none"> • Climate stability – GHG emissions • Rural vitality (14) • Air quality (13)

Source: Expert screening of the 88 RDPs, 2007-2013

Semi-subsistence farming (141)

The purpose of the semi-subsistence farming measure, which can be used only by the New Member States, is to help ease the transition of the agricultural sector and rural economy to the competitive environment of the single market. It is used in eight of the 12 new Member States, but only considered to contribute to the provision of public goods within three of these – Bulgaria, Hungary and Romania. It provides support for semi-subsistence farms to enable them to improve their competitiveness and viability through restructuring into commercial holdings, increasing production and supporting diversification and is primarily seen as benefitting rural vitality, as well as landscape and biodiversity.

Conservation and upgrading of the rural heritage (323)

This conservation and upgrading of the rural heritage measure is intended to help support activities that increase the quality of life and economic attractiveness of rural areas. Although its primary rationale is social and economic, the actions that are supported focus predominantly on maintaining and improving the natural and cultural heritage of rural areas and therefore contribute to the delivery

of both environmental and social public goods. This measure is used in 69 RDPs and the review showed that its use is focused predominantly on providing support for agricultural landscapes and farmland biodiversity as well as contributing to rural vitality.

Across all RDPs, only around 2 per cent of total public expenditure is allocated to the measure, although this is much greater in Malta (22 per cent) and some EU-15 states such as Germany (7 per cent) and the Netherlands (6 per cent).

There are five actions used most frequently within the conservation and upgrading of rural heritage measure (see Table 11). These include the development of management plans for Natura 2000 sites or other areas of high nature value, with clear benefits for biodiversity; actions to maintain, restore and/or upgrade rural landscape and cultural features, which will enhance agricultural landscapes; maintaining and/or restoring traditional buildings and promoting green tourism, potentially benefitting both rural vitality and landscape; and improving environmental awareness of local actors.

Table 11 Commonly supported actions under the conservation and upgrading of rural heritage measure (323)

Supported actions according to frequency of use (by number of RDPs)	Public good focus in order of significance
Development of management plans for Natura 2000 sites and other areas of high nature value	<ul style="list-style-type: none"> • Farmland biodiversity • Agricultural landscapes • Rural vitality • Water quality
Actions to maintain, restore and/or upgrade rural landscape and cultural features	<ul style="list-style-type: none"> • Agricultural landscapes • Rural vitality • Farmland biodiversity
Improving environmental awareness of local actors	<ul style="list-style-type: none"> • Rural vitality • Agricultural landscapes • Farmland biodiversity
Maintaining and/or restoring traditional buildings	<ul style="list-style-type: none"> • Rural vitality • Agricultural landscapes
Development and promotion of green tourism	<ul style="list-style-type: none"> • Rural vitality • Agricultural landscapes • Farmland biodiversity

Source: Expert screening of the 88 RDPs, 2007-2013

Tourism activities (313)

The measure is focused on trying to stem the trend of economic and social decline in rural areas by encouraging tourism activities to boost employment and increase the attractiveness of rural areas. The measure is used in 66 RDPs. However, it only accounts for a very small amount (one per cent) of planned total public expenditure. Although it benefits mainly rural vitality, it can also provide benefits for some environmental public goods, most notably farmland biodiversity and agricultural landscapes.

The RDP review identified three widespread actions used within the tourism measure that impacted upon public goods provision. These are the provision of recreational infrastructure, for example access to rural areas; information provision/sign posting to improve visitors' and tourists' understanding of the environment; and actions to reduce the impact of tourism on the environment.

Table 12 Commonly supported actions under the Tourism Activities Measure (313)

Supported actions according to frequency of use (by number of RDPs)	Public Good focus in order of significance
Provision of recreational infrastructure (including provision of access to natural areas)	<ul style="list-style-type: none"> • Rural vitality • Agricultural landscapes • Farmland biodiversity
Information provision / sign posting to improve visitors'/tourists' understanding of the environment	<ul style="list-style-type: none"> • Rural vitality • Agricultural landscapes • Farmland biodiversity
Actions to reduce impact of tourism on the environment	<ul style="list-style-type: none"> • Rural vitality • Agricultural landscapes • Farmland biodiversity

Source: Expert screening of the 88 RDPs, 2007-2013

4.3.3 Advice, Training and Capacity Building

There are three measures under Axis 1 that provide support for advice, training and capacity building for those operating within the agricultural sector. At least one of these measures is used in all but four RDPs in the EU-27, although overall they account for only two per cent of planned total public expenditure. There is no difference in average expenditure between the EU-15 and the EU-12.

The RDP review demonstrated that the use of these measures is focused on the widest number of public goods. Support under these measures is targeted mainly on soil functionality, water quality, reduced greenhouse gas emissions, carbon storage and farmland biodiversity. The coverage of a wide range of environmental public goods through advice, training and capacity building is positive given the importance of advice and training for engendering longer term behavioural change and the need for integrated farm advice covering a range of subjects including farm business management, production, animal welfare, environment etc.

Seven key actions were identified as being prioritised within the advice and training measure for improving the state of environmental public goods. These are listed in Table 13. The most frequently applied include training on environmental management practices, general environmental advice provision and sustainable resource use and providing benefits for water quality, soil functionality and farmland biodiversity. Agricultural landscapes, farm animal welfare, water availability and the reduction of greenhouse gas emissions also feature prominently. Other actions such as advice/training on developments in environmental technology and demonstration projects are less frequently used but cover an equally broad range of public goods. The other training actions – more efficient nutrient management/input use and energy efficiency – are focused more specifically on particular public goods, such as water quality, or the reduction of greenhouse gas emissions.

Table 13 Commonly supported actions under the Advice and Training Measures (111,114, 115)

Actions	Key public goods delivered (number of RDPs with scores of 2 or 1)
Training on environmental management practices including organic management practices	<ul style="list-style-type: none"> • Soil functionality • Farmland biodiversity • Water quality • Water availability • Rural vitality • Climate stability – GHG emissions
General environmental advice provision	<ul style="list-style-type: none"> • Water quality • Soil functionality • Agricultural landscapes • Farmland biodiversity • Air quality • Water availability • Rural vitality • Resilience to flooding and fire • Climate stability – GHG emissions • Climate stability – climate storage
Training on sustainable resource use	<ul style="list-style-type: none"> • Water quality • Soil functionality • Farmland biodiversity • Agricultural landscapes • Water availability • Climate stability – GHG emissions
Advice/training on developments in environmental technology	<ul style="list-style-type: none"> • Water quality • Soil functionality • Farmland biodiversity • Agricultural landscapes • Climate stability – GHG emissions
Training focused at more efficient nutrient management / input use	<ul style="list-style-type: none"> • Water quality • Soil functionality • Climate stability – GHG emissions
Demonstration projects	<ul style="list-style-type: none"> • Farmland biodiversity • Water quality • Rural vitality • Soil functionality
Training on energy efficiency	<ul style="list-style-type: none"> • Air quality • Climate stability – GHG emissions

Source: Expert screening of the 88 RDPs, 2007-2013

4.3.4 Measures focused specifically on rural vitality

Many of the measures set out above, contribute to the provision of environmental public goods **and** rural vitality through influencing agricultural management practices. However, there is also a range of measures within EAFRD, mainly under Axis 3 and Axis 4, that are targeted towards rural vitality and capacity building in rural areas more broadly, aiming to improve the quality of life, to diversify the economy and to increase the capacity of local communities to initiate projects to meet their local needs as well as promoting cooperation and the sharing of best practice. In certain regions of the EU, these measures will play an important role in maintaining an adequate level of services in rural areas as well as, stimulating economic activity and serving to build capacity, strengthen cooperation, and enhance the skills and knowledge base of rural communities, thereby providing rural areas with the elements needed to build a robust base for the long term. Four of these measures are discussed briefly below.

Basic services for the economy and rural population (321)

This measure provides support for introducing basic services in order to improve or maintain living conditions and welfare and increasing the attractiveness of rural areas. The measure is used in about

three-quarters of RDPs, although the measure is allocated only 3 per cent of the total programmed expenditure for RDPs in the EU-27. This increases to around five per cent for the EU-12, but reaches as high as 13 per cent for Bulgaria.

The RDP review identified four main actions supported under this measure that contribute to rural vitality. The most common actions are promoting cultural and leisure activities and setting up and improving transport services, used mainly by EU-15 Member States. More focused actions receiving support include the establishment of water treatment services, as well as local community initiatives for the production of renewable energy and biomass.

Village renewal (322)

The village renewal measure focuses on investments in village communities that can help to reverse the trends of economic and social decline in rural areas, such as renovating buildings, improving local greenspace or improving IT connections. The measure therefore helps to support rural vitality for example by improving local facilities or providing employment for local trades and craftspeople. It is used in about 60 per cent of RDPs, Although the measure only accounts for an average of three per cent of total public expenditure across the EU-27, it is used to a far greater degree in the EU-12 where it account for an average of five per cent of the total RDP budget, rising to as much as 17 per cent in Romania.

There are three key actions used within the village renewal measure to support rural vitality. The most common actions supported are those focusing on the environmental upgrading of facilities; investments in local road works to improve the accessibility and usability of recreational areas or greenspace to promote cultural and leisure activities; and the renovation of buildings according to energy saving criteria.

LEADER measures (411-413)

The LEADER approach can be used to deliver outcomes under Axes 1, 2 and 3. However in the majority of RDPs it is used to deliver actions under Axis 3. The RDP screening indicates that this measure is targeted at public goods in about half of all RDPs, although it is possible that this is an under-estimate given the possibility of recording relevant actions under one of the other axes. There are no separate actions recorded under these measures.

From the RDP screening exercise, the key public good that is the focus of the actions under the LEADER measures is rural vitality, highlighted in half of all RDPs reviewed. Agricultural landscapes and farmland biodiversity are also prioritised, but to a lesser extent. One of the key strengths of the Leader approach is in the opportunities it provides for raising awareness, capacity building and strengthening cooperation between local people in rural areas to enable them to develop new skills, new ideas and implement projects that meet their local needs. These projects can be social, economic or environmental in nature, and certainly have the potential to help with the provision of public goods, however it is impossible to ascertain the extent of the measure's potential in this regard without looking at the sorts of projects that have been implemented in practice.

5. Indirect socio-economic effects of rural development intervention for the provision of environmental public goods

A range of social and economic benefits occur that depend, partly or wholly, on the existence of the public goods provided through agriculture. Environmental public goods provided through agriculture can play an important role in shaping rural areas, by enhancing biodiversity, landscape and other environmental assets, as well as underpinning important social and cultural traditions associated with land management and processing farm products. This can make rural areas more attractive as a place to live and stimulate economic activity, thereby contributing to the vitality of these areas and improving the quality of life of those who live and visit there. Beyond this, the provision of public goods by farmers impacts positively on the attitude of the public to farming, thereby increasing the legitimacy of the support provided for this purpose.

However, there is limited empirical information in the literature of these indirect effects of environmental public goods on social and economic development in rural areas. This section reviews the evidence that exists on the indirect socio-economic impacts that are generated by rural development measures, which are focused on the delivery of environmental outcomes. The main information that exists relates to the socio-economic impacts of the agri-environment and non-productive measures and that forms the focus of this section. In addition, there is relatively little evidence available at EU level, where monitoring and evaluation has generally focused on the environmental impacts of these measures. The availability of literature from Member States is also variable, with quantified information found mainly in countries such as the UK which were 'early adopters' of environmental land management payments.

5.1 Economic and employment effects

Many studies of the economic impacts of payments to farmers attempt to quantify their 'multiplier effect', which represents the number of times that an investment is spent and re-spent within a particular economy, before eventually leaving that economy. One commonly used model in the UK is LM3, which measures the income and employment impacts of the first three rounds of spending in the local economy, and estimates the magnitude of subsequent rounds. The three rounds are: the direct effect of scheme payments to the beneficiary; the indirect effects of the beneficiaries (and their contractors or suppliers) spending this money on scheme-related works; and the third round of induced effects when the beneficiaries and contractors spend their wages, salaries and profits. At each stage, some income leaks out of the local economy, and some stays within it to generate further multiplier effects. An alternative method of estimating economic multipliers is the more complex input-output model, but this is regarded as less useful for sub-regional analysis. Courtney *et al.* (2008) note that the variation in methodologies used to quantify economic impacts makes it difficult to compare results between studies. These variations are not just in methodologies but also in the number of 'rounds' of spending considered and the definitions used for 'local' economies (see for instance Box 4 and Chapter 6 in Cooper *et al.* 2009).

Box 4 Examples of the indirect socio-economic impacts that can be associated with the provision of environmental public goods

Incentives provided through rural development measures for the delivery of environmental benefits can also lead to:

- **Increased opportunities for tourism** to the local area/region in which the measure is operating, thereby providing a beneficial impact on the local economy. For example, the environmental public goods delivered provide:
 - opportunities for marketing the area on the basis of its landscape/ biodiversity etc;
 - increased opportunities for recreation;
 - opportunities for farmers to diversity into tourism related activities, for example the provision of bed and breakfast facilities, encouraging educational visits etc.
- **Changes in employment opportunities** both on and off the farm. For example:
 - On farm – changes in the number of employed or family labour for undertaking routine management or capital works;
 - On farm – changes in the number of contractors hired to carry out additional management or capital works required as a result of measures focused on the provision of environmental public goods
 - Off farm – the generation of jobs in upstream/downstream businesses
- Opportunities for **adding value to food/other products**;
- The maintenance of traditional agricultural **skills** or the development of new skills
- **Investment** being attracted to the local area, for example investment in second homes or businesses relocating to the area, which in turn provide increased employment opportunities for local people;
- **Impacts on population** levels in rural areas, for example slowing down outmigration
- Benefits for **cultural heritage**, for example where measures focused on environmental provision have also helped to maintain rural traditions, cultural events (i.e. wine/olive festivals), thereby maintaining and enhancing rural identity etc.
- An **income stabilisation** effect for those farmers in receipt of payments for the provision of public goods by virtue of the fact that incentive schemes to encourage particular land management activities provide a guaranteed income stream for carrying out certain actions over a period over 5 or 10 years.

5.1.1. Agri-environment, Natura 2000 and non-productive investment payments

Most of the studies of employment and economic benefits of RDP environmental management measures have been national studies of agri-environment payments and associated non-productive investments, or of earlier versions of these schemes which were first introduced in 1986/7 and are now in their fourth or fifth 'generation' in some parts of Europe. Some of the earlier UK studies are summarised in Table 14.

Table 14 Selected UK studies of economic impacts of environmental land management schemes (after Mills et al, 2010)

Study	Method	Duration and Scale	Sample and Data Collection	Findings
The socio-economic effects of the Countryside Stewardship scheme Harrison-Mayfield <i>et al.</i> (1998)	Input-Output modelling for income and employment; Spatial tracking. 6 case-study farms to determine local effects: Within 15km Settlements <10,000	Survey date: 1995 Period covered: 1991-1995 Comment: Activity since entering the scheme Scale: Country: England Regions: 8	Unit: CSS agreement holders Frame: Live CSS agreements Selection: Stratified by geographic area, total value and type of payment Size: 1,000 Response: 460 Data collection: Postal questionnaire; Case study interviews; Farm accounts	<ul style="list-style-type: none"> - 27% change in household income with 60% indicating a positive change - Net increase of 31 FTE farm-related jobs - A total of 479 FTEs jobs nationally, including direct and induced effect - Little change in input purchasing and output sales patterns
Evaluation of the Hedgerow Renovation Scheme ADAS (1997)	Qualitative assessment	Survey date: 1996 Period covered: 1992-1997 Comment: Activity 1 year prior to the scheme and 1 year post entry Scale: Country: Wales	Unit: Agreement holders Frame: Agreement holders with completed works Selection: Simple random Size: 100 Response: 100 Data collection: Face-to-face interviews	<ul style="list-style-type: none"> - 232% increase in hedging operation days using farm labour. - Additional jobs created on 12 holdings - Supplies and services purchased from 50 businesses, mostly small, local businesses.
Socio-Economic Evaluation of Tir Gofal Agra CEAS Consulting. (2005)	Input-Output model of the Welsh economy to consider the impact of Tir Gofal in the wider economy. Analysis of total business expenditure	Survey date: 2004 Period covered: 2000-2003 Comment: Total business expenditure over 1 year Scale: Country: Wales	Unit: Tir Gofal agreement holders Frame: Tir Gofal agreement holders Selection: Simple random Size: Not given Response: 251 Data collection: Face-to-face interviews	<ul style="list-style-type: none"> -£4.2m additional expenditure in 2003 resulted in £6.3m spend and creation of 112 FTE jobs - 73% of spend went to Welsh industries 23% to Welsh households - During 2000 to 2003 capital payments increased expenditure in Welsh economy by £21m and created 385 FTE jobs - Impact on isolated rural communities likely to be significant
Socio-economic and agricultural impacts of the Environmentally Sensitive Areas Scheme in Scotland Crabtree <i>et al.</i> (1999)	Multiplier analysis and spatial tracking. 10 ESAs for 2 spatial zones: Within ESA Within 50km of ESA	Survey date: 1998 Period covered: 1997 Comment: Activity over 1 year. Scale: Country: Scotland ESA	Unit: Farms Frame: SOAEFD database Selection: Stratified by ESA, scheme/non scheme Size: Target of 500 Response: 505 Data collection: Face-to-face interviews	<ul style="list-style-type: none"> - Over one year agreement holder household incomes increased by an average of £3,359 - Local income multipliers for ESAs ranged from 1.37 to 1.54 and creation of off-farm jobs ranged from 19 to 110 FTEs. - In 1997 payments generated 500 FTE jobs, 67% from impact on farm incomes and 33% from conservation activities.
The financial, social and management effects of Countryside Stewardship Cirl Bunting agreements on South Devon farms Hewitt and Robins (2001)	General measurement of farm inputs and outputs	Survey date: 1999-2000 Period covered: 1992-1999 Comment: Activity since entering the scheme Scale: Sub-county: South Devon	Unit: Agreement holders Frame: Agreement holder with Cirl Bunting option Selection: Census Size: 63 Response: 53 Data collection: Face- to-face interviews	<ul style="list-style-type: none"> - 89% of agreement holders reported a positive effect on profitability - Average value of capital payments was £1,500 - 3 on-farm FTE jobs had been created. - Positive effect on the use of contractors was reported but not quantified.

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Study	Method	Duration and Scale	Sample and Data Collection	Findings
Measuring the social and economic impacts of Lake District ESA grants for the repair of traditional farm buildings <i>Edwards et al. (2005)</i>	Adapted LM3 model for 3 spatial zones: Within the ESA boundary Within the wider area Elsewhere	Survey date: 2005 Period covered: 1998-2004 Comment: Completed conservation plans 1998-2004 Scale: Five study areas were identified within the Lake District ESA	Unit: ESA agreement holders Frame: ESA agreement holders with completed conservation plans Selection: Stratified by geographic area, grant value and number of traditional buildings renovated Size: 44 Response: 42 Data collection: Face-to-face interviews; Conservation plan file analysis	<ul style="list-style-type: none"> - Between 1998-2004 scheme resulted in a minimum direct injection of £3.41m to the local economy - Scheme generated between £8.5m and £13.1m for the local economy, with minimum multiplier of 2.49 - 30 contractors had worked on grant-funded building restoration projects. - Nature of contracting businesses meant most indirect and induced expenditure remained in the local economy. - Viability of contracting businesses increased, with 8 out of 9 contractors citing an increase in turnover of at least 16%. - Scheme had created between 25 and 30 FTE jobs in the local economy.
A socio-economic study of grant-funded traditional drystone wall and farm building restoration in the Yorkshire Dales National Park <i>Courtney et al. (2007)</i>	Adapted LM3 model for 3 spatial zones: Within the National Park Within the wider area Elsewhere	Survey date: 2006 Period covered: 1998-2004 Comment: Completed projects 1998-2004 Scale: Yorkshire Dales National Park	Unit: Scheme agreement holders Frame: Agreement holders with completed works Selection: Stratified by scheme and value Size: 60 Response: 53 Data collection: Face- to face interviews; File analysis	<ul style="list-style-type: none"> - Between 1998-2004 building schemes generated between £4.27m and £4.74m for the local economy. - Walling schemes generated between £2.81m and £4.38m for the local economy. - Income multiplier for building schemes was 1.65 and for the walling schemes was 1.92. - Income effects accrued on the wider area for all buildings schemes were between £6.42m and £7.10m and for walling schemes were between £3.46m and £5.41m. - 74 FTE jobs were created in the National Park and its wider local area, 41 FTE jobs by building schemes and up to 33 FTE jobs through walling schemes.
Estimating the potential economic impact of implementing the UK Biodiversity Action Plan (BAP) for species rich hedgerows in Devon <i>Mills et al. (2000)</i>	Multiplier analysis	Survey date: 2000 Period covered: 2000-2005 Comment: 5 year period Scale: County of Devon	Unit: Hedge contractors Frame: Compiled list from various sources Selection: Stratified by protected area Size: 40 Response: 30 Data collection: Telephone interviews; Key informant interviews	<ul style="list-style-type: none"> - A hypothetical injection of £1m per year for 5 years for hedge restoration work would generate 2.17m for the Devon economy. - The employment impact would be 27 FTE jobs or 32 FTE jobs once indirect and induced impacts were taken into account and the employment multiplier was 1.2. - Most jobs would go to local contractors who work within a small radius
Measuring the local economic connectivity of organic and non-organic farms <i>Lobley and Reed (2005)</i>	Measurement of farm level sales and purchases by value and proportion within 5 spatial zones: Within 10 miles; Within rest of county; Within rest of region; Elsewhere in UK; Beyond UK	Survey date: 2004 Period covered: 2003-2004 Comment: Sales and purchases over 1 year Scale: Three study areas were defined by the study for comparative purposes: Devon, Northern region and Eastern region	Unit: agricultural holdings Frame: Defra annual census Selection: Stratified by geographic area and farm type Size: 1,684 Response: 462 Data collection: Postal questionnaire	<ul style="list-style-type: none"> - Organic farms generated a higher sales value when expressed on a per hectare basis than non-organic farms. - There was little difference between organic and non-organic farm businesses in the economic connectivity with the local area.

A recent study by Mills et al (2010) of the two-tier Environmental Stewardship (ES) agri-environment scheme in England confirms for the first time at a national scale that the spill-over effects of Environmental Stewardship have a significant impact on the local economy, with 80 percent of Environmental Stewardship expenditure by beneficiaries occurring locally (within 40 minutes drive time), and 45 percent of the purchases made by contractors, suppliers and advisors also sourced locally. At a national level the 'scheme' multiplier for all Environmental Stewardship schemes is 0.26, thus for every £1 of Environmental Stewardship payment to the beneficiary, £0.26 is generated off-farm in the local economy through direct expenditure and indirect and induced effects. Applying this multiplier to the 2009 total Environmental Stewardship payments of £249 million reveals that a total of £64.7 million was generated in the local economy as a result of Environmental Stewardship activities. The income multiplier for higher tier contracts is 2.23, compared to 1.29 for entry-level contracts, largely because the higher tier contains non-productive investment options which require greater local expenditure. There is only a relatively small leakage of Environmental Stewardship expenditure out of the local economy, which the authors suggest could be reduced still further by encouraging the use of local provenance materials, such as timber, seeds and tree root stocks. The research also found that in the absence of Environmental Stewardship scheme payments a large proportion of the work would not have been undertaken, particularly for higher tier elements where 79% of Environmental Stewardship activities would not have taken place in the absence of the scheme.

The direct, indirect and induced employment effects of Environmental Stewardship schemes have created around 665 new full-time equivalent (FTE) jobs in the local economy over the study period (2005-2009). Of these, 530 FTE jobs have been generated through direct employment of farm workers, contractors or advisors as a result of the increased workload generated by the Environmental Stewardship schemes. As with income, the higher tier scheme generated the largest employment multiplier, of 2.48 with 2.21 FTE jobs created for each £1m scheme injection. This reflects the more demanding nature of the higher tier schemes and the greater requirement for the use of contractors and supplies, compared to the entry tier of Environmental Stewardship. Although the entry tier has a low employment multiplier and is less efficient at generating jobs, it nevertheless has the largest aggregate employment impact nationally, generating 478.9 FTE jobs of which 413.9 FTE jobs are generated directly as a result of its prolific uptake at 5.2 million hectares compared to 0.4 million hectares for the higher tier in 2009. On average over the sample, only 0.015 additional FTE jobs were created in the local economy per Environmental Stewardship contract holder, which suggests farms were able to absorb much of the additional workload generated by the scheme without recruiting additional staff. This implies that farm staff on these agreement holding were underemployed, and in some areas where farm underemployment is widespread, Environmental Stewardship appears to have an important role in retaining family members and farm employees on the farm. These findings reflect those of comparable earlier studies in England, for example of schemes in National Parks for the restoration of stone walls and repair of farm buildings, where the scheme payments are largely for labour intensive non-productive investments, and which also tend to have relatively large 'scheme' income and employment multipliers (Edwards *et al* 2005; Courtney *et al.*, 2007a).

Multiplying the benefits of higher tier agri-environment payments in England

This higher tier Environmental Stewardship contract is on a very large, remote LFA livestock farm of more than 1,400 ha in the North West of England, rented from a water company with a strong interest in high quality catchment management. The farm is a family unit entirely dependent on agricultural income, but uses casual and contract labour at peak times.

The farmer chose Environmental Stewardship options for dry-stone walls, hedgerows, woodland restoration, in-field trees, traditional farm buildings and the management of archaeological features on grassland. An important feature of the contract is the maintenance and restoration of parts of the farm's rough grazing and moorland, including the seasonal removal of livestock and the reseeding of depleted moorland habitat. He has had to make major changes to his farming system to comply with the agri-environment requirements. Sheep numbers were reduced to relieve grazing pressure on the moorland but managing the sheep is now more complicated because they have to be moved around the farm more, and some are in-wintered and lambing indoors, instead of staying out all year. The farmer says he has adapted well to the new system, with the support of his landlord and agri-environment project officers – but that he would not have made these changes without the agri-environment scheme.

For every £1 of scheme payment, £3.70 ends up in local economy, reflecting the use of a local contractor. This farm provides a good illustration of the growing market for habitat restoration work. In marked contrast to traditional skills such as dry-stone walling and hedge laying, restoring moorland habitats can involve a series of technically challenging operations in remote areas which are difficult to access without specialist equipment. This is frequently beyond the capability of farmers to carry out themselves. A follow-up interview with the contractor revealed that existence of higher tier options involving capital expenditure had helped the business to develop expertise in habitat restoration and resource protection techniques. The company has created at least 10 new jobs in the local area as a result of the Environmental Stewardship schemes (Mills et al, 2010).

In Wales, the agri-environment scheme, Tir Gofal, has been shown to result in increased labour requirements per farm, amounting to 66 additional person-days per farm per year, on average, of which 55.4 additional person-days are attributed to labour required for capital works. Contractors carried out almost half of the extra work generated, with 42 per cent done by the farmer and their family. Incorporating indirect effects, the impact of the £11.29 million paid to farmers under Tir Gofal on the local economy amounted to £6.3 million in 2003, associated with approximately 112 FTE jobs. 73% of the spend went to Welsh industries and 23% to Welsh households, and is likely to have had a significant impact on isolated rural communities. The impact on the Welsh economy over four years was estimated to be over £21 million, supporting some 385 FTE jobs (Agra Ceas Consulting, 2005). An earlier survey of 32 farms in Scotland participating in the Environmentally Sensitive Areas ESA scheme found that 80% of positive total employment effects were in the contract labour sector, providing services such as wall building, hedge laying and stock fencing, and 18% of additional labour was created on-farm. The agri-environmental schemes had a small positive impact upon the use of advisory services (2% of total) but this might have displaced other farm advisory work. The study concluded that agri-environmental schemes were at least helping to reduce employment fall-offs in rural areas, even if the gains were not significant (Scottish Agricultural College, 2002).

Employment and landscape benefits of traditional viticulture in the Aegean

Farmers in the Greek islands of Santorini (Thira) and Thirasia traditionally pruned their vines in a very special way to protect the grapes from the wind. The variety of grape 'Assyrtiko' is well adapted to the dry hot summers, strong winds and volcanic soils and pruning the plants in a circular reverse conical shape has created a distinctive landscape. Skilled labour is needed for this work and mechanisation is impossible. The vineyards and the landscape they create are threatened by urbanisation and tourist development, and by a move towards high linear vine growing, which would reduce farmers' costs.

When a €1.5m agri-environment scheme for landscape protection on the two islands was introduced, compensating farmers for the extra costs and decreased productivity of their special pruning system, and for maintaining terraces, bushes and trees at the field margins, almost half of the vineyards joined in the first two years. Together with special aid for small islands of the Aegean the payments of €1525 per hectare make it possible for the farmers to continue using labour intensive techniques, in order to keep the quality of wine cultivation alive, providing both local employment and a distinctive landscape for visitors.

The Natura 2000 measures for farmers and foresters have so far been little used, partly because some Member States have chosen to use targeted agri-environment and non-productive investments to incentivise environmental management within these areas. It has been suggested that the existence of a Natura 2000 site, particularly one that requires substantial management, can provide broad socio-economic benefits for a number of local and regional actors, including payments to farmers and jobs in sectors or activities related to the site such as processing natural produce, traditional crafts and tourism. Rural development support for Natura 2000 sites may in turn lead to wider benefits for the local community, strengthening farm income, thereby reducing the risk of land abandonment.

5.1.2. Wider economic and employment effects of environmental land management

In addition to the direct and indirect economic and employment effects of agri-environment payments on the local economy described above the very presence of attractive agricultural landscapes, farmland biodiversity and historical features can provide economic opportunities for a variety of economic activities including rural tourism and recreation, speciality products and foods, as well as attractive locations for the establishment of businesses. Furthermore, the products of certain environmentally sustainable farming systems have the potential to be differentiated on the basis of their association with particular production methods or settings, and thereby to attract a premium price.

In the Czech Republic, a study comparing intensive and extensive systems found that the farms providing agri-tourism were mostly situated in regions with extensive agricultural systems (Grega et al., 2003). A study conducted in central France indicated that landscape diversity attracted visitors and provided a basis for green tourism (Fromageot et al., 2007), supported by similar findings in the Netherlands, (Vanslebrouck and Van Huylenbroeck, 2003). In the Italian Alps, a study explored the links between tourism and the mountain pastures, with the alpine landscape in the regions of Valle d'Aosta, Piemonte, Lombardia, Friuli Venezia Giulia, Veneto, Trentino Alto Adige inspiring a number of tourism initiatives (Corti, 2004). In Italy, eco-tourism in the Friuli Venezia Giulia and Veneto regions has played a significant role in economic development, contributing to the on-going rural vitality of agriculturally marginal areas and providing recreational and cultural benefits to the inhabitants of highly populated areas on the Veneto and Friuli plain (Tempesta et al., 2002). In Germany, the popularity of landscapes of high biodiversity value as tourist destinations has enabled the Rhönschaf – a rare breed of sheep from the Rhön area – to be brought back from the brink of extinction. This breed has become a tourist and culinary trademark of the Rhön as well as enhancing local cultural identity and as a result, sheep numbers have increased significantly (Nyenhuis et al., 2007). In the UK, the foot and mouth outbreak in 2001 illustrated the importance of tourism to the rural economy, but the exact nature of the

relationship is not well understood, although it is clear that the continuation of tourism activity appears to be fundamental to the future sustainability, in particular of many parts of LFA. Other activities, such as grouse shooting, fishing, horse riding and livery and on-farm food processing and retailing can be economically significant for rural areas, but are often not dependent on farming activity (Swales et al., 2004).

Although RDP support for environmental management may also help to maintain the natural resources on which these activities depend, the farmers doing the work may not necessarily share the economic benefits. A study in the Haute-Vienne in France (Vollet and Guérin, 2005) analysed the financial flows in terms of job creation and expenditure on materials and services arising from the maintenance and creation of the landscape in the "Pays des 117 Météorites". It calculated the money spent, the jobs created directly and the financial returns to other businesses from using the landscape. The study found that farmers contributed 57 per cent (about €750,000) of the total money spent to maintain the landscape. In spite of this significant contribution, farmers did not receive any financial returns from the subsequent use of the landscape and all of the 25 jobs created were in the service sector.

Economic benefits of managing farmland resources for shooting and fishing in the UK

Wild geese on farmland

Several agri-environment schemes in the UK compensate farmers for damage caused to grazing land and crops by over-wintering wild geese. Although the payments have little or no effect on direct or indirect farm employment, the presence of the geese can attract visitors. Research in Scotland in 1998 estimated that bird watchers and goose shooters spent a total of £5.4 million per year in local economies around Scottish goose sites, providing an injection of spending into the Scottish economy. Of this total approximately £3.6 million can be attributed to the presence of the geese, and supports more than 100 FTE jobs in local economies, 53% by inland goose shooting, 42% by goose watching and 5% by coastal wildfowling (RSPB and BASC, 2008).

Grouse moors and sheep grazing

Grouse shooting is big business in the North York Moors National Park, covers most of the heather (*Calluna vulgaris*) moorland area, supports the employment of large numbers of people and generates contract work, often done by local farmers. According to a local gamekeeper, interviewed in 2003, there were around 40 full-time gamekeepers working on grouse moors in the Park, and grouse shooting also employed significant numbers of casual workers – one estate with 2,800 hectares provides casual work equivalent to two full-time jobs, working as beaters (driving the birds towards the guns), bracken spraying, heather burning, gritting and on road repairs.

There are mixed opinions as to the importance of sheep grazing in managing grouse moors – most believe that sheep are important to control heather overgrowth, encourage growth of young heather shoots and prevent scrub regeneration. An alternative view is that this can be achieved through burning, with some scrub clearance when necessary, which is the practice on one moor. It is clear that grouse are more important on the moors in economic terms than sheep grazing, and a party may pay £10 000 for a day's shooting. The grouse moor estates operate in a high value international market, where their main competitors may be dove shoots in South America, some African shoots and duck shoots in India (Swales et al 2004).

Few attempts have been made to quantify the economic or employment impacts of these effects and the studies which exist are not specifically linked to support through RDP measures. In England a National Trust study (1999, reported in Winter and Rushbrook, 2003) estimated that 3.7 million (79 per cent) of all annual holiday trips to Devon were motivated by the 'conserved landscape', defined as fields, wood, moorland, villages and coastline. These trips were estimated to generate a visitor spend of £749 million, and support a total of 23,900 full time equivalent jobs, of which 16,000 are supported directly by landscape motivated holiday trips. The Countryside Agency (2002) estimated that rural tourism in the English countryside is worth nearly £14 billion a year and supports 380,000 jobs.

5.2 Social effects – improving social and human capital

5.2.1. Agri-environment and non-productive investment measures

Agri-environment schemes have been shown to have a positive impact on increasing human capital and on social capital. A literature review by Mills et al (2010) quoted evidence that agri-environment schemes have contributed positively to the management skills base of farmers, increasing their environmental knowledge, learning and awareness. An appreciation of the environmental benefits of agri-environment management can, in some cases, encourage a positive attitudinal shift, although there is less evidence of this when farmers join schemes for financial or opportunistic reasons. Similarly, farmers gain little new environmental knowledge where scheme participation merely facilitates a continuation of already established farming practices. It has also been suggested that farmers do not benefit from new skills or knowledge where agri-environment management prescriptions have been imposed and conflict with the farmers' own traditional local knowledge, and it could be argued that such imposed management can lead to the erosion of traditional knowledge.

In the context of environmental land management, social capital refers to the links between: farmers and farmers (bonding social capital); farmers and society, particularly the local community (bridging social capital) and; farmers and institutions (linking social capital). Studies of agri-environment schemes have tended to examine how social capital can lead to scheme uptake, rather than looking at enhanced social capital as an outcome of agri-environment participation, in the form of the knowledge, skills and institutions. There is most evidence for this from studies of agri-environmental co-operatives (for example in the Netherlands), which are thought to contribute to social cohesion by linking people to achieve common objectives, and networking. Arguably, when agri-environment scheme participants are linked to Project Officers, newsletters, training and farm visits, they have greater access to resources than non-participants, which is one measure of social capital. Participants in some conservation initiatives have been found to develop good linking social capital, and a number of researchers have pointed to the propensity of organic farmers to cluster together, sharing practical, marketing and social knowledge.

The same study, which interviewed a sample of 360 beneficiaries of the England Environmental Stewardship scheme and 85 local businesses, found that participation had increased farmers' environmental knowledge, skills, and general awareness of the environment when managing the farm, especially for participants in the higher tier scheme who had to make changes to their established management practices. Environmental Stewardship has had a greater positive impact in terms of skills and knowledge development on arable farmers, possibly reflecting their need to do more than the usual arable farming practices.

44 per cent of (mainly higher tier) participants felt that there was transferability of skills from Environmental Stewardship schemes to other tasks around the farm, particularly to field operations, such as cultivation of field edges, spraying and chemical usage, drilling and their timing. Around a third of the sampled higher tier agreement holders had attended training courses or open days to learn practical skills, such as hedge laying, drystone walling and management skills for specific habitats. Some contractors and advisors also sought new knowledge and skills through training courses.

Environmental Stewardship can play an important part in developing new social contacts and networks. Of the advisors used by agreement holders, 40% were not known to them previously, particularly for higher tier participants and for the lowland dairy and livestock farms, bringing a new range of actors into the circle of advice and influence over the management of the land. The advisory not-for-profit organisations also saw the schemes as a useful mechanism for reaching farmers with whom they had previously had no contact. It appears that in a period of increased isolation, the social contact prompted by scheme membership (hosting or attending farm walks, meetings to discuss options, advisor visits) is greatly valued.

Employment and social benefits of agri-environment schemes in Poland

Beka Nature Reserve

The Beka Nature Reserve, a coastal Natura 2000 site important for birds and wet grassland and sedge habitats has benefited since 2005 from a 100 hectares agri-environment contract, covering half the reserve and supporting organic farming on permanent grassland, and specialised habitat management. To meet the requirements of the scheme the reserve employs a full-time manager plus a shepherd during the May – October grazing season. Local businesses benefit too, including the farmers who save veterinary and feed costs for the 60-70 cattle and horses they lend to graze the reserve during summer. Local contractors mow grass in summer and reeds in winter, and maintain stock enclosures. The reserve is used to train agricultural advisers, acts as an informal advisory point for local farmers and co-operates closely with 4-6 local schools. It has become an additional tourist attraction in the commune, a bike path along the coast will be constructed in 2010 and a new educational path is planned.

Black Sheep – condemned to nature protection

This innovative 2007-08 project in Lower Silesia combined social rehabilitation with farming and nature conservation, involving convicts from Wolow Penitentiary, prison officers and farmers from the Barycz Valley. The aim was to prepare convicts for employment after their release and included training in agri-environment management, using agri-environment funding for rare breeds as part of the funding for a training programme. A total of 650 convicts learnt about the independent breeding of Wrzosówka sheep, working in an agricultural holding the principles of animal welfare and basic sanitary procedures important for keeping a herd in good condition.

6. Towards success criteria for the successful delivery of public goods

The analysis indicates that a wide range of measures have the potential to encourage the provision of both environmental and social public goods through agriculture. Whether or not they do so in practice depends on a number of factors and indeed evaluations of the impacts of the past and current Rural Development Programmes indicate that the environmental outcomes vary to a significant degree (see, for example, Birdlife, 2009).

There are a wide range of factors that contribute to the successful delivery of public goods. Some are operational and relate to the design of the programme and the complementarity of measures in securing a range of objectives in response to local needs. The design and targeting of measures, along with the adequacy of the budgetary resources allocated to them, also exerts a significant influence on the eventual outcome, and whether the potential of a measure to secure the delivery of public goods is realised in practice. With respect to the implementation of programmes and schemes, the degree of administrative and technical capacity within national administrations, extension services, research bodies, paying agencies, along with the provision level of advice and training for farmers also has a significant effect on public goods outcomes. Effective monitoring and evaluation are critical to assess outcomes and to inform improvements in both measure and scheme design. Appropriate engagement with farming organisations can help to establish well designed programmes and to elicit a sense of co-operative effort. Finally, the successful delivery of public goods can be reinforced and enhanced if there are tangible effects on the local economy and vitality of rural areas, resulting from the provision of public goods such as cultural landscapes and biodiversity.

All of these factors are discussed in more detail below, drawing on information collected from the Member State survey in which respondents from selected Member States were asked to assess the level of institutional capacity with respect to the delivery of selected measures⁵,

⁵ Specifically, information on the delivery of four measures was collected – the agri-environment measure, natural handicap payments, Natura 2000, and farm modernisation. The data collected are summarised in a series of tables set out in Annex 1.

the provision of advice and training, and the degree of interaction between environmental and farming organisations in the delivery of measures supporting the provision of public goods. In addition, a range of previous studies on rural development policy have been drawn upon (see, for example, Dwyer *et al.*, 2008) to derive a series of guiding principles which are important for the successful delivery of public goods through RDPs.

6.1 The design and specification of programmes and measures

Although the analysis in Chapter 4 indicates that there is a large proportion of measures within all four Axes of Rural Development policy with the potential to deliver public goods, at present there is only a small number of measures which have environmental objectives. The successful delivery of public goods depends on all of those measures with a potentially beneficial impact having objectives which are explicit in this regard. Indeed, studies indicate that the proper and consistent design of a measure is crucial for effective implementation and the achievement of stated objectives.

Measure objectives need to be sufficiently precise so as to allow a process of monitoring and evaluation thereby allowing judgements to be made about whether they are contributing to the outcomes being pursued. One advantage of the programming approach in Pillar 2 of the CAP is that such objectives for Rural Development programmes can be presented and scrutinised at Community level so that there is transparency whilst allowing for differences in priority between Member States and regions. Since the pursuit of public goods in an efficient and effective way raises more difficult issues than some traditional CAP objectives, the need for regular review and adjustment to changing circumstances is particularly apparent.

6.2 Targeting of measures

Efforts to target policies precisely on specific public good outcomes are important and are critical to successful delivery. Targeting can be pursued at different levels. It may be thematic, based on issues of greatest priority, or geographical, based on individual farm characteristics, or a mixture of the above. Taking an integrated approach, recognising the synergies and potential conflicts between achieving different objectives, is critical to effective targeting. This is important in determining the actions that should be targeted within each rural development measure, as well as to ensure that measures within RDPs as a whole, and between RDPs and other national and regional programmes (for example under the Structural Funds) are operating synergistically. Only this sort of integrated approach can assure that environmental, social and economic benefits are maximised and any risk of conflicts between different public goods minimised.

Some measures deliberately target a range of objectives, however in the case of more general support measures intended to secure the viability of farming systems that are broadly sustainable in environmental terms, the targeting needs to be sufficiently simple to operate so as to avoid the detailed farm by farm and field by field appraisals that may be required for more contractually based agri-environment payments. For example, measures aimed at supporting certain categories of extensive livestock production could be based on a relatively small number of verifiable criteria such as average stocking densities. Where the goals are more specific, such as reductions in soil erosion, measures will need to be targeted more precisely, for example, to those soils at risk, to those practices most likely to reduce erosion, to those areas with a particularly critical issue and even to those farmers for whom there appears little private benefit to be derived from addressing the problem. Some of the more targeted and demanding 'upper tier' agri-environment schemes have relatively low levels of take up, which draws attention to the link between adequate levels of payment and more ambitious measures.

It should be recognised that precision in targeting may be difficult in some cases and can carry relatively high costs in terms of data requirements, administrative effort, increased transaction costs for farmers and may risk intruding on farmers' sense of independence and professional competence by excessive bureaucratic guidance. Nonetheless, appropriate

targeting, which leaves sufficient discretion to the judgement of farmers and those applying policy on the ground, is essential to secure specific outcomes.

6.3 Synergies and conflicts between and within measures

Both synergies and tensions arise in relation to the supply of different individual public goods. In many cases, management practices and investments in new technologies and infrastructure can deliver multiple public goods at the same time. However, in some cases there will be trade-offs necessary between the provision of different public goods. For example, actions to reduce the net emissions of GHG per kilogramme of food production generally imply high yields per hectare, short production cycles and optimised use of technology, animal and crop genetics, which are not necessarily compatible with the provision of high levels of biodiversity. Such synergies need to be maximised wherever possible, and where conflicts may occur, these need to be identified and a decision made about the trade-offs that will be necessary if an appropriate balance of different objectives is to be achieved. These issues should be addressed during the development phase of the RDPs and reviewed regularly, particularly as a result of the mid-term and ex post evaluations.

A number of conflicts were identified within the RDPs, where actions under a particular measure to prioritise one environmental objective have the potential to adversely affect another. For example, under the farm modernisation measure, improvements to new livestock housing, waste handling facilities and irrigation systems/technologies were identified as having the potential to have negative impacts on agricultural landscapes, soil functionality and farmland biodiversity at the same time as improving water quality and encouraging the more sustainable use of water resources. Detrimental impacts on agricultural landscapes and biodiversity were also associated with the establishment of energy crops in certain RDPs. Under the infrastructure measure, actions, particularly those that involved the introduction of new infrastructure, such as access roads and land consolidation, which can be beneficial for rural vitality were seen as having the potential to conflict with the provision of other public goods such as agricultural landscapes, farmland biodiversity and, in some cases, soil functionality. A third example relates to the tourism measure, where experts identified support for the provision of recreational infrastructure such as access roads and paths, and an increase in built development, as having an adverse impact on farmland biodiversity, agricultural landscapes and soil functionality, largely relating to the increased traffic generated and inappropriate development. Specific examples of these impacts were identified in five Member States including Bulgaria, Slovakia, Romania, France, and Germany but are likely to arise elsewhere as well.

There are also opportunities to use measures in combination to encourage the range of actions that are needed to ensure the supply of environmental public goods. Synergies can be exploited by using packages of measures to encourage the provision of public goods alongside increasing the competitiveness of the farm business and encouraging rural vitality. For example the agri-environment measure could be used in conjunction with the farm diversification measure in Axis 3 and the adding value to quality products measure in Axis 1. Initiatives could be designed to provide an attractive landscape, species rich habitats and high quality water, contributing to appropriate conditions for the production of high quality products are produced, marketed and sold, at the same time as providing an ideal location for tourism activities, through promoting increased recreation opportunities and/or the provision of on farm accommodation. However, very few examples of how different Member States intended to use their measures in a synergistic way were identified through the RDP screening or the Member State survey. More consideration of how to maximise the use of measures in this way would be beneficial leading into the next programming period.

However, as identified in Chapter 4, not all measures are focused on the supply of environmental and social public goods. Where other objectives, such as increasing competitiveness and the physical capital of the sector, predominate, these categories of public goods will not necessarily be supplied, and in some cases their undersupply may worsen. This can be the case if the actions that are encouraged lead to further environmental

degradation, for example. To avoid this happening, appropriate conditions and safeguards need to be put in place and effectively enforced.

6.4 Effective implementation

The way in which measures are designed, presented and implemented at the local level exerts a significant influence on their effectiveness in achieving the delivery of public goods. For the most part, rural development measures are delivered at the individual holding scale. However, many of the issues that need to be tackled in order to target effectively the provision of public goods require a landscape scale response, and one that involves multiple farm holdings within a coherent geographic area. Such approaches will become increasingly important to tackle the challenges of climate change, including enhancing the ecological integrity of rural areas, increasing the resilience of agricultural land to fire and flooding, as well as tackling issues such as maintaining high Nature Value Farming systems, and improving water quality, particularly through tackling diffuse pollution.

In addition, the use of a range of policy measures in synergy can help to achieve more effective results, for example by combining agri-environment measures with support for farm diversification and the development of added-value products. However this not only requires a coordinated approach to scheme design, but also to their delivery, including scheme administration, supporting measures and advice. This can present challenges to institutional capacity in some Member States.

6.5 Measure delivery

Increasing efficiency and effectiveness in implementing Rural Development measures can be achieved by refining or improving delivery mechanisms over time. The results from the Member State survey indicate that overall there is not a great deal of difference in the approach taken to deliver the four measures that were the focus of the analysis (the agri-environment measure, natural handicap payments, Natura 2000, and farm modernisation) within each country. In most cases, the same organisations are involved in the delivery of all four measures, and in most countries delivery is at a national level with some involvement from regional bodies and NGOs. The typical pattern is delivery at national level with a Ministry of Agriculture and/or paying agency with overall responsibility.

Agri-Environment, Natura 2000 and Natural Handicap (LFA) measures: The main differences relate to countries that have a slightly different delivery approach to delivery and the organisational level of delivery. For example, in Belgium, the measures are delivered at the regional level, with a separate agency having responsibility for Axis 2 measures in Flanders, in Greece, each Axis is the responsibility of a separate state level agency, and in England Axis 2 measures are delivered by one state agency, with Axis 1, 3 and 4 measures delivered by a separate agency at the regional level. In some countries, expert advice from specialists is used in relation to specific measures, such as the Natura 2000 measures (this is the case, for example, in Lithuania and Slovenia).

Farm Modernisation measure: There are some differences between this measure and the ones described above, with some minor differences in terms of the organisations involved in delivery compared to the Axis 2 Measures. In Hungary, for example, the Ministry of Agriculture and Rural Development identifies the areas for investment and the measure is administered by central government organisations. In Greece, there are separate State Agencies for Axis 1 and Axis 2, and while data are collected by local offices, all decisions are made centrally. In Slovakia, there is more involvement from private sector consulting companies in terms of provision of advice for measure 121, with limited input from the government.

6.6 Provision of advice and information

Advice and information have proven to be crucial for the success of Rural Development schemes in different contexts and for the successful achievement of scheme objectives and the delivery of public goods. This is particularly the case where the choices facing farmers in terms of desirable management or investment are not straight forward. In addition, this is also an area where inter-departmental coordination is valuable. Many RDPs are delivered by agricultural administrations, whereas some measures can benefit from extension support by officials working in environmental and community administrations, including local government. Arrangements for the provision of advice to land managers also vary across Member States. All countries that responded to the Member State Survey appear to have a mix of public and private sector arrangements for provision of advice, using a mix of EAFRD, state and private funding, and more than one organisation that is actively providing advisory services. Although some advice provision can be centralised or delivered through the internet, some is better communicated at the farm level. Most governments appear to provide support for farmers to obtain advice and up-to-date information about agricultural activities. In some countries, the arrangements have been in place for a long time (for example, Greece, Lithuania), whereas in others, relatively new institutions have been established using EU funding (for example, Hungary). The trend in the Member States appears to have been to privatise extension services, often to economise on public spending. However, only Slovakia indicated a complete lack of government involvement in the provision of advice with this activity being delivered through the private sector. However, in this case farmers can get RDP support for advisory services (for more details see Annex 1).

6.7 Human capital and institutional capacity

The effective and efficient delivery of scheme objectives and therefore public goods through Rural Development programmes is far from a mechanistic process and it requires the application of considerable skill and attention, with the deployment of appropriate human resources. This relates not only to the number of people involved in the process, in the administration, but also to the quality of technical resources and expertise (for example the establishment of adequate databases), the understanding of staff of the dynamic interactions between agriculture and the relevant public goods, and previous experience in running the schemes. Ensuring effective and efficient delivery is not only relevant for public administrations and institutions. Promoting active roles for the private sector (associations, farming organisations, consultant firms, etc.) and also local community representatives (counties, provinces, communes/municipalities, mountain communities, etc.) can make the delivery of schemes more effective, resulting in interesting approaches and solutions.

There is considerable variability in the way in which environmental and agricultural institutions operate in each Member State. Most Member States indicated that the two sets of interests work well together although there is always room for improvement. In a small minority of countries explicit conflicts were noted. Clearly these need to be addressed.

In general, the relationship between environmental and farming organisations is reported to have had a significant impact on how the measures have been implemented. In Member States with good working relationships (for example, the Netherlands), the outcomes are identified as positive. In both Finland and Estonia, the high level of cooperation has resulted in improved implementation, for example in Estonia, better agreement on objectives and more transparent objectives and use of funds. Hungary illustrates the significance of cooperation not just between agricultural and environmental institutions – but also between different organisations in the same policy sector (for example, Ministry of Agriculture, research institutes, and payment agency) in order for both legislation and its implementation to be successful. In contrast, where there is conflict between the two policy areas then a range of problems have been identified. In Slovakia, for example, conflict and lack of communication are perceived to have reduced the effectiveness of measures. In Greece, the lack of cooperation is illustrated by problems over Natura 2000 areas and differing

approaches to solving water related issues with respect to Measure 214. Correspondents in Malta indicated that environmental sector requirements such as environmental impact assessments and permits can delay implementation of the measures as certain investments and projects cannot be made without agreement from environmental institutions. Where there are poor working relationships these delays are likely to be significant (for further details see Annex 1).

In terms of staff capacity, respondents indicated a range of situations from those having sufficient staff (for example, the Netherlands, Finland, Latvia, Lithuania) to those who did not consider there was sufficient staff involved in the delivery of RDPs (for example, Greece). Some Member States indicated potential problems or shortcomings such as Estonia, which indicated a threat to programme implementation due to staff cut-backs, over-centralisation of programmes (Greece), or the politicisation of many programmes (Slovakia), which can lead to political interference and high levels of staff turnover when governments change.

6.8 Networking, coordination and effective communication

The development of networks, personal relationships and communication channels between agencies involved in the management of various funding streams and between the region and the central administration is widely reported as a factor of success in improving both the delivery and uptake of schemes. Networking and co-ordination can be between government bodies, regional and central agencies, between government and external stakeholders, and between EU Member States. Networking should be strengthened through the work of the National and European Rural Development Networks which are now a requirement of RDP programming and delivery and the opportunity should be taken to share experience more widely.

6.9 Effective monitoring and evaluation

The monitoring and evaluation of the impacts of rural development expenditure is critical to demonstrate the specific impacts and outcomes of specific actions in order to be able to assess their effectiveness in delivering against their objectives. In assessing the outcomes achieved through the use of specific measures, particular attention needs to be paid to determining the factors that have contributed to the relative success or failure in achieving the stated objectives. This is critical to inform the sorts of improvements that are needed in terms of the design and targeting of support. The Common Monitoring and Evaluation Framework (CMEF) provides a good foundation for the systematic monitoring of the outputs and impacts of rural development measures across the EU-27 Member States, although there are issues with the availability and accuracy of some of the baseline data provided as well as significant inconsistencies in the indicator target figures put forward by Member States, particularly in relation to the result and output indicators. In addition, important environmental issues are not covered by impact indicators, most notably indicators related to water availability, soil functionality and landscape character.

Some of these limitations are due to the difficulty in developing robust indicators to measure change where complex interactions need to be measured. In other cases the issue is related to the limitations of data availability at the national level. For example, there are considerable gaps in data availability on certain aspects of public good provision in some Member States, particularly in relation to data on the baseline situation prior to the application of rural development measures. There is also a need for more emphasis to be placed on establishing the counterfactual in evaluations in order to identify what has occurred on farms not participating in a measure as well as the need for the objectives of schemes and measures implemented to be articulated and specified more clearly. Increased investment in the monitoring of scheme impacts is important to ensure that future support payments are able to deliver against their objectives in the most cost effective manner possible.

7. Conclusions

This report provides an overview of the way in which Rural Development Programmes (RDPs) in the EU-27 Member States seek to encourage the delivery of a range of environmental and social public goods associated with agriculture for the programming period 2007-2013. Public goods associated with forestry whilst potentially significant, are outside the scope of the study. This report seeks to provide a more detailed analysis than has been available previously of the potential contribution of RDPs as a whole, and individual rural development measures in particular, to the provision of a range of selected public goods in different regions of the European Union.

There is a wide range of farming practices that provide environmental public goods and whose continuation is vital if these public goods are to be delivered at the level demanded by society. Two categories of practices can be identified as being most associated with the provision of these public goods. Firstly, there are those that are inherently less intrusive on the environment, for example, those that do not involve deep cultivation, irrigation, heavy input use, the removal of semi-natural vegetation etc, and secondly, those that are designed to address a specific environmental concern, for example, the use of buffer strips, skylark scrapes, or slurry injection. There is a growing body of evidence to suggest that it is the more extensive livestock and mixed systems, the more traditional permanent crop systems and organic systems that are particularly important for the provision of environmental public goods. However, there is also a large potential for highly productive systems to adopt environmentally beneficial production methods and therefore to help maintain and improve the state of environmental public goods.

With reference to more social public goods, the link between rural vitality and agriculture is important and appears most significant in certain regions, such as in the Mediterranean and large parts of the new Member States, where agriculture continues to be one of the principal forms of permanent employment. In other areas, even where agriculture's share of the workforce has dwindled and other sectors play a more important role in the rural economy, social networks, customs and traditions in rural communities continue to be influenced by their agrarian past. Retaining a sufficient population density in rural areas to underpin local services and infrastructure as well as to keep alive rural customs, traditions and heritage is, therefore, often key to maintaining rural vitality. Providing suitable employment opportunities, whether through farming or other associated economic activities, alongside developing capacity within rural communities, building human capital, skills and knowledge will all help rural communities to adapt to the diverse pressures facing them. Creating critical social mass and networks can be central to fostering rural vitality.

Although estimates of the current scale of public goods provision through EU agriculture are notoriously difficult to derive, there is evidence of an undersupply of environmental public goods when compared to public demand, as articulated through environmental targets, objectives and goals. The provision of public goods through farming competes with the production of private goods such as food or biomass. Trends towards intensification and concentration of production diminish the supply of environmental public goods. Furthermore, the limited profitability of some forms of agriculture, such as extensive grazing, leads to trends of marginalisation/abandonment of farmland, resulting in an undersupply of public goods associated with these agricultural land uses.

Rural development policy through the EAFRD provides a framework within which the resources and policy measures to encourage the provision of public goods through a deliberate and targeted approach are made available and trade-offs between different objectives can be addressed. A wide range of measures exist within the RDPs that have the potential to deliver public goods. Having reviewed the 88 RDPs the study found that out of the 36 measures in EAFRD, 31 aimed to encourage rural vitality, 30 aimed to benefit agricultural landscapes, and 29 to benefit farmland biodiversity. However, although there is a large number of measures within all four Axes of Rural Development policy with the potential to deliver public goods, at present there is only a small number of measures which have

primary environmental objectives. The successful delivery of public goods depends in particular on measures having objectives which are explicit in this regard.

Member States are given a high degree of flexibility in terms of the choice of measures used and the way in which schemes are designed and targeted at the national/regional level. The measures provide a range of different types of incentives. These can be divided into three main categories: area based payments that provide incentives to farmers to carry out beneficial land management practices; investment aid that provides assistance with the costs of physical capital investment; and measures that provide advice, training and capacity building to improve human capital.

The most significant proportion of total planned expenditure in all RDPs relates to the area based land management measures (accounting for over 50% of the total budget). Given their focus on land management, the majority of these measures have the potential to deliver significant beneficial environmental outcomes, supplying multiple public goods. The agri-environment measure is the most significant in this regard, although other measures can play a substantive role in delivering a range of public goods.

The focus of these measures in RDPs tends to be on maintaining extensive management practices through the agri-environment, LFA and Natura 2000 measures (including organic management). The aim is to benefit farmland biodiversity and agricultural landscapes in particular, although some measures are more focused on water quality, soil functionality and carbon storage. While this is likely to help address the risk of abandonment and may prevent intensification, there is considerable scope for more focused/targeted options to be used to enhance and restore degraded areas or to focus on the needs of specific species/habitats, and for these to be targeted at particular areas. By maintaining agricultural production in areas where this is at risk of abandonment, these measures also contribute to maintaining rural vitality.

Measures for investing in capital infrastructure in relation to agriculture – on and off farm – and investments in rural areas also attract significant resources from EAFRD. A range of the Axis 1 investments are used to encourage the provision of environmental public goods, particularly in relation to soil and water quality, for example through the introduction or improvement of more efficient irrigation technologies, manure storage and handling facilities etc. However, some investments can be in conflict with other environmental priorities, and some examples of negative impacts were found with regard to biodiversity and landscape in particular, highlighting the need for appropriate and effectively enforced safeguards to be in place.

Advice, information provision and training all have an important role to play in encouraging farmers to change their behaviour and to implement appropriate practices in support of the environment. Together they have been highlighted as a critical element for the success of Rural Development schemes in different contexts and for the effective achievement of scheme objectives and the delivery of public goods. Expenditure on these measures is still very small in all RDPs and there is significant potential to increase the resources allocated to them, particularly in conveying information on the relationship between land management practices and the environment and efficient ways of reducing agriculture's environmental impact.

A healthy, attractive environment can also provide socio-economic benefits. There is evidence to show that rural development measures, which are focused on the delivery of environmental outcomes, can also have indirect socio-economic impacts, by stimulating employment, tourism, the production of added value products as well as through building capacity amongst farmers and other local actors. This in turn helps to support rural vitality. However, there is limited empirical information in the literature on the scale of these indirect effects of environmental public goods on social and economic development in rural areas. The availability of literature from Member States is also variable, with quantified information found mainly in countries such as the UK which were 'early adopters' of environmental land management payments.

The design, targeting and delivery of rural development schemes in practice is a critical means of delivering the specific outcomes needed to support the maintenance or improvement in the state of many environmental and social public goods. Despite progress made this appears to be a priority for the development of rural development measures at the EU level and in many Member States. The present suite of measures implemented within RDPs, contributing to the provision of public goods comprises some that are tightly targeted, whilst other lack precision in this regard. This can lead to unsatisfactory results and an inefficient use of resources. Measure objectives need to be specified precisely, and efforts are needed to target the use of measures precisely on specific public good outcomes while taking into account possible positive or negative side-effects. Appropriate targeting, which leaves sufficient discretion to the judgement of farmers and those applying policy on the ground, is essential to secure specific outcomes.

There are some gaps in information that have been highlighted through this study which are worthy of further work. Firstly, there is a clear need for more detailed information on the impacts on the ground of specific rural development measures and the individual actions that are supported under them. The CMEF indicators are a good start in this regard and will provide some useful information once the results of annual reporting become available. More detailed information from ex post evaluations would be helpful. In addition, there was a significant absence of information within the RDPs on the way in which measures might be used in combination to provide an integrated approach to addressing environmental or social needs. This may be partly a factor of the way in which the EAFRD is structured, but it would be helpful if this issue were considered within ex post and mid-term evaluations of the RDPs. Secondly, the review of RDPs has highlighted some instances where multiple public goods can be provided synergistically, as well as other instances where conflicts have arisen. Further analysis on the synergies and conflicts between different public goods would be worthwhile. Thirdly, this study has confirmed the lack of empirical information on the indirect socio-economic benefits of rural development measures focused on the delivery of environmental outcomes in the majority of Member States. This is a significant gap in the evidence base, particularly as the literature that does exist suggests that such schemes can deliver significant socio-economic benefits. Finally, a wide range of different approaches are taken by different regions in the design, targeting and delivery of their RDPs. There is a role for more exchange of good practice and lessons learned between Member States and regions and the ENRD has a valuable role to play in facilitating this process.

The analysis of the way in which Member States have approached the delivery of public goods through their RDPs for the 2007-13 programming period provides some useful lessons that need to be learned to improve the delivery of public goods in the next programming period. In summary, the key issues that are highlighted by this report include:

- Recognition that the delivery of environmental public goods and rural vitality involves long term commitment and that positive results will often only become apparent over time. The design and implementation of measures is an on-going process in which schemes evolve and improve over time.
- The need to take an integrated approach in determining the most effective and efficient means of delivering public goods. This requires consideration of the synergies that exist between different public goods to find ways of supporting measures or packages of measures that maximise the provision of multiple public goods and minimise any potential conflicts.
- Improvements need to be made in the way that measures are targeted and their impacts measured. Clear objectives need to be set for all measures and schemes implemented in RDPs, with their intended outcomes specified in advance. The measurement of the impacts of these measures on the provision of all public goods should be required – for example by extending the current suite of CMEF impact indicators to cover environmental issues such as water quality, carbon storage, soil functionality and landscape as well as developing indicators that can measure impacts on rural vitality.

- Investment is needed in building institutional capacity in relation to the design and delivery of rural development measures. This is critical for the effective and efficient delivery of scheme objectives. The value of this investment in the skills, knowledge and technical resources needed should be recognised as an essential component of successful and efficient scheme delivery.
- Investment is also needed in collecting empirical information at the programme level on data to demonstrate the outcomes of schemes, both in relation to environmental and socio-economic data. In addition, given the varied local environmental, social and economic contexts, issues and needs in the EU-27 and the multiplicity of response to these needs in different regions, there is a need for enhanced exchange of good practice and lessons learned between Member States and regions.

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Annex 1 Methodological considerations and caveats

Two tasks were carried out under Step 1 of the TWG work plan. Firstly all 88 RDPs for the 2007-13 programming period were screened, using a common template, to assess the ways in which the RDP measures are being used to deliver public goods (Task 1.1). Given the timing of this screening exercise it was not possible to consider the changes made to the RDPs as a result of the CAP Health Check. Secondly a Member State survey was carried out in 19 Member States⁶ to provide more detailed information on certain aspects of public good delivery, particularly information on those management practices that are most significant for the provision of public goods, the risks for undersupply public goods and information on the administrative aspects of scheme implementation (Task 1.2).

The RDP screening exercise sought to collate information on:

1. Which RDP measures are being used to deliver the environmental and social public goods associated with agriculture that form the focus of the study;
2. What specific activities are being incentivised under specific measures and the relationship of these activities with the delivery of these public goods;
3. The way in which different measures are being implemented within the Member State / Region and the scale at which measures are administered; and
4. The resources allocated to the delivery of the public goods, including costs within the RDP budget as well as additional national delivery costs (administration, advice etc).

A group of regional experts from a range of Member States were asked to review the RDPs and to complete a set of standard screening 'fiches' with the information set out above. The key findings from these fiches were then summarised in a series of overview summary sheets. These fiches and summary sheets have subsequently been brought together in a number of master spreadsheets, on which the findings set out in the report are based. In addition, findings from an earlier screening exercise, carried out by the Contact Point, looking at the way in which RDPs are used to deliver climate change objectives have also been incorporated into the master spreadsheets and the subsequent analysis.

The Member State survey sought to collect information to:

1. Clarify the nature of the relationship between different agricultural land uses, land management practices and the provision of public goods in a range of EU countries. It provides further information and a cross check on the data collected by the DG AGRI Public Goods Study to make it more representative for all 27 Member States.
2. Provide information (qualitative and quantitative) on any threats to the supply of public goods within individual Member States, and the reasons for this in order to identify which are at greatest risk.
3. Assess issues concerning the delivery of public goods on the ground, through collecting information on the institutional structures through which the provision of public goods is secured, the administrative level at which policies are delivered and identifying any problems that are encountered, for example in relation to administrative capacity.

⁶ This work has been carried out alongside a study for DG Agriculture on 'The Provision of Public Goods Through Agriculture in the European Union' (Cooper *et al.*, 2009) and seeks to complement the research and analysis that has been carried out within that study. In order to avoid any duplication, the Member State survey only covered those countries which were not the focus of case studies under the DG Agriculture study. The case studies for the DG Agriculture study were: Czech Republic, France, Germany, Italy, Romania, Spain, Sweden, United Kingdom (England).

4. Identify mechanisms beyond rural development policy that are used to secure the delivery of public goods and their funding sources, particularly focusing on any innovative approaches used.

A set of standard questions, in the form of a questionnaire, were sent to government officials working on rural development policy development and delivery in. Information was received from 14 Member States (Austria, Belgium, Bulgaria, Estonia, Finland, Greece, Hungary, Latvia, Lithuania, Malta, the Netherlands, Poland, Portugal and Slovakia). Telephone interviews were carried out with individuals in Bulgaria, Finland, Greece, Lithuania, Portugal and Slovakia and data from the other Member States was submitted through written responses to the questionnaire.

While a wealth of data has been collated through these two tasks, some limitations to their interpretation should be noted, as these influence the results presented in the report. Firstly, in relation to the RDP screening exercise, the information collected gives an indication of what Member States were proposing to do during the programming period and gives no indication of what has been achieved on the ground in reality.

A second caveat is that, due to the fact that public good provision is not necessarily stated as a core rationale for many of the measures within RDPs, the experts evaluating the programmes have had to use their judgement and interpret the extent to which measures deliver against individual public goods. This means that there is inevitably some variability/subjectivity in the interpretation of the RDPs and as a result some issues arise in terms of the consistency of data between RDPs. Where these have been noted this has been highlighted in the text. In addition, the level of detail provided through the screening exercise in terms of measures and actions varies. This may be to do with the RDP itself (different levels of detail within the RDP document), but it may also be to do with the way in which (or the extent to which) the information was extracted/summarised by the assessors. The result is that while for some RDPs there is a wealth of information on the different public goods and their proposed delivery by specific actions under a measure (for example, buffer strips, arable reversion etc under the agri-environment measure (214)), in other cases information is only provided for the measure as a whole. The result is that while the measure data is good, the action data is less comprehensive than it could be.

A third caveat is that the information relating to climate stability – carbon storage and greenhouse gas emissions – has been derived from a previous screening exercise carried out for the European Commission by the Contact Point. This exercise was undertaken for a different purpose and, although similar information was sought, the questions asked were framed slightly differently. The results of that screening exercise have, therefore, had to be interpreted for the purposes of this analysis and some anomalies have become evident. Most notable is the figures for the degree to which RDPs address climate related public goods may be over represented compared to the other public goods. This is because they have been reviewed and assessed separately, and therefore it is possible that the figures are more comprehensive than those for other public goods. An additional problem with the climate change figures is the fact that the figures were collated for climate mitigation, climate adaptation and renewable energy but these then had to be “converted/interpreted” to demonstrate the potential delivery of climate related public goods through the RDPs.

In relation to the Member State survey the quality of data received is variable, and in all cases there are gaps in the information. None of the questionnaires, even those carried out by phone, resulted in completion of all the questions. The most difficult question, and the one for which there is least information, is that on administration costs where there were very limited responses with nearly all respondents stating that it was too difficult to source such information. Information on alternative instruments used for the delivery of public goods was difficult to obtain as respondents often did not have information beyond their immediate area of operation.

Given the limited empirical information in the literature of ‘spill-over’ or ‘second-order’ effects of environmental public goods on social and economic development in rural areas, evidence of these impacts was sought as a separate exercise, under Step 3 of the TWG work plan. A

series of rural development experts, including academics and government officials, from a range of Member States, were contacted to provide specific examples or evidence on the indirect socio-economic effects of those rural development measures whose prime objective is to deliver environmental public goods. A template was provided for the collation of information. A number of specific examples, largely relating to the agri-environment measure were received from 6 Member States. However, as with previous exercises that have been undertaken to find this sort of evidence, the majority of quantified data assessing the socio-economic impacts of environmental public goods relates to the UK.

ANNEX 2 Institutional arrangements and capacity for the delivery of rural development programmes

RDP Measure Delivery

The following tables provide a summary of the administrative level of delivery and the organisations responsible for the delivery of the agri-environment measure, the natural handicap measures, the Natura 2000 measure and the farm modernisation measure in those Member States that responded to the questionnaire survey.

Annex Table 1 Summary of delivery: Agri-environment (214)

Member State	Administrative level for delivery of the measures	Organisations responsible for delivery of the measures	Status
Austria	Through RDP		
Belgium	Regional (Flanders/Walloon Region)	In Flanders: Dept. of Agriculture and Fisheries – Division of Sustainable Agricultural Development (ADLO) Flemish Land Agency – Countryside Division	
Bulgaria	National (applications made at regional level)	Ministry of Agriculture, PA delivering measures	Government
Estonia	National	Ministry of Agriculture (MoA); Agricultural Registers and Information Board (ARIB, paying agency), Board of Environment	Government, government agency
Finland	National	Ministry of Agriculture and Forestry	Government
Greece	National The same agency covers measures 214, 211, 212 and 213. A separate agency deals with 121.	For Axis 2 there is a specific state run agency. Each Axis now as its own managing authority at state level – there are now 5 agencies involved – one for each axis and a fifth to cover a range of other issues. Some monitoring committees meet every 6 months	Central government Mix of members – govt, and NGOs represented.
Hungary	National	Ministry of Agriculture and Rural Development Agricultural and Rural Development Agency	Ministry Paying agency
Latvia	National	Ministry of Agriculture, Rural Support Service	Government and governmental agency
Lithuania	Complex administration from national down to local level – smallest administrative unit are the municipalities.	The main controlling institutions are: Ministry of Agriculture Ministry of Environment National Paying Agency	Government
Malta	National	Rural Development Department (RDD) – Programming; Paying Agency	RDD – Government Department; PA – Government Agency

		(PA) – Implementation, Controls, Payments & Audits	
Netherlands	Provinces	Paying Agency and delegated body	Government
Poland	National	Ministry of Agriculture Agency for Modernisation and Reconstruction of Agriculture	Government Paying agency
Slovakia	National and regional. Network of regional offices of the Paying Agency have competence and responsibilities in some areas (e.g. collecting applications)	Agricultural Paying Agency has overall responsibility for implementation. Other organisations: State Nature Conservancy Soil Science Institute Union of Breeders	Government agency Govt. agency NGO

Annex Table 2 Summary of delivery: Natural Handicap (LFA) (211 and 212)

Member State	Administrative level for delivery of the measures	Organisations responsible for delivery of the measures	Status
Austria	RDP		
Belgium			
Bulgaria	National	Ministry of Agriculture, PA delivering measures	Government
Estonia	National	MoA, ARIB	Government, government agency
Finland	National	Ministry of Agriculture and Forestry	Government
Greece	National The same agency covers measures 214, 211, 212 and 213.	For Axis 2 there is a specific state run agency. Some monitoring committees meet every 6 months	Central government Mix of members – govt, and NGOs represented.
Hungary	National	Ministry of Agriculture and Rural Development Agricultural and Rural Development Agency	Ministry Paying agency
Latvia	National	Ministry of Agriculture, Rural Support Service	Government and governmental agency
Lithuania	National down to local Municipalities also involved in taking application forms from farmers.	Ministry of Agriculture National Paying Agency	Govt.
Malta	National	RDD – Programming; PA – Implementation, Controls, Payments & Audits	RDD – Government Department; PA – Government Agency
Netherlands	Provinces	Paying Agency and delegated body	Government
Poland	National	Ministry of Agriculture Agency for Modernisation and Reconstruction of Agriculture	Government Paying agency
Slovakia	National and regional. Network of regional offices of the Agric. Paying Agency	Agricultural Paying Agency is the body with overall responsibility	Govt.

	have competence in some areas (e.g. collecting applications)	Soil Science Institute (classification of LFAs) Institute of Agricultural Economics	Govt. agency State body
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Annex Table 3 Summary of delivery: Natura 2000 (213)

Member State	Administrative level for delivery of the measures	Organisations responsible for delivery of the measures	Status
Austria	RDP		
Belgium	Regional	In Flanders: Flemish Land Agency – Division Countryside	
Bulgaria	Not yet designated, in process		
Estonia	National	MoA, ARIB	Government, government agency
Finland	National	Ministry of Agriculture and Forestry	Government
Greece	Not implemented yet in Greece		
Hungary	National	Ministry of Agriculture and Rural Development Agricultural and Rural Development Agency	Ministry Paying agency
Latvia	National	Ministry of Agriculture, Rural Support Service	Government and governmental agency
Lithuania	Cooperation between different institutions at national and local level	Ministry of Environment and administration boards of protected areas	Govt.
Malta	Not applicable		
Netherlands	Not used		
Poland	Not used		
Slovakia	National and regional. Very limited – application only to 4,000-5,000 ha of agricultural land (more impact on forest land) Common application process for all these measures (214, 211, 212, 213)	Agricultural Paying Agency is the body with overall responsibility. State Nature Conservancy (applies management conditions)	Govt. State body

Annex Table 4 Summary of delivery: Farm Modernisation (121)

Member State	Administrative level for delivery of the measures	Organisations responsible for delivery of the measures	Status
Austria	RDP		
Belgium	Regional	In Flanders: Agency for Agriculture and Fisheries – Division Structure and Investments	
Bulgaria	National	Ministry of Agriculture, PA delivering measures	Government
Estonia	National	MoA, ARIB	Government, government agency
Finland	National	Ministry of Agriculture and Forestry	Government
Greece	Nationally designed but some regional authorities involved in delivery	State agency for Axis 1 and local/regional offices collecting applications. Decisions are made centrally	Livestock issues – Ministry of Agriculture Arable – regional authorities.
Hungary	MARD decrees of measures based on NHRDP Modernisation of animal breeding farms and support for biomass production. Protection of inland inundation and drought, irrigation and water management measures.	MARD ARDA Office of Agricultural Administration	governmental organisations
Latvia	National	Ministry of Agriculture, Rural Support Service	Government and governmental agency
Lithuania	National to local	Ministry of Environment And institutions under it (for controlling the environmental requirements)	Govt.
Malta	National	RDD – Programming; PA – Implementation, Controls, Payments & Audits	RDD – Government Department; PA – Government Agency
Netherlands	Not used for public goods		
Poland	National	Ministry of Agriculture Agency for Modernisation and Reconstruction of Agriculture	Government Paying agency
Slovakia	National and regional. Different system from other measures – farmers prepare applications for projects with consulting companies. Govt. not active in provision of advice.	Agricultural Paying Agency is the body with overall responsibility for implementation. Consulting companies/individuals	Govt. Private sector/commercial

Provision of Advice to Land Managers

The following table sets out the arrangements for the provision of advice to land managers within the countries that responded to the Member State survey.

Annex Table 5 Provision of advice to land managers in Member States

Member state	Name of organisation	Funding	Delivery of advice
Belgium	Several organizations: Department of agriculture and fisheries (local divisions), Flemish land agency (through 'farm planners'), farmers' organizations, nature organizations, non-profit organizations, firms (e.g. selling fodder), etc. Mostly state-funded	Mostly state-funded	Folders and documentation, in person, help with administration, planning, e-services
Estonia	Estonian Chamber of Agriculture and Commerce is co-ordinating the county-based advisory centres. From 2010, advisory activities will be transferred to the Rural Development Foundation.	Mainly RDP funds (Articles 24–25 of 1698/2005). Applicants for agri-environmental support are also supported through the RDP: applicants for environmentally friendly management, organic farming and maintenance of semi-natural habitats must also pass an obligatory training in environmental issues. This is mainly carried out by advisers.	To get appropriate advice, a producer will turn to the advisory centre or to an agricultural adviser. Advisers are assembled to advisory centres. In addition, agricultural advisers aggregate and systematize the needs of producers, regarding applied research, information days and printed material, and pass scientific information on to agricultural holdings.
Finland	Agency for rural affairs/(locally TE-centres) concerning the terms of the measures, otherwise private organisations, e.g. The ProAgria Rural Advisory Centres and the ProAgria Association of Rural Advisory Centres	Agency for rural affairs by public funding, ProAgria by customers	Agency for rural affairs/(locally TE-centres): orders, guidelines, personal contacts, web The ProAgria Rural Advisory Centres and the ProAgria Association of Rural Advisory Centres: guidelines, personal contacts, web
Greece	Extension service is the main organisation. State owned and run – has been around for a long time. Not only advisory role – also delivers the measures – collects in applications, checks payments, engages in monitoring activities. Also private advisory services and consultants (e.g. fertiliser companies provide advisors to farmers) – not officially supported but can be very effective especially as the Extension Service is	Public funding	54 prefectures. Each prefecture has a rural Development Directorate – these are run by the prefectures and defer to the prefect. Also in every Prefecture there is an advice centre, run by the Ministry of Agriculture, Rural Development and Food – this is a new development. Also the private sector advice working through individuals, consulting firms

	overburdened.		and agro-chemical companies.
Hungary	<p>i. Ministry of Agriculture and Rural Development (maintain, regulate and control the Farm Advisory System)</p> <p>ii. National and Regional Advisory Centres (implement government tasks related to the Farm Advisory System, e.g. the advisors' registration and training)</p> <p>iii. Territorial Advisory Centres (provide advisory service for the farmers on market basis)</p> <p>The farmers' information service operated by the Hungarian Agricultural Chamber also provides information on the connections between farming and the delivery of public goods.</p>	<p>The Farm Advisory Service financed partly from the national budget, partly from the Technical Assistance measure of the New Hungary Rural Development Program (NHDRP). 80% of the costs of the advisory service financed from measure 124.</p> <p>Use of advisory services (NHDRP), 20% is paid by the farmer that uses the service. The amount of aid for one farmer cannot exceed EUR 1500 for the whole duration of NHDRP.</p> <p>NHDRP aids - source of the aid is partly the national budget (29%), partly the EARDF (71%).</p> <p>This service is financed 100% under the NHRDP measure 111 Training and information activities.</p>	
Latvia	Latvian Agricultural Advisory Centre	Partly state and part private fees	Consultants are located in each administrative unit.
Lithuania	Agricultural advisory service is the main organisation. Also a lot of private advisory services.	Govt. funded but several sources	Branch offices throughout Lithuania – farmers can contact them directly.
Malta	Farm Advisory Service Providers recognised by the Ministry for Resources and Rural Affairs.	Establishment and running costs: Farm Advisory Service Providers through Measure 115. As regards the costs of advisory services for farmers also funded through Measure 114.	Training and individual advice on business management, sustainable agriculture, animal welfare & hygiene, good practices, health & safety, food standards, legal aspects of rural development & environmental protection.
Poland	Public advisory system: - Centre for Agriculture Advisory - supervised by the Ministry of Agriculture, - regional advisory institutions supervised by the government of the regions, - Some private advisory companies.	State funded mainly but private companies are independent	Contact with farmers, publications, assistance with documentation, training, and personal contact
Slovakia	No specific organisation – government not active here.	From 2007 under RDP farmers can get refunds	Private sector companies and individuals.

	<p>Ministry of Agriculture certifies advisors (through exams) who then act in private capacity to advise farmers.</p> <p>Some NGOs are active in this area but assistance is unofficial and irregular.</p>	for money spent on purchasing advice.	
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Liaison between environmental and farming institutions and impacts on scheme delivery

Annex Table 6 The degree to which farming and environmental organisations work together

Member State	Strengths	Weaknesses
Austria		
Belgium	The organizations themselves do make an effort to work together in a good way	Confusing for the farmers that there are so many organizations
Bulgaria	They cooperate but...	...there is still room for improvement and better efficiency
Estonia	Recent improvement. Environmental institutions and NGOs are represented on RDP steering committee. Environmental legislation and RDP support schemes developed in close cooperation between relevant ministries and representative stakeholders	
Finland	Good cooperation	
Greece		Not very well – even within the same institute. The various bodies do not actively collaborate. There is no involvement of the Environment Ministry in the Axis 2 management body.
Hungary	On the governmental level, farming and environmental organisations, as well as the other ministries and governmental agencies are expected and encouraged to express their views and participate in the elaboration of the national regulations on the different measures. The ministry and its agencies, as well as the numerous agricultural (research) institutes are cooperating on a daily basis.	
Latvia	Both of them are represented in the Monitoring Committee of RDP and other inter-institutional consultative bodies, such as agriculture-environment advisory council.	
Lithuania	They work together well – room for improvement but generally quite good	
Malta	Communications and flow of information is fine	Public policies often conflict, e.g. environmental policies imposes burdens on agriculture. A lot of bureaucracy for a small country
Netherlands	Quite well	
Poland	Works well – Constantly being improved and still room for more improvement. More common	

	questions to be discussed in future	
Slovakia	They talk to each other but not much more.	Cooperation could be better – particularly to enable more effective lobbying of policy makers.

Annex Table 7 The effects of good or poor cooperation on the effectiveness of delivery of public goods

<i>Agri-environment measure (214);</i>		
Bulgaria	-	Memorandum of Understanding signed between Ministry of Environment and Agriculture, as some areas are within National Parks, cooperation is fine and networking activities take place
Estonia	-	delivers environmental public goods
Finland	-	working together in Monitoring Committees and engagement in common preparation of measures
Greece	-	strongly affected - there is need for more involvement – in particular over water quality issues and a need for action plans for managing water.
Hungary	-	Both during the development of the measure in the New Hungary Rural Development Programme, and the legislative work afterwards the comments and recommendations of the different farmer and environmental organizations were taken into account. There were heated debates especially during the national legislative process, but at the end, both "sides" were content with the regulation.
Latvia	-	both partners are involved in the discussions seeking for compromise
Poland	-	working together in Monitoring Committee, wide consultation, sometimes too detailed prescriptions, but in general good effects
Slovakia	-	this has resulted in payments that are too low (e.g. for semi-natural grasslands) – and more effective lobbying could have resulted in higher payments, whereas in other cases payments are too high – e.g. for orchards and vineyards – because these producers were more effective at lobbying.
<i>Natural handicap (LFA) measures (211 and 212);</i>		
Bulgaria	-	Not affected at all, depends on farming activity
Estonia	-	covers half total area of Estonia
Finland	-	working together in Monitoring Committees and engagement in common preparation of measures
Greece	-	the Environment Ministry has no involvement here
Hungary	-	outcome of the scheme is mostly effected by the cooperation between the paying agency and the agricultural institute identifying the areas.
Latvia	-	both partners are involved in the discussions seeking for compromise
Poland	-	Positive effects
Slovakia	-	the approaches taken were generally acceptable to all interests.
<i>Natura 2000 measure (213)</i>		
Bulgaria	-	not designated yet
Estonia	-	cooperation meant strong support for Natura 200 objectives.
Finland	-	working together in Monitoring Committees and engagement in common preparation of measures
Greece	-	A huge problem to implement this because only 2 out of 165 Natura 2000 sites have a management plan. This is a result of the lack of interaction

	between government bodies – there are no action plans.
Hungary	- cooperation between the ministries/agencies/institutions is competent, which promotes the outcomes of the scheme.
Latvia	- both partners are involved in the discussions seeking for compromise
Poland	- not implemented
Slovakia	- this measure was strongly affected by the poor relationship and resulted in restriction of payments to small areas that are not attractive to farmers because they cannot combine these with agri-environment measures. As a result there are few applications, farmers tend to apply for Measure 214.
<i>Farm modernisation measure (121) where this is used for the delivery of public goods.</i>	
Bulgaria	- Cooperation between ministries, priority given to projects within vulnerable zones and to projects focusing on storage of manure
Estonia	- Modernisation of holdings clearly targeted at provision of public goods.
Finland	- working together in Monitoring Committees and engagement in common preparation of measures
Greece	- Environment ministry does not have much to do with this measure.
Hungary	- During the legislative process cooperation was required between the ministry and the agricultural research/machinery institutes. The outcome of the scheme depends on the efficient implementation of the measure, which is the task of the paying agency.
Latvia	- Participation of environmental partners is limited as they are not interested in participating.
Poland	- Good cooperation, and high engagement
Slovakia	- The environmental organisations do not care about this measure. - There were not enough people to argue strongly for the measure. It could have been a much more effective measure for the environment but lack of capacity on the part of environmental organisations meant missed opportunities.