# The Rural Development Programme for England, 2014 to 2020: Final Impact Assessment

Department for Environment Food & Rural Affairs

**Version No: 3.1**
**Issue Date: 10/04/2014**
**Author: RDP Economist Team**
**Document Status: Draft**
**Protection Level: Protect**

## Table of Contents

**Title:**
Rural Development Programme for England, 2014 to 2020
**IA No:**
**DEFRA1523**

**Lead department or agency:**
Defra

**Other departments or agencies:**
Natural England
Rural Payments Agency
Forestry Commission

# Impact Assessment (IA)

**Date: 27/03/2014**

**Stage: Final**

**Source of intervention: Domestic**

**Type of measure: Other**

**Contact for enquiries:**

**Andrew Robinson, Will Verrell, David Legg**

## Summary: Intervention and Options

**RPC Opinion:** Not Applicable

| Cost of Preferred (or more likely) Scenario | | | | |
|---|---|---|---|---|
| **Total Net Present Value** | **Business Net Present Value** | **Net cost to business per year** (EANCB on 2009 prices) | **In scope of One-In, Two-Out?** | **Measure qualifies as** |
| £2,482m | £3,690m | -£117m (net benefit) | No | NA |

**What is the problem under consideration? Why is government intervention necessary?**

The Impact Assessment explores the costs and benefits of the new Rural Development Programme expenditure announced by Government in December 2013 to ensure it delivers good value for money. It explores how it will a) meet legal obligations; b) correct for market failures; and c) achieve wider government objectives. The overarching market failure is the presence of environmental externalities associated with land-based activities. The Rural Development Programme seeks to address these and other market failures by encouraging land managers to invest more in the provision of environmental (or ecosystem) services and by promoting investments in farm and forestry productivity and in the growth of the rural economy.

**What are the policy objectives and the intended effects?**

The ambitions of the UK government for the new Rural Development Programme are to: a) promote strong rural economic growth; b) improve the environment: this includes helping to ensure that by 2021 the natural environment is improved as set out in the Natural Environment White Paper; and c) increase the productivity and efficiency of farm and forestry businesses, in order to improve their competitiveness and reduce the reliance of farmers and land managers on subsidies.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**

Option 0 is the baseline and represents the absolute minimum under current legal obligations. Option 1 referred to as the preferred option is based on the Government decision to transfer 12% from Pillar 1 to Pillar 2 of the Common Agricultural Policy (CAP) in England, with a review in 2016. The overall allocation of budget for the preferred option is focused on delivering environmental improvements. Evidence in this Impact Assessment shows that the preferred option allows a new Rural Development Programme with the scope and ability to deliver the desired policy objectives. It also shows the preferred option is worthwhile in terms of value for money. In this front sheet we display results for the preferred option. We include a sensitivity analysis in the evidence section that take account of uncertainty in benefit values and different funding allocation scenarios.

**Will the policy be reviewed?** It will not be reviewed. **If applicable, set review date: NA**

| | | | | | |
|---|---|---|---|---|---|
| Does implementation go beyond minimum EU requirements? | | | NA | | |
| Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base. | **Micro** Yes | **< 20** Yes | **Small** Yes | **Medium** Yes | **Large** Yes |
| What is the $CO_2$ equivalent change in greenhouse gas emissions? (Million tonnes $CO_2$ equivalent) | | | **Traded:** | **Non-traded: 10.4** | |

***I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.***

Signed by the responsible SELECT SIGNATORY: _____ Date: _____

# Summary: Analysis & Evidence

Policy Scenario 1

**Description: Option 1: Preferred Option: 12% Transfer Environment Focus**

**FULL ECONOMIC ASSESSMENT**

| Price Base Year | PV Base Year | Time Period Years | Net Benefit (Present Value (PV)) (£m) | | |
|---|---|---|---|---|---|
| 2012/13 | 2014/15 | 7 | **Low: £1,227m** | **High: £4,837m** | **Best Estimate: £2,482m** |

| COSTS (£m) | Total Transition (Constant Price) | Years | Average Annual (excl. Transition) (Constant Price) | Total Cost (Present Value) |
|---|---|---|---|---|
| **Low** | Optional | | Optional | NA |
| **High** | Optional | | Optional | NA |
| **Best Estimate** | | | | **£1,529m** |

**Description and scale of key monetised costs by 'main affected groups'**

Includes direct costs incurred by the UK Exchequer and European funding in terms of grants and payments in the Rural Development Programme, as well as the administrative costs associated with delivering the programme. The analysis also includes costs incurred by business, such as those associated with applying for Rural Development Programme funding and complying with monitoring and inspection. We also include an estimate of the contributions that beneficiaries make to the overall cost of funded projects.

**Other key non-monetised costs by 'main affected groups'**

All direct costs incurred as a result of the Rural Development Programme are estimated and monetised. There could perhaps be some second order impacts on private firms that could compete with Rural Development Programme interventions, such as banks competing on loans, training providers competing on skills development etc. However, to the extent that programme interventions address well established market failures these types of costs are likely to be minimised and are dealt with in the analysis by adjusting benefit estimates with appropriate additionality coefficients.

| BENEFITS (£m) | Total Transition (Constant Price) | Years | Average Annual (excl. Transition) (Constant Price) | Total Benefit (Present Value) |
|---|---|---|---|---|
| **Low** | Optional | | Optional | **£2,756m** |
| **High** | Optional | | Optional | **£6,366m** |
| **Best Estimate** | | | | **£4,012m** |

**Description and scale of key monetised benefits by 'main affected groups'**

For agri-environment and forestry interventions monetised benefits include carbon savings, air and water quality improvements and biodiversity and landscape benefits. A Social Return on Investment approach is used to monetise the economic, environmental and social benefits of investment in farm and forestry productivity. Growth Programme impacts on productivity have also been monetised. For community-led activities (LEADER) the impacts on business sales, local employment and tourism activity have all been monetised.

**Other key non-monetised benefits by 'main affected groups'**

Contributions to meet statutory and international obligations on habitats and biodiversity. Improvement to the historical environment at archaeological sites. Broader windfalls for local economies of landscape interventions. Broader benefits from forestry activities (e.g. recreation, habitats connectivity, flood protection). Broader socio-economic benefits for local communities (e.g. improved access to services).

**Key assumptions/sensitivities/risks** **Discount rate (%)** 3.5

Future inflation rate of 1.7%. All Rural Development Programme budget is able to be spent. No diminishing returns with respect to Rural Development Programme investment. There is limited availability of data on outcomes associated with farm and forestry productivity spending under the current programme. There is an implicit assumption that the new programme will be at least as effective as the present. Constant returns to scale are associated with the use of benefit to cost ratios in modelling benefit estimates. The ability of growth focussed measures to deliver growth and jobs impacts at the national level (as opposed to local rural development benefits) will depend on their ability to deliver supply-side improvements (standard additionality assumptions in line with BIS guidance have been used). Uncertainty ranges were estimated to reflect uncertainty on benefit realisation.

**BUSINESS ASSESSMENT (Scenario 1)**

| Direct impact on business (Equivalent Annual) £m: | | | In scope of OITO? | Measure qualifies as |
|---|---|---|---|---|
| **Costs: £182m** | **Benefits: £299m** | **Net: £-117m** | No | NA |

**Impact Assessment for the new Rural Development Programme, 2014 to 2020**

## 1. Summary

This is a final stage Impact Assessment. It sets out at a high level the need for the next Rural Development Programme for England, and assesses the Government's preferred option for the use of spend within the programme. The consultation stage Impact Assessment[1] examined a number of financial options as at that time it was unknown what level of inter pillar transfer would be available. In contrast this final assessment is based on the preferred option. It includes an updated evidence base from the consultation stage Impact Assessment and presents the potential impacts, costs and benefits of the programme over a 7 year period to 2020/2021.

In December 2013 Ministers agreed that in each year of the CAP period from 2014 to 2019, there will be a transfer of 12% of the budget from Direct Payments to farmers (Pillar 1) to Rural Development (Pillar 2). The total budget associated with this level of inter-pillar transfer is £3.5bn, which will be allocated to 4 components of the Rural Development Programme:

- Agri-Environment Schemes
- Farming & Forestry Productivity Support
- Growth Programme (via Local Enterprise Partnerships)
- LEADER (via Local Action Groups)[2]

A review will be held in 2016 into the demand for agri-environment schemes and the competitiveness of English agriculture with the intention of moving to a 15% transfer level in 2018 and 2019, the final two years of the CAP period. This scenario has not been modelled in this Impact Assessment as the outcome of the review is uncertain and additional evidence will be collected to inform this decision. A sensitivity analysis is presented on the impact of changing the allocation of spend within the 4 key programme areas to generate a range of expected costs and benefits that might be achieved in the next programme.

Table 1 below presents the two options presented in this Impact Assessment: the baseline option and the preferred option.

***Table 1:*** *Summary of Options*

| | |
|---|---|
| **Option 0:** | Baseline – funding existing legal obligations |
| **Preferred Option:** | Environmental Focus with 12% transfer for all years.<br>This assumes the same 12% transfer rate in 2018 and 2019 (after the review in 2016) |

[1] Available at https://consult.defra.gov.uk/agricultural-policy/cap-consultation New published evidence has been incorporated into the modelling work since the consultation stage. For example DCMS have provided better estimates on the impact of rural broadband which has enabled the BCR to be increased for this investment activity in the Growth Programme. All new evidence is clearly set out in the evidence section of this final IA.

[2] The LEADER approach is a delivery mechanism under the Rural Development Programme. It uses local knowledge to promote an integrated "bottom up", community-led delivery of Rural Development Programme funding. In England it is being implemented by 64 Local Action Groups and is targeted to rural areas with particular needs or priorities. The rationale for this is the belief that LEADER offers an added value compared with traditional top-down implementation. These benefits accrue through mobilisation of local potential, identification of local problems and increased responsiveness.

The do minimum option is the baseline against which the additional costs and benefits of the preferred option are assessed. This baseline option involves the minimum that would need to be done in the next programme without legal challenge from recipients of funding who hold agreements extending into the next programme, or a serious risk of infraction proceedings from the European Commission in relation to the Rural Development Programme. This involves a) meeting the contractual commitments from current agri-environment and forestry agreements that extend into the next programme period; and b) the EU legal obligation to spend 5% of the EU rural development funding through the local LEADER approach. Meeting the existing contractual commitments would also fulfil the legal obligation to have a new programme and to spend 30% of EU funds on environmental land management measures. This option requires, on average a transfer of 1% from Pillar 1 to Pillar 2 in England, based on assumptions set out in Annex A.

Chart 1 below displays the budget allocations for the preferred option. It also demonstrates the total nominal budget for each programme area. Environmental spending is the sum of existing commitments and the New Environmental Land Management Scheme, which accounts for 87% of the next programme budget as announced in the Government's consultation response.[3] This is compared with 83% in the current Rural Development Programme for England 2007-2013 (from now on simply 'RDPE')[4].

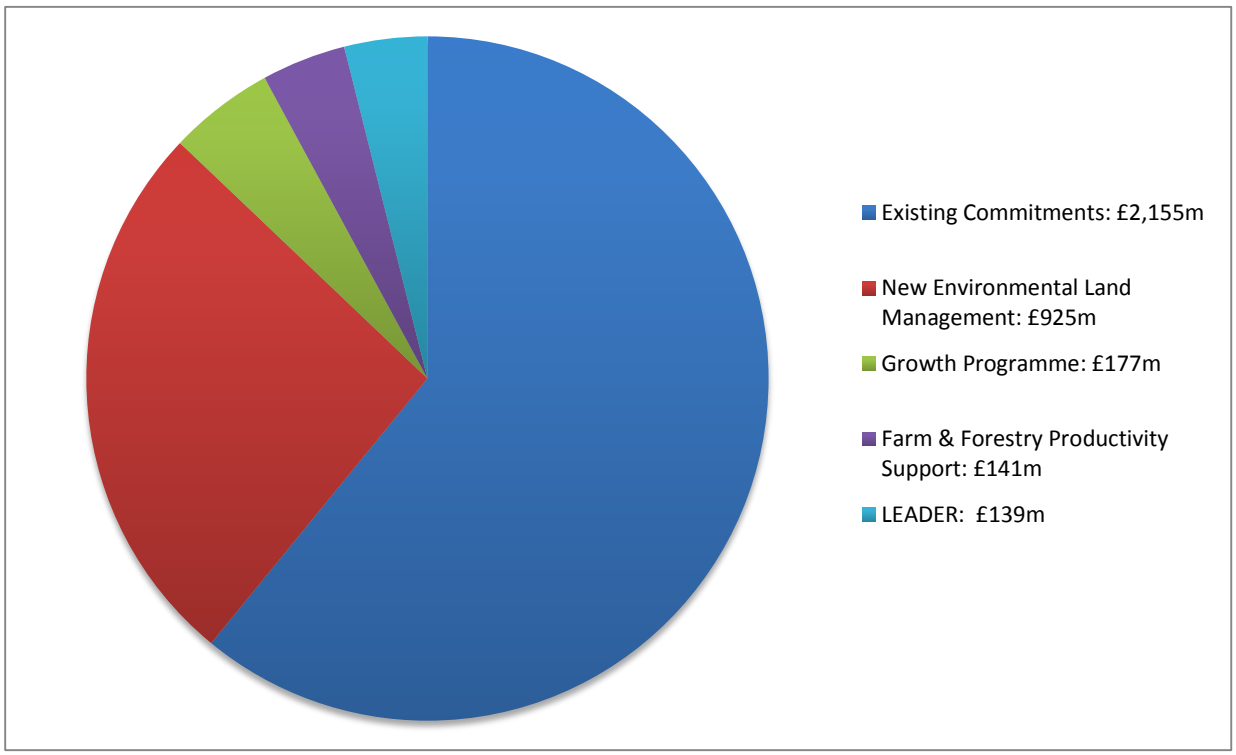
Approximately 4% of the next programme will be spent on farming and forestry productivity support which will impact on farm business performance through, for example, helping farmers innovate and take up technology, and encouraging cooperation and knowledge transfer.

The next programme will have a stronger focus on job creation and growth in rural areas, with 5% of the next programme being made directly available to Local Enterprise Partnerships (LEPs). Through their investment strategies LEPs will allocate spending based on local need in four key areas: building knowledge and skills, supporting micro and small rural business, investing in small scale renewables and broadband investments and supporting tourism activities. Funding for LEADER will be approximately 4% of the next programme in line with the EU requirement and will similarly have a strong focus on rural growth and job creation.

[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267987/cap-reform-sum-resp-201312.pdf

[4] Note that some expenditure under the current programme is continuing to take place during a transition phase in 2014; hence we still refer here to RDPE as the 'current' programme. This expenditure is included in total budget figures for 2014-2020 quoted in this document.

***Chart 1:*** *Allocation of Spending Under the Preferred Option (£m, Nominal)*




The baseline option expenditure is denoted by existing commitments in dark blue in chart 1 plus an element to enable LEADER to make up 5% of EU funds. The costs and benefits of the next programme over this baseline measured in this Impact Assessment are therefore the costs and benefits associated with the New Environmental Land management scheme, LEADER, the Growth Programme and farm and forestry productivity support which account for approximately 40% of the total Rural Development Programme budget.

## 1.1 Conclusions

The cost benefit analysis in this assessment suggests that the baseline option (when assessed against a hypothetical counterfactual of no Rural Development Programme activity after 2013) and the preferred option (in incremental terms with respect to the baseline option) both have positive net benefits. It is therefore worthwhile to have a Rural Development Programme and, indeed, to go beyond the minimum legal requirement. Table 2 shows the baseline option and the benefits and costs associated with it.

***Table 2:*** *Summary of Cost Benefit Analysis Baseline Option 0 (£m, 2012/13 prices)*[5]

| Option | Present value benefits | Present value costs | Benefit cost ratio | Net present value |
|---|---|---|---|---|
| **Baseline Option** | 7,295 | 2,208 | 3.30 | 5,087 |

Note: Costs and benefits estimated with reference to a hypothetical scenario where any Rural Development Programme Activity stopped at the end of 2013)

[5] Rounding accounts for the difference between present value benefits minus present value costs and the net present value.

Table 3 below shows the benefits and costs of the preferred option that are incurred over and above the baseline option. [6] Thus the preferred option has benefits of approximately £2.5bn in addition to £5.1bn of benefits accrued in the baseline option, with every £1 of additional investment estimated to generate £2.70 of additional benefit. The net present value (NPV) of the next Rural Development Programme, which combines the baseline and preferred option NPV, is estimated to be £7.6bn.

***Table 3:*** *Summary of Cost Benefit Analysis Preferred Option (£m, 2012/13 prices)*

| Option | Present value benefits | Present value costs | Benefit cost ratio | Net present value |
|---|---|---|---|---|
| **Baseline Option** | 4,012 | 1,529 | 2.62 | 2,482 |

Note: Incremental costs and benefits, over and above the costs and benefits of Option 0 set out above.

Under the baseline option, ongoing legal and international commitments would be placed at risk, leaving the UK exposed to an increased risk of infraction proceedings from the European Commission. This has not been factored into calculations of benefit cost ratios.

While the baseline option has a higher benefit to cost ratio than the preferred option, the preferred option would leave the Rural Development Programme better placed to meet the challenge set by Natural Environment White Paper and the Lawton Review. The ambitions of Biodiversity 2020 would also be more achievable and the Programme would be better placed to reverse the decline in farmland biodiversity, and meet legal requirements of the Habitats, Birds and Water Framework Directives. Wider policy outcomes for climate change, landscape and the Historic Environment would also be achieved. In addition, the preferred option significantly increases the potential for the Rural Development Programme to support economic growth in rural areas, and increase farm performance, in terms of productivity, efficiency and resilience.

Wherever possible, information about costs and benefits of both options has been monetised in line with Impact Assessment and HM Treasury Green Book guidance, reflecting a combination of market and non-market values. However, the robustness of monetary estimates of benefits varies across the different schemes depending on the quality of the evidence available.

### 1.2 Key Findings: Monetised Impacts

Due to the conservative approach adopted, benefit cost ratios will generally underestimate the total benefit of the options analysed in this Impact Assessment. The key findings are as follows:

- The benefit cost ratio for the preferred option is positive, suggesting that there is a net benefit in having a RDPE and in going beyond the minimum legal requirement.
- All the potential areas of focus in the Rural Development Programme could deliver net benefits in principle, providing that activities are properly targeted and address clearly identified market failures.
- Sensitivity analysis suggests that changing the spending allocations within the Growth Programme, LEADER and NELMS programme areas has a limited impact on the total expected

[6] The option estimates have each been adjusted to take account of the agriculture producer loss resulting from a 12% transfer of funding from Pillar 1 to Pillar 2 resulting in a £100 million present value cost. The baseline option assumes a zero per cent transfer for the purposes of the incremental analysis, which is consistent with the Rural Development Programme Consultation Impact Assessment.

net benefits of the next Rural Development Programme.[7] This is true even when directing spend to activities within programme areas which represent the highest value for money within the basket of all programme interventions.

### 1.3 Key Findings: Non-Monetised Benefits

The main categories of non-monetised benefits identified include:

- Possible benefits in relation to improvement of the historical environment and archaeological sites.
- Benefits in terms of maintaining and improving historical heritage and landscape character.
- Broader benefits from woodland creation and woodland management beyond the monetised benefits of biodiversity/landscape improvement, carbon storage and employment. These broader benefits (e.g. recreational access, increased habitat connectivity; flood prevention) are contingent upon geographical location. Broader socio-economic benefits associated with socio-economic interventions targeting rural communities, for example in relation to improvement of basic services and community renewal.

[7] Sensitivity Analysis was not carried out for farm and forestry productivity support because it uses a standardized benefit cost ratio across the whole of the programme. For more information see Section 11.

## 2. Problem under consideration

This IA sets out the evidence that demonstrates that the Rural Development Programme delivers value for money over the seven year period from 2014 to 2020.[8]

The EU Agricultural Council in June reached political agreement on the new Common Agricultural Policy Reform regulations for the period 2014 to 2020, following two years of negotiations. The council of EU Agriculture Ministers formally adopted 4 Basic Regulations for the reformed CAP as well as Transition Rules for 2014. In November 2013, UK CAP allocations were confirmed with the UK budget for Pillar 1 and Pillar 2 of €27.6bn. Following extensive consultation with devolved administrations, the Government concluded that the change in CAP funding for the seven year programme will be shared equally between the four UK administrations. England will receive a pillar 1 (direct payment) allocation of €16,421 million, and a pillar 2 nominal allocation of around €1,520 million. The EU pillar 2 allocation is part of the total RDPE budget, which also includes exchequer matched funding and funding from the inter-pillar transfer. Annex A sets out the composition of the total Rural Development Programme budget for 2014-2020.

The next programme is a major opportunity for the UK Government to invest in both the rural economy and the environment in England. It will be integral to fulfilling important aims and commitments leading up to 2020, building on the achievements of the current programme in a more targeted way to secure optimum impact and long term strategic gains within the available budget. In December 2013, the Government decided to transfer 12% from Pillar 1 to Pillar 2 in England with an increased environment focus and review in 2016 the demand for agri-environment schemes and the competitiveness of English agriculture.

The Government's ambitions for the new Rural Development Programme are:

a) promoting strong rural economic growth;

b) improving the environment: this includes helping to ensure that by 2021 the natural environment is improved as set out in the Natural Environment White Paper[9]; and

c) increasing the productivity and efficiency of farm and forestry businesses, in order to improve their competitiveness and reduce the reliance of farmers and land managers on subsidies.

The new Rural Development Regulation outlines six priorities (with focus areas under them) for the EU on rural development, of which Member States must aim to meet at least four. The six priorities are:

1) fostering knowledge transfer and innovation in agriculture, forestry, and rural areas;

2) enhancing farm viability and competitiveness of all types of agriculture in all regions and promoting innovative farm technologies;

3) promoting food chain organisation, animal welfare and risk management in agriculture;

4) restoring, preserving and enhancing ecosystems related to agriculture and forestry;

5) promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors; and

6) promoting social inclusion poverty reduction and economic development in rural areas.

[8] The Government is obliged under the new Common Agricultural Policy to have a new Rural Development Programme in England up to 2020. The EU rules allow flexibility to design and implement a programme to best suit the domestic needs and opportunities for rural England

[9] https://www.gov.uk/government/news/natural-environment-white-paper-discussion-document-record-response

Under the regulation Member States must also consider the cross-cutting objectives of climate change adaptation and mitigation which includes flooding, innovation and the environment.

## 3. Proportionate analysis

This section outlines the evidence that has been drawn on to analyse the impact of the baseline and preferred options.

### 3.1 Basis of evidence

Costs and benefits are derived wherever possible from evidence on the scale, duration and potential distributional impacts of the current RDPE (2007 to 2013). These costs and benefits are monetised, as far as possible. Where this is not possible, qualitative discussion and relevant indicators of costs and benefits are included. The quantitative analysis used is in the form of benefit cost ratio estimates based on internal analysis as well as research commissioned by Defra and other government departments.

The evidence base will be strengthened when the ex-post evaluation of the current Rural Development Programme for England is completed towards the end of 2015. In addition, enhanced annual reports of the next Rural Development Programme in 2017 and 2019 are a requirement of the EU and this will provide evidence to inform a post-implementation review.

The analysis of the monetised benefits of current RDPE projects is based on a number of evaluation sources. Primary sources include: administrative data held on the RDPE Online Database, used to derive estimates of gross value added from number of jobs created by different programmes; a mid-term evaluation report by ADAS-Hyder; an Impact Assessment of LEADER; and a body of evaluation evidence for agri-environment schemes. Details of how these sources are used to derive benefit cost ratios for each option are provided in Section 11.

**Box 1: The 2007-2013 Rural Development Programme for England (RDPE)**

The current programme aims to safeguard and enhance the rural environment (with Environmental Stewardship – a scheme which pays farmers and other land managers to deliver effective environmental management on their land – a major component of the programme), improve the competitiveness of the agricultural and forestry sectors and foster competitive and sustainable rural businesses and thriving rural communities. It operates across three main Axes:

**Axis 1** improving competitiveness of the agricultural and forestry sector;

**Axis 2** improving the environment and the countryside; and

**Axis 3** improving quality of life in rural areas and helping the diversification of the rural economy.

A small proportion is delivered through applying the LEADER approach which is a community development model for rural areas, which is often referred to as **Axis 4**.

The total nominal budget for the current programme is £3.8 billion, which is made up of around £2.6 billion of EU funding and £1.2 billion of UK Exchequer funding. The balance of funding is calculated from the co-financing rates of the EU funds and the amount spent under each Axis. In England, 9% of Pillar 1 funds were voluntarily transferred to Pillar 2 for 2013. The rate of transfer during the current programme varied between 9% and 14%.

An ex-post evaluation is due to be completed by the end of 2014 which is expected to provide further evidence on the current programme.

**Box 2: LEADER: Axis 4**

The LEADER approach is a delivery mechanism under the Rural Development Programme. It uses local knowledge to promote an integrated "bottom up", community-led delivery of Rural Development Programme funding. It is delivered through Local Action Groups and is targeted to rural areas and to their local needs or priorities. The rationale for this is the view that LEADER offers an added value compared with traditional top-down implementation. These benefits accrue through mobilisation of local potential, identification of local problems and increased responsiveness.

### 3.2 Evidence quality

There are significant uncertainties with estimates of benefits and benefit to cost ratios. Our level of confidence varies across different programme areas. Specifically:

- The overall evaluation evidence on the benefits of **environmental land management and agri-environment schemes** is good, drawing on a Food and Environment Research Agency (FERA) Report[10] in terms of wildlife benefits of agri-environment complemented by additional internal analysis drawn from variety of published sources (e.g. in terms of carbon, air and water impacts valuation);

- The confidence that should be placed on monetised estimates of the benefits of **forest creation and management** is at best moderate. We can estimate and value carbon benefits reasonably well using established methodologies (i.e. Woodland Carbon Code and Department of Energy and Climate Change (DECC) values of carbon). The same applies to wood fuel benefits. However, in valuing the benefits in terms of landscape/biodiversity we have to rely on proxies and old valuation evidence;

- The available evidence on the benefits of **farm and forestry productivity** activities in the current RDPE is limited. The estimates presented in this Impact Assessment should be regarded as illustrative. They are taken from a report by CCRI for Defra and rely on a financial proxy approach to derive an overall Social Return on Investment (SROI). This reflects interviews with a small sample of beneficiaries and non-beneficiaries. The CCRI report has also provided qualitative process evaluation to inform how programme delivery can be improved;

- Monetary estimates of the benefits of the **Growth Programme** have been developed internally by Defra analysts relying on a variety of evaluation and appraisal sources. They vary in robustness and are sometimes illustrative or preliminary (e.g. renewable energy interventions). The most robust estimates in this area reflect evaluation of interventions focused on job creation, relying on monitoring data from the RDPE Online Database. The next Rural Development Programme will deliver these interventions through Local Enterprise Partnerships (LEPs). This is an entirely new approach to joining up RDP spending with that from other EU and domestic schemes, with the intention of achieving better co-ordination between them and economies of scope and scale. However, as any such benefits will only be realised in the new programme, the benefits assessment cautiously assumes no improvement upon those achieved by the current programme; and

[10] Available at: http://archive.defra.gov.uk/evidence/economics/foodfarm/reports/documents/estimatingthewildlife.pdf

- The monetised estimates for benefits of **LEADER** interventions are taken from a recent report by Ekosgen for Defra. The report reflects a thorough methodology but there is uncertainty as to representativeness of the sample compared with the current LEADER programme.

There have been a number of improvements to the evidence base since the consultation Impact Assessment which are now included in this assessment. This is particularly the case for the Growth Programme with improved estimates of the benefits from interventions in rural broadband and tourism. Updates in the scheme design for the Growth Programme have also meant the analysis is more reflective of what and how the next programme will be delivered.

We have commissioned a new nationally representative survey of RDPE beneficiaries for Axis 1 and 3, which will develop the method employed in the CCRI study further. This is expected to report in autumn 2014 and will improve the evidence base for Growth Programme and Farm and Forestry Productivity support interventions.

# 4. Rationale for intervention

## 4.1 Introduction

This section sets out the rationale for government intervention that underpins the next RDPE (2014 to 2020), looking in turn at legal obligations, market failures, and wider government objectives.

## 4.2 Legal obligations

Article 7 of the new Rural Development Regulation outlines the legal requirement for England to have a new Rural Development Programme up to 2020. The regulation sets out the broad priorities, cross-cutting themes and the measures to be used in the programme. It requires Member States to spend at least 30% of their EU rural development funding on environmental land management measures and at least 5% on LEADER projects.[11] The Government is thus required to have at least this level of programme.

In addition to the legal obligation to have a minimum Rural Development Programme, contractual obligations from existing multi-annual agreements (agri-environment and forestry) entered into during the current programme (or transition period up until 2015) also need to be met. These existing obligations will consume £2.16 billion of the budget from the new programme. This will amount to around 61% under the preferred option. Managing these agreements to completion will require continued resources from Natural England.

Various other government legal obligations, such as the Birds, Habitats and Water Framework Directives can also be supported through interventions in the new Rural Development Programme. Many of the obligations are inter-connected, for example meeting water quality standards has positive impacts on biodiversity, benefiting birds as well as habitats. Other obligations include the Ramsar Convention, Wildlife and Countryside Act (Sites of Special Scientific Interest, SSSIs) and Convention on Biological Diversity.

## 4.3 Market failures

There are a wide range of market failures in the rural economy which limit private sector investment in environmental services and infrastructure. A market failure occurs when the market does not allocate resources to generate the greatest social welfare. Common forms of market failure include externalities and the presence of public goods (i.e. of goods which are non-excludable and non-rival).[12] These will typically introduce a divergence between the optimal provision of relevant goods and services and what the market is prepared to deliver at prevailing market prices.

For the Rural Development Programme the overarching market failure is the presence of environmental externalities (both positive and negative), associated with land-based activities. However, market failures can also limit take up of new technologies, the development of skills and generally hold back the performance of the rural economy. The programme seeks to address these market failures by encouraging land managers to invest more in the provision of environmental (or ecosystem) services and by promoting investments in technology, skills and infrastructure.

[11] This equates to 4% of the total RDPE budget after national co-financing is taking into account.

[12] In an economic sense public goods are goods that are non-excludable and non-rival. A good is non-rival if the consumption by one person does not diminish the ability of others to consume it. A good is non-excludable if a person cannot be excluded from consuming that good. Public goods that exhibit both characteristics (e.g. a pleasant rural landscape) are pure public goods.

The following sub-sections look at relevant market failures as they relate to the environment, farm and forestry productivity and rural growth objectives of the next programme.

### Environment

There are two principal market failures which can be addressed through agri-environment and forestry schemes within the new Rural Development Programme: the provision of public goods (such as landscape amenity or a thriving wildlife), and the mitigation of negative environmental impacts associated with land management activities (farming and forestry).

Since the 1940s English farming has been successful at responding to the drive to increase food production, through a combination of agricultural technology advances (enabling mechanisation and intensification), and steered by a combination of government policies and market forces.

The shift towards more intensive agriculture and timber production has increased the risk of environmental pollution and has often compromised other important benefits that we receive from the countryside, with financial as well as environmental implications.

For example, the total annual cost of water pollution to river and wetland ecosystems and natural habitats in England and Wales is estimated to lie between £716 and £1,297million. These estimates do not cover the substantial costs to water companies to remove the pollutants to meet drinking water quality standards. Within the programme, improvements in water quality will be targeted by environmental land management and Farm and Forestry productivity schemes.

Trends showing long-term declines in the wider public benefits from the countryside such as clean air, productive soils, clean water and biodiversity (sometimes referred to as ecosystem services), have been highlighted by the National Ecosystem Assessment.[13] This also notes that over 40% of priority habitats and 30% of priority species are in decline. Many others are in a reduced or degraded state, including wild species diversity and some of the services provided by soils.

There are plenty of good examples of where well managed agriculture and forestry can successfully provide a wide range of non-market benefits in addition to the core business of food or wood and timber production. It's not a question of production versus environment, but of restoring the right balance in the right places. For example well managed woodland can provide benefits of carbon storage and flood alleviation, along with opportunities for outdoor recreation. The importance of these benefits has been highlighted by the National Ecosystem Assessment and more recently, the report by the Independent Panel on Forestry.

Rural Development Programme measures such as agri-environment and forestry schemes, building on regulation and industry led good practice, can help land managers reduce the pressure they place on the natural environment, help restore the natural environment and realise the broader non-market benefits that society needs. The primary market failure in forestry relates to the lack of a monetary reward for the public goods associated with woodland management. Lack of forestry expertise, lack of practical skills and poorly developed supply chains (e.g. for hardwood) add to the problem and result in a suboptimal level of active woodland management. By bringing more woodland into active management public benefits such as biodiversity enhancements are produced alongside private benefits (timber / woodfuel).

### Farm and forestry productivity

[13] Available at: http://uknea.unep-wcmc.org/

The Rural Development Programme provides a method for addressing a range of barriers and market failures in the farm and forestry sectors, specifically in relation to investment in new technology, skills, infrastructure, information and advice.

Innovation is one of the key drivers of productivity growth in agricultural and forestry businesses, alongside up-skilling and cost reductions as a result of economies of scale[14]. However the full benefits of research and development investments typically exceed the returns for individual businesses (for example, over time they extend to competitors as workers move on and expertise gets disseminated more broadly). There is generally a role for government in funding public research and development programmes. In the agricultural sector, UK productivity has been in decline relative to its major trading partners for the past three decades, and there is evidence that a lack of expenditure on public research and development is one of the causes for this[15]. The UK Agricultural Technologies Strategy aims to address this, through an additional £160 million match-funded spend on applied and translational research and infrastructure, amongst other measures[16].

Further market failures may prevent the spread of innovation from 'early adopters' through the farming and forestry industry, for example if there are barriers to the transmission of information about the benefits of new technologies and processes, or if farmers' or forest managers' isolation from other innovative businesses prevents them from taking up collaborative opportunities. However, it should be noted that there is also 'government failure' in this area, whereby existing subsidies retain low performing businesses in the market, blunting the incentive for these land managers to adopt the successful innovations of the top performers.

Skills levels and knowledge among staff are also key to generate and adopt new innovations, but once again individual firms are unlikely to capture the full benefits of investing in educating and training a mobile workforce. This can once again provide a rationale for government to support investment in education and skills of workers across the economy, including in the land management sectors. However, as elsewhere, this must be weighed against the risk of 'crowding out' private sector activity in the market for knowledge.

Government intervention to promote animal health and welfare helps to improve productivity by reducing losses due to illness and mortality. It can also be justified because both people and other animals benefit from disease free, healthy livestock beyond the private benefit which profit maximising farmers would reap in investing in the health and welfare of their herd. Conversely, through the spread of disease, other animals and people can suffer the negative effects of underinvestment by an individual farmer. As such public welfare can be improved if the Government intervenes to promote animal health and welfare beyond the free market level.

### Rural growth

Despite the relatively strong economic performance of rural areas as a whole, the Rural Economy Growth Review identified a remaining gap in productivity between rural and urban areas. One of the fundamental differences is that rural areas tend to be more distant from concentrated economic activity and the associated productivity benefits (or agglomeration economies) for businesses. These benefits include knowledge transfer, labour markets where demand for and supply of skilled labour is high, and access to supplier and customer markets. A consequence of being at distance from agglomeration is

[14] OECD (2011), Fostering Productivity and Competitiveness in Agriculture, OECD Publishing. *http://dx.doi.org/10.1787/9789264166820-en*
[15] Thirtle and Holding (2003) Productivity and Competitiveness of UK Agriculture, Causes and Constraints
[16] https://www.gov.uk/government/publications/uk-agricultural-technologies-strategy

that knowledge transfer is weaker, labour and skills are more sparsely spread, and upstream and downstream markets are more difficult to access.

Investment in infrastructure (such as accessibility to broadband internet connection) can increase agglomeration economies for rural businesses to a level that is comparable to that enjoyed by businesses located in more densely populated areas. However, positive externalities from agglomeration are not factored into market decisions, so there is a case in principle for government support.

Specific market failures can also act as barriers to growth sectors of rural development such as tourism. For example individual hotels or other tourism businesses have an incentive to free ride on co-ordinated efforts to invest in marketing a destination (town, region or country) as opposed to their own business. As a consequence, left to their own devices individual businesses would underinvest in this kind of destination marketing activities. By contrast, support from destination management organisations can enable better coordination of marketing activity (alongside product development) to advertise what a local area offers and attract more visitors, bringing benefits to the wider rural economy.

## 4.4 Government policy objectives

### Defra policy aims and commitments

Defra priorities are to grow the rural economy, improve the environment and safeguard animal and plant health. RDPE funding can potentially be used to help meet a number of government policy commitments including those made in Biodiversity 2020; the Natural Environment White Paper (NEWP); the Lawton Report; government Forestry and Woodlands Policy Statement, January 2013; The Forestry Skills Action Plan; European Landscape Convention; Uplands Policy Review, 2011; Farm Regulation Task Force, 2011; Water White Paper; and the National Ecosystem Assessment. The Rural Development Programme can also play a role in supporting the Government's statement on the Historic Environment for England.

### Other government policy objectives

The Government has committed to deliver a proportion of rural development funding via the EU Structural and Investment Funds Growth Programme to support general rural growth. This will incorporate the European Regional Development Fund (ERDF), the European Social Fund (ESF) and some funds from the Rural Development Programme. Further information on the EU Structural and Investment Funds Growth Programme is available in Defra's status report on the new Rural Development Programme of 12 August 2013[17] and guidance issued to Local Enterprise Partnerships.[18] The Government's objectives for the next RDPE are outlined in section 2 along with the 6 priorities in the Rural Development Regulation as set out by the EU.

### Needs assessment of rural England

The various drivers outlined above provide rationale for the RDPE, but further evidence about what should (and what should not), fall in scope has been considered. Opportunities to provide public goods, address specific market failure issues and tackle barriers to growth only where it falls to the Government

[17] Status report available at: https://www.gov.uk/Government/publications/cap-reform-in-england-status-report-on-the-new-rural-development-programme.

[18] Local Enterprise Partnership guidance available at: https://www.gov.uk/Government/publications/european-structural-and-investment-funds-strategies-supplementary-guidance-to-local-enterprise-partnerships

to intervene are identified in the Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis. The detailed SWOT analysis is provided in the RDPE Programme Document.

# 5. Scope of new programme

In December 2013 the Government decided to transfer 12% from Pillar 1 to Pillar 2 of the CAP with an increased focus on supporting environmental improvements. There will be a review in 2016 of the demand for agri-environment schemes and the competitiveness of English agriculture, with a view to increasing the level of transfer to 15% in the final two years of the programme. Although rural development programme scheme design has advanced since the consultation stage impact assessment there is still a degree of uncertainty over the exact type of activities that the next Rural Development Programme will deliver, especially in the Growth Programme and LEADER which employ a bottom up approach to delivery. In January 2014 the Local Enterprise Partnerships (LEPs) submitted their draft European Structural Investment Plans which provide a high-level indication of the types of activities they plan to invest in for rural growth. These will be developed up to May 2014.

In developing the options for the proportional balance of spend, we make a number of assumptions about what the next programme will fund. Wherever possible this is based on best available data and current scheme design as set out in the latest draft of the Programme Document. The broad areas are: environmental land management; farm and forestry productivity support; rural growth; and LEADER. Additional areas that cut across these are: innovation; skills and advice; and water.

## 5.1 Environmental land management

Biodiversity will be the primary focus of the New Environmental Land Management scheme. The environmental land management measures in the next Rural Development Programme will be the primary source of government funding over the next seven years to help secure delivery of environmental objectives on agricultural land, including the England Biodiversity Strategy 2020 targets, delivering the Lawton vision of better, bigger and more connected habitats and engaging people with the natural environment. The new environmental land management scheme will be more targeted and will bring together a number of existing schemes into one scheme, building on and enhancing the current Environmental Stewardship (ES) and the English Woodland Grant Scheme (EWGS). It will also incorporate grants relating to Catchment Sensitive Farming. Taken together these environmental schemes will account for around 87% of the programme. The primary focus will be biodiversity. Water will also be a key objective, with multiple objectives delivered where possible.

## 5.2 Farm and forestry productivity support

Rural Development Programme support for farm and forestry productivity will help drive long-term productivity improvements by focussing expenditure on improving:

- the rate of innovation, technology diffusion, and knowledge exchange;
- business competitiveness and supply chain relationships;
- resource efficiency and management; and
- animal health and welfare;

The programme will build on the lessons learned from the current Farming and Forestry Improvement Scheme [FFIS], Rural Economy Grant [REG] scheme and national Skills Framework, but will place more emphasis on supporting innovation and delivering clear growth and productivity improvements targeted in the farming and forestry sectors. The programme will tie productivity improvements to solving environmental externalities such as diffuse water pollution or air quality issues.

Support will focus on the following key areas:

- Innovation, technology diffusion and knowledge transfer, by creating the right conditions for the development and translation of new technologies and practices within the farming and forestry sectors. This will help drive long-term productivity.

- Farm competitiveness and supply chain relationships, by supporting farmers to improve their competitiveness and as a result reduce their dependency on subsidies. It will increase the take up of effective business practices, improve awareness of local and national supply chains and marketing opportunities to enable farmers to increase their responsiveness to, and success in the market place. It will also offer support to those new entrants who are in the early years of building their farm businesses.

- Woodland Enterprise and Supply Chain, by addressing the lack of active woodland management through supporting market based actions that will reduce dependency on government intervention and support wider rural growth and stimulate the supply of woodfuel.

- Resource efficiency and management by supporting an improvement in the ratio of farm key inputs such as fertiliser, energy and water, to outputs through targeting beneficial infrastructure, technology, practices and knowledge exchange mechanisms.

- Animal health and welfare with a particular emphasis on tackling endemic animal disease, through better risk management, animal husbandry and training. It will support improved knowledge transfer and increased awareness in relation to for example biosecurity measures.

### 5.3 Rural growth and communities

General rural growth funding will be directed through the European Structural Investment (SI) Funds Growth Programme, with Local Enterprise Partnerships' (LEPs) investment strategies setting out how it should be spent. A Partnership Agreement will set out, at UK level, how all relevant EU funds will be allocated and managed to deliver national priorities.

The Government believes that growth will be most successfully delivered by identifying gaps and barriers at a local level; and by involving local partners in defining actions needed to overcome them. Development and delivery of the SI Fund Growth Programme will therefore be informed by the SI Funds Investment strategies that the 39 Local Enterprise Partnerships in England are currently drawing up in alignment with their wider Strategic Economic Plans. Defra received the second draft of LEPs' SI funds plans in January 2014 and will agree final strategies by mid June 2014.

Defra has allocated 5% of the total Rural Development funding available in 2014-2020 to contribute to the SI Funds Growth Programme delivered through LEPs. This funding will be available to support local activity in four priority areas:

- Support for micro and small businesses;
- Knowledge and skills;
- Rural broadband and small-scale renewables; and
- Tourism.

The fund has been pre-allocated to LEP areas on the basis of need, mostly by rural population but also other factors such as population density and the productivity of the LEP area. Taking a bottom-up approach, Defra will work to develop national schemes for each of the priority areas in response to locally-determined demand. The intention is that schemes will offer a mix of grant funding and commissioned support, with the balance of these elements to be determined.

## 5.4 LEADER

The bottom-up, community led LEADER approach, will have a much greater focus on job creation and growth in rural areas. LEADER spending equates to 5% of EU funding which is a legal requirement. This equates to 4% of the total Rural Development Programme for 2014-2020, which includes EU funding, exchequer matched funding and inter-pillar transfer funding (See Annex A for more detail). LEADER is founded on a principle of delegating powers of strategy and decision making to the local level through Local Action Groups (LAGs). LEADER will also work alongside the Growth Programme.

In terms of the overall balance of expenditure for LEADER, we envisage that nationally 70% of all projects must directly support the rural economy. This could for example be through creating and developing small and medium sized rural businesses. The remaining 30% of projects must also demonstrate that they too are making a contribution to improving the local rural economy, by, for example projects which increase visitors to a particular area thereby increasing spend on local rural business and services. The main priorities for investment through LEADER will be:

- Support for micro and small enterprises and farm diversification;
- Support for increasing farm productivity;
- Support for rural tourism;
- Support for increasing forestry productivity;
- Provision of rural services; and
- Support for cultural and heritage activity.

# 6. Assumptions in analysing the options

## 6.1 Rural Development Programme budgets

To access the potential impact of the options we use the figures in table 4 for the overall Rural Development Programme budget. These are in nominal terms. Annex A sets out the assumptions that underpin the budget options.

***Table 4:*** *Total Budget for the New Rural Development Programme (£m, nominal)*

| RDPE Total Budget | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Total |
|---|---|---|---|---|---|---|---|---|
| **Preferred Option** | 496 | 507 | 506 | 507 | 507 | 507 | 507 | **3,537** |

Rural Development Programme budgets and spending are set in nominal terms. This means that over time the purchasing power of programme budget is eroded by inflation. In the modelling we therefore assume that spending declines in real terms over the new programme. As benefits are produced from spending, which declines in real terms, the associated benefits also decline over time. However, administration and delivery costs do not fall in real terms. As discussed later in Section 9, we assume that delivery administration costs fall by 30% in the next RDPE. We use the latest HMT Gross Domestic Product deflator with a future inflation assumption of 1.7% beyond 2018.

## 6.2 Intervention rates

Private contributions from beneficiaries to Rural Development Programme projects are included as costs in the analysis of benefits and costs for the preferred option. Estimates of private contributions are made using evidence on 'intervention rates' from Defra databases and other consultancy work. By intervention rates we refer throughout the document to the amount of government subsidy as a proportion of overall investment, with the overall investment including both government funding and private contributions. Table 5 shows the intervention rates for the different schemes in the programme.

***Table 5:*** *Intervention Rates for RDPE Schemes*

| Programme | Intervention Rate | Evidence |
|---|---|---|
| Agri-Environment | 100% | There are no private contributions for agri-environment schemes. |
| Farm & Forestry Productivity Support | 59% | Based on a weighted average across measure level data from the RDPE online database to January 2014 |
| Growth Programme | 64% | Based on a weighted average across measure level data from the RDPE online database to January 2014. |
| LEADER | 36% | Based on the LEADER impact assessment by Consultants EKOS |

For the purpose of the modelling, the intervention rates have been based on activity in the current RDPE and should be viewed as indicative for the 2014-2020 programme. They may be different in the next programme especially for farm and forestry productivity support where the new programme focuses on different activities from the previous programme.

### 6.3 Allocation of Spending

For the purposes of estimating benefits, we assume in the modelling that:

- **Agri-Environment** - We assume that around 45% of new environmental land management expenditure is allocated to upper tier, 40% is allocated to middle tier, 10% to forestry and 5% to capital items. These assumptions are indicative only. Spending on woodland creation and woodland management, as well as other forestry interventions, is included in environmental land management.
- **Forestry -** Based on relative spending in the current RPDE we assume that 61% of spending on forestry is directed at forestry creation and the remaining 39% is directed at forestry management. These estimates come from the Forestry Commission.
- **Growth –** Based on returns from the first draft of LEPs' draft Structural Investment Fund strategies 11% of spend will support investment in small scale renewable energy infrastructure; 10% will support investment in Broadband; 11% will support tourism activities; 48% will support SME creation and development and; 20% will support training and skills development. These allocations will change as LEPs develop their strategies. [19]
- **LEADER** - The next LEADER programme will have a strong focus on supporting business. 70% of the budget will support growth directly with the remaining 30% supporting it indirectly. This allocation has been provisionally agreed by ministers, although there is a degree of uncertainty given the Local Action Groups will not submit their investment strategies until September 2014.

### 6.4 Loans

For some activities, the new programme may make use of loans or other financial instruments in place of the grants that have been used in the current and previous programmes. The exact details of which activities may use these and the extent to which they may be used are yet to be confirmed within the new programme's scheme design. However, we are aware that a number of the LEPs have included provision for developing loan funding mechanisms within their plans for growth and so may develop their own schemes to implement this type of mechanism. For the purposes of this Impact Assessment we assume that 10% of the funds allocated to the Growth Programme are distributed in the form of loans, which is realistic given the type of activities the Growth Programme will fund.

There is limited evidence of market failures in terms of access to finance for Growth Programme activities and the majority of activities (e.g. training) would not be suitable for delivery through a loans mechanism. We have also had informal discussions with a number of banks about the extent of market failure in loan provision to agricultural producers, in context of the farm productivity schemes, for which the main group that may benefit from access to loans is new entrants to the farming sector that lack assets or capital. Defra ministers have agreed that we should continue to examine the potential of the use of loans in the next Rural Development Programme.

The use of favourable terms loans or other financial instruments could impact the benefits and costs of the Rural Development Programme. By targeting credit restrictions and/or closing the gap between privately and socially attractive returns on investment, loans may help deliver programme objectives while reducing the level of deadweight that can be associated with capital grants, especially where these

[19] Since the time of writing this Impact Assessment, Defra has received a second draft of the LEP ESIF strategies. These now indicate a split of 20% for small scale renewable and broadband investments; 16% for tourism support; 19% for building knowledge and skills in rural areas and; 45% for new and developing micro, small and medium sized enterprises. This is likely to have an immaterial impact on the benefit cost ratio for the Growth Programme.

cover a large share of the investment. On the other hand they may result in higher administration costs, particularly for revolving loans as repayments need to be collected annually. Favourable terms for loans are also unlikely to represent powerful incentives to invest where the returns to investment are predominantly public in nature (as even with zero interest loans the amount of the subsidy can cover at most the sole cost of interest payments).

The specific characteristics of how these loans may work are currently unclear. We make some indicative assumptions to model the impact of moving to loans. We assume these loans have a seven year payback period, with 5% nominal interest rate per year. We assume that all beneficiaries pay the money loaned to them back and we assume that all money paid back by beneficiaries is loaned out again to fund further projects under the Growth Programme. The money that is loaned back out accrues further benefits as it is essentially new Growth Programme spending.

We recognise the assumption on payback is quite extreme, but the additional benefits accrued from delivering the Growth Programme through loans over a traditional subsidy are sufficiently small that it does not merit sensitivity analysis. The impact on social welfare of reducing the repayment rate is likely to be small. Only £8m of additional Growth Programme spending is accrued over 2014-2020 as a result of loan repayments, and in the extreme case of a 0% payback rate, the overall Rural Development Programme net present value falls by £14m and the benefit cost ratio by only 0.01. The impact on the present value benefits of the Growth Programme is larger however.

# 7. Description of Options

This section sets out some of the detailed impacts of the baseline and preferred option assessed. It breaks down in detail the committed spending under option 0 and describes how this could impact on the new Rural Development Programme. Against this baseline, it compares spending in the preferred option and describes the expected impacts of the funding allocation.

## 7.1 Option 0 – Do minimum

Under this option we would not address the measures in the new Rural Development Regulation. Apart from the LEADER element, it represents running down the current RDPE over the life of the new Common Agricultural Policy, as the contractual obligations from the current programme fall each year. This option assumes that Pillar 1 of the Common Agricultural Policy still exists. Table 6 shows the legally committed spending in the next programme.

***Table 6:*** *Detailed Breakdown of Legally Committed Spending in Option 0 (£m, Nominal)*

| Figures in £m | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Total |
|---|---|---|---|---|---|---|---|---|
| **Forestry creation** | 31 | 20 | 15 | 12 | 10 | 8 | 6 | **102** |
| **Higher level stewardship** | 188 | 202 | 189 | 172 | 154 | 140 | 115 | **1,160** |
| **Entry level stewardship** | 165 | 163 | 116 | 79 | 58 | 48 | 39 | **668** |
| **Organic entry level stewardship** | 15 | 15 | 13 | 10 | 8 | 7 | 4 | **72** |
| **Uplands entry level stewardship** | 25 | 26 | 21 | 19 | 17 | 15 | 11 | **136** |
| **"Classic" Agreements** | 16 | 1 | 0 | 0 | 0 | 0 | 0 | **17** |
| **Total committed (legally binding)** | **440** | **428** | **354** | **292** | **247** | **218** | **176** | **2,155** |

### Environmental Stewardship

Under the baseline option there is no provision for new environmental land management agreements. Only the contractual commitments with existing agri-environment and forestry agreement holders would be met. Ongoing legal and international commitments would be placed at risk, leaving the UK exposed to an increased risk of infraction proceedings from the European Commission. It could also see a retreat from the progress which has been made after 20 years of investment in environmental measures, as agreement holders exit from their agreements with no prospect of entering a successor scheme. A significant decline in public goods provision might be expected, placing at risk the long term future of many natural assets and ecological services as land managers focus more on production and profit maximisation. There might be no further increase in woodland area and most management of priority woodlands would cease. The management that is undertaken without any support would probably continue, although even this may decline due to lack of investment in harvesting and extraction equipment through farm and forestry productivity support. The potential for greater regulation (for example enforcing statutory requirements on Sites of Special Scientific Interest), would increase.

The LEADER approach would deliver 5% of the EU funding component. This is calculated under option 0 at approximately £78 million. In terms of coverage, LEADER would have to reduce in size from the current extent – either through reducing the number of Local Action Groups, reducing individual budgets or reducing the length of the new programme.

## 7.2 Preferred Option Summary

The preferred option includes the £2.16 billion of contractual commitments as detailed in the baseline option above. The relative share of additional expenditure upon which the costs and benefits of the preferred option are assessed is shown in Table 7.

***Table 7:*** *Preferred Option Budget Allocations Excluding the Existing £2.155 Billion for Agri-environment (£m, Nominal)*

| Programme Area | Preferred Option (£m) |
|---|---|
| New Environmental Land Management | 925 |
| Farm & Forestry Productivity Support | 141 |
| Growth Programme | 177 |
| LEADER | 138 |
| Total | **1,381** |

### New environmental land management

The preferred option would involve spending on environmental land management in a higher proportion than the current programme. Compared with the baseline option the additional focus of spend would leave environmental land management schemes better placed to meet the challenge set by Natural Environment White Paper and the Lawton Review. The ambitions of Biodiversity 2020 would be more achievable and the new programme would be better placed to support Water Framework Directive and wider policy outcomes for climate change, landscape and the Historic Environment. This means it would be possible to extend the "reach" of the new scheme in terms of the area covered and expenditure for protected areas, priority habitats, and woodland management support. The scope for more landscape scale approaches (supporting the Lawton principles of bigger, better and those that are more connected) would be enhanced relative to the baseline option.

### Farm and forestry productivity

The preferred option would provide fewer resources for productivity support than in the current programme. Focus would therefore be placed on those activities which are proven key drivers of growth and improved productivity, such as innovation in business practice or technology, cooperation between businesses, development of technical skills to enable take up of new research and knowledge exchange. It would also be placed on those activities which have a clear rationale for public intervention, benefits to public goods as well as growth, or where access to finance in the private market is more difficult. The programme would also support projects which deliver multiple benefits, rather than trying to isolate budgets and attach them to specific objectives.

### Growth and rural communities

The preferred option would reduce the proportion of investment in support for rural growth. The new Growth Programme will deliver fewer, but more focused activities as set out in Section 5. Funds will be delivered through LEPs and will be more targeted to local needs than in the previous programme.

### LEADER

The LEADER approach would deliver 5% of the EU funding component, which equates to 4% of the total Rural Development Programme budget for 2014-2020. Under the preferred option the LEADER

approach would deliver about the same amount of funding as the current programme. LEADER could look to cover the full range of growth activities identified, as well as giving a specific focus to farm and forestry productivity and continued activity in support of rural communities.

### Overall growth-related activity across scenarios

Direct growth related activity under the new programme will include activities to support growth and rural communities, farm and forestry productivity and LEADER. In addition, environmental land management may deliver some indirect benefits for rural economic development, as studies such as the National Ecosystems Assessment (NEA) have shown. For example, the NEA demonstrated that our coastal wetlands can be valued at providing £1.5 billion annually in benefits through buffering the effects of storms and managing flooding. Total direct growth-related activity would represent 13% of total spending under the preferred option.

# 8. Methodology for options assessment

## 8.1 Introduction

The preferred option introduced in the previous section is assessed using a very wide range of evidence, resorting as much as possible to evaluation evidence from the current RDPE (2007 to 2013).

Sections 9-11 present more detail on the estimation of both benefits and costs for the purpose of option analysis. They also include reference to additional evidence (sometimes quantitative, sometimes qualitative), of the impacts of the current RDPE. While this has not been used for modelling purposes it helps provide a more complete picture of our understanding of the impacts of the next programme.

## 8.2 Costs Summary

The quantitative cost benefit analysis has considered the following categories of costs which are explained in greater detail in sections 9 and 10.

- **Business contributions:** Private leveraged spending from government investment.

- **Costs involved in transferring funds from Pillar 1 to Pillar 2:** Direct payments are decoupled from production in England (farmers 'payments do not depend on their level of production). This means that farmers claim the same direct payment whatever their level of production and direct payments should not, in theory, influence levels of production. However, evidence suggests that direct payments do continue to exert a small influence on production and can influence the decision by individual farmers to continue to operate a farm rather than exit the industry. As a result, a fall in direct payments does have some effect on aggregate production and so reducing the budget for Pillar 1 will have some impact on aggregate agricultural production. Modelling has been undertaken by FAPRI[20] to assess the impact of transferring different levels of funds from Pillar 1 to Pillar 2, although it has not been done for a 12% transfer level. Consistent with the conservative approach employed in this Impact Assessment, we use the figure for lost agricultural production of £100m in present value terms resulting from a 15% transfer level.

- **Delivery administration costs**: Costs to government of delivering the next RDPE;

- **Beneficiary administration costs and policy burden**: The opportunity cost to business both of applying for Rural Development Programme funding and of complying with monitoring and inspection.

## 8.3 Benefits Summary

The quantitative analysis of benefits has focused on a thorough review of evidence on the impacts of the current RDPE for different possible areas of intervention in the new programme. This is the case, for example, of agri-environment schemes, which represent the large majority of expenditure under both the options considered in this Impact Assessment. Where formal evaluation evidence was not available, other sources of evidence (both evaluation and appraisal evidence), or ad-hoc estimates based on proxies are developed. All the key sources and assumptions of monetised benefits are set out in Section 11.

[20] Sectoral Impact of Transferring Fund from CAP Pillar 1 to Pillar 2, 2013
http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=17569

This evidence is used to develop a number of benefit cost ratios (both ranges and best estimates), for the different programme areas in the next Rural Development Programme:

- Environmental land management;
- Farm and Forestry Productivity Support;
- Growth Programme activities; and
- LEADER activities.

Annexes B to E provide more detail of the methodology applied wherever benefit cost ratio estimates are developed by Defra analysis or involve significant adaptation of published estimates (as opposed to being simply taken and applied from published reports). There are significant uncertainties with estimates of benefits and benefit cost ratios. Our level of confidence varies across different programme areas, as described in section 3.

Given the significant uncertainties associated with estimates of benefits and benefit cost ratios, a sensitivity analysis is presented which takes higher and lower bound estimates of 'input' benefit cost ratios. The results are presented in section 13.

## 9. Delivery administration costs

We include an estimate of government's delivery costs in the analysis of the benefits and costs for both options in this Impact Assessment. This is based on current spend and ambitions for achieving efficiency by reducing future delivery costs.

Table 8 shows Rural Development Programme team (Defra) estimates of annual delivery costs for Defra and the other delivery bodies for a total programme budget associated with a 12% inter pillar transfer. These are based on the previous programme and reduced at the same proportion to total Rural Development Programme budget. IT costs are estimated by the Rural Development Programme team. The estimate of overheads uses Impact Assessment guidance proxies of 30% of staff costs. This uplift has been applied to wage costs to take account of overheads and employer costs, such as pensions and national insurance, as per the Standard Cost Model from the Department for Business, Innovation and Skills (BIS).

***Table 8:*** *Annual Administration Cost Estimates for 12% Transfer (£m, 2012/13 Prices)*

| Delivery body / Agency | Staff Costs | Overheads | Additional IT |
|---|---|---|---|
| **Natural England** | 20.2 | 6.1 | 11.1 |
| **Rural Development Delivery Team** | 4.6 | 1.4 | |
| **Forestry Commission** | 1.2 | 0.4 | |
| **Defra** | 1.5 | 0.4 | |
| **Rural Payments Agency** | 3.2 | 1 | |

When analysing administration costs for the baseline, we have reduced the administration costs in proportion to the overall programme budget. In line with the rest of the analysis, only administration costs additional to those incurred in option 0 are included in the benefit cost ratio estimate of the additional activities in the preferred option.

Administration costs for each body have been assigned to activities as follows:

- **Natural England** costs have been apportioned based on relative spend to environmental land management;
- **Rural Development Delivery** Team costs have been assigned to farm and forestry productivity, rural growth and LEADER;
- **Forestry Commission** costs have been assigned to forestry spending; and
- **Defra and Rural Payments Agency** costs have been apportioned to each of the activities under RDPE based on relative spend.

We do not model costs associated with the delivering of skills, as at present we do not have estimates of these costs. This is also true for loans. It would seem likely that there will be additional costs associated with delivering Rural Development Programme funds in the form of loans. However at this stage of scheme delivery design it is too early to quantify this exact cost.

The Government will implement the next Common Agricultural Policy in England in ways that are as simple, effective and affordable as possible. The ambition is to significantly reduce the steady state running costs of delivering the Common Agricultural Policy over the new programme period to the minimum possible, aiming for a reduction of 30% by the end of the next spending review period. This will be achieved by:

- the implementation of a new CAP Delivery IT system;
- rationalising delivery bodies involved in CAP payments;
- Pillar 1 policy and implementation choices; and
- Simple, cost-effective schemes in the next Rural Development Programme.

The new Common Agricultural Policy delivery system is expected to be a much more efficient, customer friendly, online system ready to support implementation from 2015. The system includes a single online application system to cover both Pillars of the Common Agricultural Policy. It will replace an ageing array of IT systems, and costly and inflexible contractual arrangements.

For the purposes of this Impact Assessment we therefore assume a 30% reduction in all administration costs shown in Table 8 by the end of the next spending review period in 2018/19. The reduction is split equally across the years to 2018/19.

# 10. Beneficiary administration costs and policy burden

## 10.1 Introduction

A variety of information and assumptions underpin the cost estimates in the analysis, but wherever possible these reflect actual evidence from the current programme provided by the Rural Development Programme team within Defra. Estimates of the costs to farmers of delivering agri-environment schemes are assumed to be equal to the value of the payments made under the New Environmental Land Management scheme. Costs incurred by beneficiaries as a result of participating in the RDPE are made up of the following:

- **the cost of applying for funding**: this will include costs to businesses of both successful and unsuccessful applicants;
- **the costs of inspection**: projects under different programme areas will experience different levels of inspection; and
- **the private contributions to the cost of projects,** including opportunity costs where relevant. These are based on the assumptions of intervention rates in Section 6.

## 10.2 Applications and inspections

It is important to note that an assumption in estimating the costs to land managers of delivering agri-environment schemes is that the level of subsidy payment they receive exactly corresponds to the resource costs of delivering the agri-environment options. Given participation in these schemes is voluntary some land managers are likely to receive a higher level of agri-environment funding than is necessary to exactly offset the costs of their participation and so earn producer surplus from agri-environment scheme participation. This implies the resource costs, in these cases, will have been overestimated.

The cost of applying for funding and complying with inspections has been estimated based on discussion with Rural Development Programme delivery bodies. These time commitments are then converted to financial costs by multiplying by the relevant hourly wage rate, which we assume to be between £14.24 and £15.85 an hour.[21] We assume that farm and forestry productivity support and Growth Programme training schemes last 30 hours for the purposes of estimating the opportunity cost associated with a participant attending these training schemes. The total number of applications is based on the target from the previous scheme. Targets for the new programme are being finalised. Table 9 shows a summary of Rural Development Programme beneficiary monitoring and application costs.

[21] These figures have been provided from the Rural Development Programme Delivery Team and Natural England who administer the current programme. The cost estimate also includes a 30% premium on wages for overheads. This overhead covers costs in connection with fixed administration costs, such as expenses for premises (rent or building depreciation), telephone, heating, electricity, IT equipment, etc. The overhead also includes absence owing to illness, since the hourly pay used to calculate administration costs should, as far as possible, be the hourly pay per effective hour. The overhead also covers employer's National Insurance Contributions.

***Table 9:*** *Summary of Beneficiary Costs (£, 2012/13 prices)*

| Scheme | | Application time (hrs) | Application cost (£) | Time to comply with Monitoring (hrs) | Cost of Monitoring (£) | No. of Applications | Total No. of Beneficiaries |
|---|---|---|---|---|---|---|---|
| **New Environmental Land Management** | Agri Environment | 12.5 | 195 | 10 | 156 | 30,000 | 76,000 |
| | Forestry | 4.5 | 64 | 1 | 14 | 13,200 | 10,000 |
| **Farm and forestry productivity** | Training | 1.5 | 23 | 1.5 | 23 | 115,000 | 115,000 |
| | Non-Training | 12.5 | 195 | 14 | 218 | 4,500 | 4,500 |
| **Growth Programme** | Training | 1.5 | 23 | 1.5 | 23 | 15,500 | 15,500 |
| | Non-Training | 12.5 | 195 | 14 | 218 | 14,290 | 14,290 |
| **LEADER** | Training | 1.5 | 23 | 1.5 | 23 | 5,000 | 5,000 |
| | Non-Training | 12.5 | 195 | 14 | 218 | 5,000 | 5,000 |

### 10.3 Private contributions

Private contributions are estimated using data on interventions rates referred to in section 6. In addition the private contribution figures shown below in Table 10 also include assumed interest payments made on loans from the Growth Programme.

### 10.4 Aggregate impact

The aggregate impacts of costs to business are calculated on the basis of the targets used in the current programme for the number of participants or holdings, which have been adjusted to reflect the 12% transfer from Pillar 1 to Pillar 2. Estimates of total administration costs associated with the new programme are displayed below in Table 10. To estimate aggregate administration costs we assume that applications are spread equally over the next Rural Development Programme. All administration costs are therefore smoothed over the period. We also assume that all monitoring and inspection is carried out in equal amounts each year and hence again these costs are smoothed over the entire programme.

***Table 10:*** *Total Costs (Present Values) to Business (£million, 2012/13 prices)*

| Option | Beneficiary Admin Costs | Business Contributions | Total Beneficiary Costs |
|---|---|---|---|
| **Preferred Option** | 59 | 263 | 322 |

The present value aggregate costs to businesses of applying to the Rural Development Programme and costs of complying with monitoring over and above the baseline option are £59m over the seven year programme. Total leveraged private contributions to farming and forestry productivity support, the Growth Programme and LEADER are £263m. While this is assumed as a cost to business, to estimate the policy burden of the new programme, applicants apply voluntarily so we assume the benefit applicants receive in terms of grant paid is equal to the costs of application and monitoring. Annex F

shows the equivalent annual net cost to business calculations and assumptions used to derive the estimates.

# 11. Benefits

## 11.1 Introduction

This section looks at the benefits, both monetary and non-monetary, of the next Rural Development Programme. It provides an overview of the approach to derive monetised estimates of benefits and of the main categories of benefits that could not be monetised. It then reviews in more detail the evidence on benefits across the programme areas.

An important implicit assumption in the approach is that the next programme will be able to at least replicate the cost-effectiveness of the current programme in terms of benefits per pound invested. In fact, learning from the current programme may support an improvement in the cost effectiveness of the next programme. The use of benefit cost ratios also implicitly assumes that constant returns to scale to investment in different RDPE activities apply across the set of options considered. This seems to be reasonable as an overall working assumption considering the range of funding options that are being considered in relation to the shape and size of the current RDPE, but benefit cost ratios of marginal intervention can always differ from programme averages.

## 11.2 Monetised benefits

The analysis of the monetised benefits of Rural Development Programme activities reflects a number of evaluation sources that analysed the impacts of the current RDPE, including a recent mid-term evaluation report by ADAS-Hyder, an evaluation of LEADER and a body of evaluation evidence for agri-environment schemes. It also includes a range of other sources (including appraisal and evaluation evidence) and ad hoc modelling.

During the current Rural Development Programme the financial crisis and the global economic downturn have constrained UK growth overall. However, employment has generally remained relatively resilient. The next programme is expected to face a more positive macro-economic environment, which may result in a narrowing of the output gap and increasing productivity as businesses substitute labour for capital. As a consequence the job creation impacts estimated in evaluations of the previous programme may overestimate the job creation potential in the future when the economy could be operating closer to full capacity. On the other hand some interventions (especially under the Growth Programme), have the potential to increase the economy's long-term productive capacity (see Annex E).

Existing evidence was sufficient to produce good estimates of the possible benefits associated with a reasonable spread of specific interventions relevant to land management and rural growth. On the other hand, robust evidence of the impacts of the Rural Development Programme on farm and forestry productivity support is particularly limited. Monetised estimates of benefits in this area are best understood as partial and illustrative estimates at this stage. The highlights of the review of evidence on the benefits of Rural Development Programme interventions are summarised overleaf in Table 11 in terms of benefit cost ratios. The basis of these estimates is described in the sub-sections 11.3 -11.7.

Benefit cost ratios allow for straightforward modelling of benefits because the yearly benefits associated with alternative options (in real terms) can be quickly computed by multiplying costs for each activity by the relevant benefit cost ratios. The present value (2012/13 prices) of the benefits can be computed by discounting these flows of benefit by 3.5% (in accordance with HMT Green Book guidance).

When applying benefit cost ratios to produce estimates of benefits consideration is given to the basis on which they were originally estimated. For example, benefit cost ratios for agri-environment reflecting

programme costs only have been applied to programme costs only. By contrast the forestry benefit cost ratios reflect administration costs, and so are applied to cost estimates which also include administrative costs.

In addition to introducing the main benefit cost ratios that have been used for modelling purposes, the following sub-sections also introduce benefit cost ratios for specific types of intervention (for example those aimed at heritage). These have not been used for the purpose of option modelling as this would require more detailed assumptions about the specific design of land management interventions. However, this evidence is presented for completeness.

***Table 11:*** *Benefit cost Ratio Conclusions for RDPE Activities*[22]

| Area of Activity | Sub-Area | Benefit Cost Ratio Ranges (Best Estimate) | Source | Confidence |
|---|---|---|---|---|
| **A i.) Environmental land management: agri-environment** | | **2.2 – 5.5 (3.7)** | FERA Report + additional internal analysis drawn from variety of published sources | **Good** Ranges reflect reasonably robust and recent evidence |
| | | **2.2 –5.3 (3.5)** | | |
| **A ii) Environmental land management: forestry** | Creation | **1.6 – 4.7 (3.2)** | Internal analysis using published sources | **Low-Moderate** Carbon valued robustly, Biodiversity/Landscape use proxies and reflect old valuation evidence |
| | Management | **5.0 – 6.1 (5.6)** | | Wood fuel valued robustly, Biodiversity/Landscape use proxies and reflect old valuation evidence |
| **B.) Farm and forestry productivity** | | **0.86 – 1.73 (1.03)** | CCRI Report | **Low** Illustrative estimates: rely on financial proxy approach and reflect interviews with small sample of beneficiaries and non-beneficiaries |
| **C.) Rural growth** | | **(2.51)** | Internal analysis of different types of rural growth interventions | **Moderate** Internal estimates vary in robustness but evidence base has improved since consultation IA. |
| **D.) LEADER** | Business: Direct Growth | **4.81-5.32 (5.07)** | Ekosgen Evaluation Report | **Moderate** Estimates reflect thorough methodology but there is uncertainty as to the future persistence of benefits. |
| | Community: Indirect Growth | **3.55 – 3.87 (3.71)** | | |

[22] Note that BCRs are not directly comparable as they are each based on different methodologies and include different costs.

### 11.3 A) Environmental land management: agri-environment

#### Introduction

Details of existing agri-environment Environmental Stewardship schemes (ELS, HLS, OELS and UELS) and the proposed new environmental land management schemes (mid-tier and upper tier) are discussed in section 7 of this document. However, the new upper tier agreements (site specific) are expected to be closely related to the existing Higher Level Stewardship scheme, and 90% of such agreements are expected to be focused on farms with expiring Higher Level Stewardship agreements. Therefore, the existing Higher Level Stewardship valuation evidence is likely to be a robust estimate of the value of the benefits of new upper-tier environmental land management agreements.

**BOX 3: Environmental Stewardship schemes**

ELS stands for Entry Level Stewardship. It requires a basic level of environmental management, and participants can choose from a wide range of more than 80 management options. These cover all farming types. They include for example, hedgerow management, stone wall maintenance, low input grassland, buffer strips and various arable options. More information is provided at this link https://www.gov.uk/entry-level-stewardship

HLS stands for Higher Level Stewardship. It is usually combined with Entry Level Stewardship (ELS), Uplands ELS or Organic ELS options, but unlike these, entry into the scheme is subject to careful assessment and is a competitive scheme to apply for, with budgets set for each financial year. A wide range of management options are offered, which support key features of the different areas of the English countryside. More information is provided at this link https://www.gov.uk/higher-level-stewardship-operation-and-aims

OELS stands for Organic Entry Level Stewardship. It provides funding for those already farming organically on land registered with an organic control body (CB). Aid may also be available as top-up to OELS payments for those converting to an organic system. More information is provided at this link https://www.gov.uk/organic-entry-level-stewardship

UELS stands for Uplands Entry Level Stewardship. It is open to applications from all farmers and land managers with land in a Severely Disadvantaged Area (SDA) who meet scheme eligibility requirements. It is a voluntary scheme, designed to deliver environmental benefits in the widest possible areas by rewarding effective land management practices. Uplands ELS builds on the successes of ELS. It was launched in 2010 and replaced the Hill Farm Allowance (HFA). More information is provided at this link https://www.gov.uk/uplands-entry-level-stewardship

The principles underlying the new mid-tier (area specific) agreements are that, at the holding level, we require improved selection of options aligned to scheme objectives, better management of those options and, that by co-ordinating actions across agreements in defined areas, we achieve additional environmental benefits compared with Entry Level Stewardship agreements. However, it is anticipated that agreements will also be more expensive than current Entry Level Stewardship agreements, and therefore it is not clear whether the benefit cost ratio will increase or not. Owing to the uncertainty in determining how the mix of options and therefore the environmental impacts would change, the benefits of the mid-tier scheme have been estimated based on the Entry Level Stewardship benefit cost ratio.

However, owing to the improvements in scheme design the benefits are more likely to be at the upper end of the range.

### Method

To assess the benefits of policies with environmental impacts, HMT Green Book appraisal guidance outlines two recommended approaches: revealed and stated preference techniques. The valuation of non-market goods and services such as biodiversity and landscape necessitate an approach which does not use market prices. Stated preference studies are the only studies which can estimate non-use values. The benefit cost ratios presented here have been used to assess the costs and benefits of the new environmental land management scheme in the preferred scenario, and the costs and benefits of ELS and HLS in option 0. Benefit cost ratios for Environmental Stewardship are discussed in Annex B. [23]

### Evidence

Both contingent valuation and choice experiment approaches were used in a Defra and Natural England funded study by FERA (2010) entitled 'estimating the wildlife and landscape benefits of Environmental Stewardship.'[24] This study estimated the willingness of households to pay for Environmental Stewardship. Following a literature review, peer-review of the methodology, focus group testing and a piloting exercise, the study carried out extensive work to carefully translate the environmental outcomes in Environmental Stewardship schemes to scenarios for which survey participants could articulate their true willingness to pay. Tests were carried out on the robustness of the results and it was found that their validity was "comparable to those in other contingent valuation studies.' These valuations were then combined with data on the costs of the scheme to produce benefit cost ratios.

The study also considered the question of additionality, i.e. the additional benefits which would occur above business as usual environmental and farm management. Using data collected as part of earlier studies, questions in the willingness to pay survey were framed in such a way to elicit values for the additional benefits only.

In the original study, the benefit cost ratios only captured the biodiversity, landscape and greenhouse gas impacts of Environmental Stewardship. Additional benefits which were not valued include: potentially significant resource protection benefits (i.e. water and air quality); and benefits to the historic environment and archaeology. The scheme's impact on water and air quality was quantified using a tool called Farmscoper, which is designed to estimate the impact of the uptake of different Environmental Stewardship options on different farm types. This model has received close scrutiny from stakeholders, and is considered to be robust. Owing to option coverage limitations in Farmscoper, the impact of all options was not able to be assessed. These estimates were then combined with data on the uptake of those options under current Entry Level Stewardship and Higher Level Stewardship agreements to produce an aggregate impact, which was then valued.

Water quality impacts were valued using internal Defra values which were based on a report by ADAS, whereas air quality values were taken from published Defra guidance. Valuations for water and air quality based on willingness to pay estimates were inflated by 2% per annum to reflect the assumption that rising incomes should reflect a higher willingness to pay for health and environmental quality. In addition, the valuation for water reflects increasing household numbers based on projections by the Department for Communities and Local Government (DCLG).

[23] Further detail on UELS and OELS can be found in the RDPE Consultation Impact Assessment.
[24] Available at: http://archive.defra.gov.uk/evidence/economics/foodfarm/reports/documents/estimatingthewildlife.pdf

Greenhouse gas impacts were also revised to take account of more recent evidence on their quantified impact and revised $CO_2$ prices from the Department of Energy and Climate Change (DECC). Estimates of the greenhouse gas impacts of individual agri-environment options were taken from a tool called OSCAR, which models the way in which changes in land management impact on soil carbon sequestration. This tool was produced for the European Commission, and was chosen as it has greater option coverage than Farmscoper in terms of percentage of total points accounted for[25]. Where greenhouse gas impacts arise from reductions in output, these savings may be offset by increases in production elsewhere to maintain the supply of agricultural output. This may act to reduce the additional net savings of greenhouses gases in the UK, and therefore reduce the estimates of benefits.

### Benefit cost ratios

The benefit cost ratios covering wildlife and landscape impacts in the 2010 willingness to pay study were estimated at the time as 1.8 (or 2.0 when excluding the administration costs from the denominator). These have been updated to incorporate a more recent assessment of actual programme costs, the monetisation of broader environmental impacts, revised valuations and an adjustment to increase the willingness to pay estimates to reflect trend productivity growth, in line with Defra's value transfer guidance. The total value of the benefit from Environmental Stewardship is proportional to the number of households in England. Revised projections of the number of households have been taken from the latest DCLG projections. Annex B gives further details.

The **benefit cost ratios are 3.7 for the higher-level scheme and 3.5 for the mid-level scheme**. The main reason for this difference is the higher level of carbon abatement associated with upper-tier environmental land management which is partly offset by the relatively higher unit delivery costs associated with the more complex upper-tier scheme strand. However, the different strands address different environmental issues and so are not interchangeable. Upper-tier, in particular, is targeted at sites of high environmental value including those fulfilling specific obligations under the EU Habitats Directive. Administrative costs have been excluded from the benefit cost ratio estimates as they are accounted for separately. These estimates are considered to be reasonably robust estimates of the benefits associated with agri-environment schemes.

Table 12 shows the benefit cost ratios for the mid and upper-tier agri-environment scheme according to the source of the benefit. Following the original study, the low and high sensitivity scenarios consider a variation of the willingness to pay for biodiversity and landscape benefits. As it is clear from the table, these benefits drive the overall benefit cost ratios across both schemes. The reductions in greenhouse gas emissions do not include land use change and are substantially higher for the upper-level scheme compared with the mid-level scheme. The estimated impact on air and water quality pollutants is very small compared with the total agri-environment payment a farmer receives, causing benefit cost ratios very close to zero. Given that the benefits of the scheme area are divided by the total cost of the scheme in each case, and that the number of water options in the previous programme were low, the benefit cost ratios appear low in this analysis. Sensitivities for greenhouse gas, air and water quality consider variations in the impact the schemes have on pollution and also to reflect uncertainty on the value of pollution mitigation

[25] Details on the ELS point system can be found at this link http://www.naturalengland.org.uk/ourwork/farming/funding/es/els/

***Table 12:*** *Benefit cost ratios for the new mid-tier and upper-tier agri-environment schemes*

| | Mid-Tier | | | Upper-Tier | | |
|---|---|---|---|---|---|---|
| | Low | Central | High | Low | Central | High |
| **Biodiversity & Landscape** | 2.1 | 3.3 | 4.9 | 2 | 3.2 | 4.7 |
| **Greenhouse Gases (without land use change)** | 0.1 | 0.1 | 0.2 | 0.2 | 0.5 | 0.8 |
| **Air Quality** | 0 | 0 | 0 | 0 | 0 | 0 |
| **Water Quality** | 0 | 0.1 | 0.1 | 0 | 0 | 0 |
| **Overall** | **2.2** | **3.5** | **5.3** | **2.2** | **3.7** | **5.5** |

## 11.4 Environmental land management: forestry

### Introduction

It is anticipated that this scheme will no longer exist in the new programme but instead be incorporated into the new environmental land management schemes. Forestry projects mainly fall into two categories: woodland creation and woodland management.

### Method

The woodland creation benefit cost ratio comes from Defra internal estimates. This estimate calculates benefits over an 80 year period, and includes benefits associated with biodiversity, landscape, carbon and employment. It was not possible to estimate values for the benefits on air and water quality associated with woodland creation due to a lack of robust data. Estimates of carbon savings for the new programme can be made for spending on agri-environment activities and forestry activities, and these are set out in Annex C.

Evidence: Woodland creation: The carbon value of woodland creation uses estimates of carbon sequestered taken from the woodland carbon code lookup tables. DECC carbon values are used to value this sequestration. The biodiversity benefit associated with woodland creation was estimated using analysis by Garrod and Willis (1997).[26] This study estimated willingness to pay for marginal increases in biodiversity. The landscape value associated with woodland creation comes from the study Willis et al (2003), which estimated the value of woodland landscape. The estimates of benefits associated with avoided carbon are considered to be robust as they use DECC guidance. However the values used for biodiversity and landscape are proxies and reflect old valuation evidence, and therefore cannot be viewed as robust.

The costs included in the benefit cost ratio are from Forestry Commission estimates of the average cost to government of woodland creation. In addition, private contributions to projects by beneficiaries are included as well as the public costs of administering Rural Development Programme grants and the costs to applicants of applying for grants.

[26] The non-use benefits of enhancing forest biodiversity: a Contingent ranking study. *Ecological Economics* 21, Pages 45-61. Garrod, G. and Willis, K., 1997.

The mid-term evaluation of the RDPE estimated the deadweight of woodland creation grants to be 19%.[27] It is assumed that the new scheme would result in the same level of deadweight as the old; however in reality it is likely to be much lower due to improvements in targeting.

### Evidence: Woodland management

To estimate the benefits of woodland management, it is assumed that any activity improves the biodiversity and landscape ecosystem services of woodland. Carbon benefits are not estimated as the impact depends primarily on the end use of any timber extracted which is highly uncertain. The value of timber/wood fuel extracted is estimated. Benefits are calculated over the 10 year period of the current agreements. Benefits associated with job creation are also included.

The landscape value of woodland management is estimated using the Entec-Hanley (1997)[28] study in to landscape improvements in British forests. This study used stated preference techniques of choice experiment and contingent valuation. Biodiversity is the primary benefit of woodland management, the benefits of which are estimated using Garrod and Willis (1997)[29] which estimated the public's mean willingness to pay for non-use biodiversity value of remote coniferous forests in Britain.

Benefit estimates associated with wood fuel follow published guidance and are considered robust. However the landscape and biodiversity values are proxies based on willingness to pay evidence and such cannot be seen as robust. Costs associated with woodland management come from Forestry Commission estimates. The benefit cost ratio estimate also includes the costs of administering RDPE grants or the cost to applicants of applying for grants.

Two measures covering woodland management were assessed in the mid-term evaluation (measures 225 and 227). The average of the deadweight of the two measures is used to estimate the deadweight for management (47% for 225 and 33% for 227).[30] This is estimated to be 40% which is likely to be high for the next Programme as the Forestry Commission are working to reduce the deadweight associated with woodland management.

### Benefit cost ratios

Following the above methodology **a benefit cost ratio of 1.6 to 4.7 with a central estimate of 3.2** is estimated for woodland creation after adjusting for deadweight. This range is created by using the upper and lower DECC values for carbon. A **benefit cost ratio in the range of 5.0 to 6.1 with a central estimate of 5.6** is estimated for woodland creation. This range is created using the maximum and minimum estimates from the studies that analyse landscape and biodiversity values.

## 11.5 B) Farming and forestry productivity support

### Introduction

Data on total factor productivity in UK farming shows that the UK has performed poorly in recent decades and UK agricultural competitiveness has declined relative to other OECD countries[31]. However

[27] Rural Development Programme England Mid Term Evaluation, Page 240, ADAS & HYDER, 2010.
[28] Valuing Landscape Improvements in British Forests. Report to the Forestry Commission, Entec and Hanley, N., 1997.
[29] The non-use benefits of enhancing forest biodiversity: a Contingent ranking study. Ecological Economics 21,Pages 45-61. Garrod, G and Willis, K., 1997.
[30] Rural Development Programme England Mid Term Evaluation, Page 149/150, ADAS & HYDER, 2010.
[31] Ball et al (2006) Productivity and Competitiveness in EU and US Agriculture, Defra, USDA

there is a mixed picture across the different farming sectors and a wide distribution of performance within the industry, with a sizeable minority of farms not able to recover their costs[32]. Some sectors, notably dairy and cereals, perform on average well in an international comparison, whereas others such as the pig and beef sector perform less well.[33] Our information about the forestry sector shows potential for improvement in active woodland management.

Overall our evidence leads us to conclude that there is value in using public funds to support farming and forestry businesses in becoming more productive, efficient and resilient. By encouraging farmers to become more market orientated and increasing their competitiveness in domestic and international markets, we are supporting the broader government priority for boosting exports. This will be increasingly important for the farming and forestry sectors in particular as they make the long-term transition away from direct subsidies. In addition, there is also scope to make investments which can achieve the twin purpose of increasing farming productivity and improving environmental and animal health and welfare outcomes.

We have not assessed fully the impact of Rural Development Programme funding on farm and forestry productivity in the current programme, in particular because of the transfer of management responsibility from the Regional Development Agencies to Defra in 2011. Data from the Regional Development Agencies recorded before this hand-over is currently being migrated to the RDPE Online Database. This means that a full assessment of the effects of funding on productivity and competitiveness has not been possible to complete. We have thus not been able to monetise many of the benefits associated with farming interventions. However, it is worth noting that wider evidence on farming competitiveness is clear on what the key drivers of productivity growth are. For example, OECD evidence states that the rate of innovation, diffusions of new technology and best practice, and the educational and skills level of farmers are key in driving productivity of the sector.[34]

### Method

Illustrative benefit cost ratio estimates are presented in Table 22 (at Annex D), for a number of farming and forestry productivity and competitiveness interventions. These reflect the evidence available from the current programme and other sources, but are reliant on rather broad brush assumptions. These also reflect only a subset of the benefits associated with the relevant interventions, meaning they are unlikely to be fully representative of the broader range of RDPE interventions that could be funded under the farm and forestry competitiveness objective.

A recently published CCRI report for Defra has applied a Social Return on Investment (SROI) approach to determine benefits associated with interventions under Axis 1 and Axis 3 of the current programme.[35] The CCRI estimates indicate that Axis 1 interventions may have been border-line cost effective in the current RDPE, but what can be achieved in the new programme will strongly depend on targeting actual market failures and the detail of scheme design. Overall, in the absence of clearly better or comprehensive evidence we have decided to use the CCRI benefit cost ratio to estimate the benefits associated with farm and forestry competitiveness.

---

[32] Based on Defra Farm Business Survey data.

[33] EU dairy farms report 2011, EU cereal farms report 2011

[34] Fostering Competitiveness and Innovation in Agriculture, OECD

[35] http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=18500#Description

## Evidence

Since the consultation state Impact Assessment, we have been able to expand our evidence base since the cost benefit modelling for the consultation impact assessment. This will help focus our support for farm and forestry productivity on areas that will deliver attractive productivity gains and value for money. The latest evidence is summarised in Annex D. This includes some illustrative benefit cost ratios and evidence on the potential for intervention where these are not available.

We have also conducted internal analysis of the effect of Rural Development Programme grants on farm performance[36]. This analysis used Farm Business Survey data to determine whether farms which received RDPE grants had improved their profitability compared to those which did not. The study was unable to find evidence for a relationship between RDPE grants and farm profitability. However, many of the grants had objectives other than improving economic performance, such as facilitating animal health or environmental improvements or enabling farm diversification. These grants may have generated benefits which are not picked up in this research, while also making it more difficult to identify any performance effects from grants which aimed to increase farm productivity.

The recently published CCRI study has attempted to produce a benefit cost ratio for farm and forestry productivity and competitiveness interventions in aggregate and monetises a number of the outcomes not included in the individual benefit cost ratio estimates. This application of the Social Return on Investment (SROI) approach relies on a survey of RPDE beneficiaries and other stakeholders to identify the range of outcomes which RDPE Measures could achieve. It then assigns financial proxies to these outcomes in order to estimate the return on investment of RDPE. The approach seeks to reflect judgements on the strength of the causal link between RDPE funding and relevant outcomes. The modelling also accounts for deadweight and displacement, and provides present value estimates of benefits over a five-year period. It is the first attempt at applying the SROI method and assigning financial proxies to the wide range of socio-economic and environmental outcomes that RDPE measures deliver.

The process of monetising the relevant outcomes involves identifying financial proxies for each separate outcome. They use the ‘best financial approximation’ available through which to assess the significance of the outcome and thus allow comparison with other (monetised) outcomes. Beneficiaries were asked directly, in relation to each of the outcomes explored, whether they had received benefits (termed evaluative benefits), and whether they expected to receive all or additional benefits over the next five years (termed forecast benefits). There is some discussion in the CCRI report about how best to combine evaluative and forecast benefit SROI ratios. They suggest that in some cases forecast benefits may be simply added to evaluative benefits (when projects are expected to deliver additional benefits as a result of earlier investment) while in other cases projects may require further investment in order to realise the benefits that recipients forecast.

The cost-benefit ratio for evaluative benefits and costs only is 1.03. If forecast benefits were simply a windfall of Axis 1 investment so far, then CCRI estimates an SROI of 1.73. Alternatively, by taking a conservative assumption that achieving forecast benefits will require a new amount of investment equal to what has gone into Axis 1 projects thus far produces a SROI ratio of 0.86 (note that this would essentially double the denominator and therefore halve the estimate of 1.73). In general the report highlights a low additionality of some types of Axis 1 intervention such as grants.

[36] Defra: The impact of grants on farm economic performance, 2013.

We **use an updated SROI benefit cost ratio of 1.03** (in line with the SROI estimate of only evaluative benefits suggested by CCRI) **as our default illustrative assumption**, while testing sensitivity to benefit cost ratios of 0.86 and 1.73.

It should be noted that this BCR has certain limitations:

- It is based on a partial assessment of the comparative effectiveness of the current RDPE for 2007-13. RDPE schemes were designed largely as capital grants schemes for equipment and infrastructure with different and now slightly outdated policy objectives in relation to farm and forestry productivity. Additionally what evaluation we have been able to collect is in relation to the relatively new schemes in place for the past two years and is unlikely to capture the full range of benefits that will be delivered over a longer time scale.

- Benefits associated with farming productivity interventions are hard to assess because of the difficulty in separating the effect of Rural Development Programme spending from the backdrop of many other variable factors affecting farming productivity, such as the rate of research and development, exchange rates, the weather and, the macroeconomic environment which will be different during the new programme.

The benefit cost ratios shown here reflect public and private investment. Public funds constitute a maximum of 40% of the funding for any grants, so as shown below RDPE grants have been able to leverage a considerable amount of private finance, although some of this investment may have occurred without grants. An estimate of the benefits achieved compared to public expenditure would therefore yield a higher BCR.

In addition, we have widened our analysis to cover evidence of the impacts of individual interventions in FFPS (for example training); this evidence is summarised in Annex D. This also includes indicative BCRs for different interventions where available. These BCRs have not been used in the modelling for this Impact Assessment and are presented as indicative only.

### 11.6 C) Growth Programme

#### Introduction

The Growth Programme will adopt a new bottom up approach to identifying rural growth priorities. Local Enterprise Partnerships rather than central government will direct funding to the highest priorities in their area through their local growth strategies. These will use Rural Development Programme funding along with other EU and domestic resources to invest in activities that aim to overcome barriers to rural economic growth. Development and delivery of the Rural Growth Programme will be informed by the EU Structural Funds Investment strategies that the 39 Local Enterprise Partnerships in England are currently drawing up in alignment with their wider Strategic Economic Plans.

In the absence of any evidence as to how successfully the LEPs' local strategic plans will be implemented this Impact Assessment is relying on evidence of effectiveness drawn from the existing programmes under RDPE. The activities that Defra has said that it will fund with Rural Development Programme channelled through the Growth Programme are similar to some of those pursued under Axis 3 of the 2007-2013 programme.

Since the consultation Impact Assessment the monetised evidence base for activities within the Growth Programme has improved. It now covers 100% percent of the programme and includes updated and more robust evidence on the impact of government intervention in rural broadband. While the evidence

base has improved for some of the activities that will be funded in the Rural Growth Programme, there is still a degree of uncertainty due to the local nature of delivery and variation in Local Enterprise Partnerships priorities.

### Methodology

To estimate the benefits associated with the Growth Programme we have estimated benefit cost ratios for five growth type interventions under Axis 3 of the current RDPE. These include training, support for the creation and development of micro-enterprises, the Rural Community Energy Fund as the basis for rural renewable energy interventions, the Rural Community Broadband Fund as the basis for rural broadband interventions, and tourism activities.

The interventions within the Growth Programme are specifically targeted to promote the supply-side of the rural economy by improving the working of markets, strengthening capabilities, unlocking agglomeration economies and facilitating greater participation in the workforce. To the extent that this targeting is successful it will ensure that the crowding out effect is minimised and that the Growth Programme can deliver additional economic benefits for the UK economy through job creation and productivity improvements alongside more localised rural development benefits.

In Annex E we set out how we estimate the benefit cost ratios for these interventions and explain how we have decided upon an overall benefit cost ratio for activities funded through the Growth Programme. The conservative assumption has been made that effectiveness will mirror the current range of benefit cost ratios, rather than improving to the level of the activities generating the highest return.

We employ a weighted average of five benefit cost ratios estimated for current RDPE rural growth activities, which are set out in Table 13. The benefit cost ratio estimate has been weighted based on relative spend between the five activities. This is extracted from the Local Enterprise Partnerships' Draft Investment Strategies which profile spend for the five activities over the seven year programme. The intervention rates from the 2007-2013 programme are then used to determine the total weighted expenditure in the Growth Programme. This is therefore only indicative for the new programme since Local Enterprise Partnerships' expenditure is likely to change as investment strategies are further developed, and as local needs change over the seven year programme.

### Benefit Cost Ratios

Table 13 shows the benefit cost ratios for the 5 Growth Programme activities which are used in the modelling to generate an overall benefit cost ratio for the Growth Programme. Taking the **weighted average of the maximum and minimum benefit cost ratios provides a range of 1.73 to 6.79 with a best estimate of 2.51.**

***Table 13:*** *Benefit Cost Ratios for Growth Programme Activity*

| Activity | BCR Ranges (Best estimate) | % Of Growth Programme Spend |
|---|---|---|
| **Training** | 7 – 29 **(7)** | 20% |
| **Support for Micro Enterprises** | 0.5 – 2.3 **(1.4)** | 48% |
| **Renewable Energy** | 1.0-6.0 **(1)** | 11% |

| | | |
|---|---|---|
| **Rural Broadband** | 4.2<br>**(4.2)** | 10% |
| **Tourism** | 0.66—3.86<br>**(1.9)** | 11% |
| **BCR used in IA Modelling** | **1.7 – 6.8**<br>**(2.51)** | n/a |

The basis, justification and methodology used to generate the benefit cost ratios for the five growth programme activities are explained in detail at Annex E.

### Risks and Uncertainties

The analysis for all Growth Programme related interventions adjusts results for displacement and deadweight wherever possible. For example, rural tourism projects may in principle result in displacement across different locations (or displacement of other household expenditure) that reduce the net growth impact at the national level. It is only where the tourism intervention results in export substitution or by attracting new visitors to the UK that there will be a net gain and this displacement uncertainty is taken into account within the analysis. Checks are however undertaken as part of RDPE investment appraisals to minimise and avoid where possible the impact of displacement at the local level. Multiplier effects are also included where relevant and sufficiently robust.

The deadweight assumptions range from 25-50% and are taken from relevant evidence E.g. BIS on deadweight for Government funded training courses. We take a conservative approach to the monetised estimates in the Growth Programme. However, there are uncertainties in terms of crowding out private sector investment, especially in the next Rural Development Programme when macroeconomic conditions are expected to be very different from the previous programme, which coincided with the financial crisis.

## 11.7 D) LEADER

The Ekos Impact National Impact Assessment of LEADER is one of the largest surveys of LEADER beneficiaries undertaken. While the sample size is still relatively modest the responses are an accurate reflection of the type of support available to businesses under LEADER. The impacts are adjusted for deadweight, displacement, leakage, and multiplier effects which are estimated based on survey results.

### LEADER support to businesses

The average grant aid to businesses surveyed in the National Impact Assessment of LEADER[37] was £7,787. Key features of LEADER support are that:

- average increases in sales are about £8,000 to date and £38,000 including future returns;
- 55% of businesses surveyed assigned financial benefits (increased sales, profits and reduced costs) wholly to LEADER and 44% assigned employment benefits entirely to LEADER;
- 652 gross jobs generated amongst surveyed businesses are attributable to LEADER at a gross cost per job of £12,400 on total project investment of £8.1 million; and

[37] *National Impact Assessment of LEADER*, Ekosgen, 2011. Available from: http://rdpenetwork.defra.gov.uk/assets/files/Impact%20of%20Leader/National%20Impact%20Assessment%20of%20LEADER.pdf

- average deadweight (the proportion of total output which would have occurred regardless of LEADER investment), is between 13% and 18% depending on business sector compared with benchmark business support deadweight of 50.7%.

The deadweight assumed for business interventions in the Ekos report tends to be below most benchmarks. To take account of this we have adjusted the deadweight and adopted a more conservative estimate of the benefits of LEADER business investments. This is achieved by taking an average of the deadweight used in the Ekos report and a BIS report on Regional Development Agency interventions in 2009.[38] The adjusted deadweight assumed in this Impact Assessment for LEADER business support is therefore 34.4% and is more consistent with those used in the Growth Programme analysis.

Overall return on investment for support to business is **estimated at 4.81 to 5.32 with a central estimate of 5.07**. This central estimate is the benefit cost ratio assumption used for LEADER support spending.

### LEADER support to communities

Support to communities accounts for 42% of current LEADER projects and 43% (£8.3 million) of total project investment. The new programme will however have a greater focus on business support. A split of direct business support to indirect business support (community support), is assumed at 70% to 30%. The Ekos study showed that:

- 71% of project managers believe that LEADER projects have provided otherwise inaccessible services. A further 18% believe that similar services could be accessed but not locally;
- conservation, tourism and heritage projects have attracted an average of 6,665 additional visitors per project per annum to date;
- of the projects surveyed 669 gross jobs have been created or safeguarded to date as a result of LEADER and a further 462 are expected in the future; and
- across all community support projects average deadweight is between 17% and 23% and compares well against benchmark deadweight figures for sub-regional publicly funded projects of between 39% and 40%. Since this research was published, the LEADER approach has delivered a significant amount of programme spending and hundreds more relevant projects. Evaluation studies of Axis 1, 3 and also of the LEADER approach itself will demonstrate further the added value that this approach brings.

Ekosgen estimates of overall return on investment for LEADER support to community activities give a **benefit cost ratio of 3.55 to 3.87 with a central estimate of 3.71.** The central estimate is the assumption used in the analysis for this Impact Assessment. Due to a lack of relevant benchmarking data it is not possible to adjust the deadweight assumed for indirect growth interventions for LEADER at this stage.

## 11.8 Other RDPE Non-monetised benefits

Rural Development Programme activities are likely to deliver a broader range of benefits than it has been possible to monetise for the purpose of this cost benefit analysis. The main categories of non-monetised benefits we have identified include:

[38] Research to improve assessment of additionality, Table 3.1, page 14, BIS, 2009. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191512/Research_to_improve_the_assessment_of_additionality.pdf

- wider benefits of agri-environment schemes in relation to helping meet statutory and international obligations on habitats and biodiversity, and possible benefits in relation to improvement to the historical environment at archaeological sites;

- possible windfall benefits for local economies of interventions aimed at maintaining and improving historical heritage and landscape character;

- broader benefits from woodland creation and woodland management beyond the monetised benefits of biodiversity/landscape improvement, carbon storage and employment. These broader benefits (e.g. recreational access, increased habitat connectivity, flood prevention) are contingent upon geographical location and are not captured in available stated preference surveys of the value of forestry in the UK, which focus on non-use value of biodiversity and landscape improvements; and

- broader socio-economic benefits associated with socio-economic interventions targeting rural communities, for example in relation to the improvement of basic services and community renewal.

## 12. Results

In this section we display the results of the benefit cost analysis conducted for the baseline option and preferred option of transferring 12% from Pillar 1 to Pillar 2 of the CAP with an increased environment focus. The headline results are shown in Table 14 below.

***Table 14:*** *Summary of Cost Benefit Analysis of All Options (£m, 2012/13 prices)*

| Option | Present value benefits | Present value costs | Benefit cost ratio | Net present value |
|---|---|---|---|---|
| **Baseline Option** | 7,295 | 2,208 | 3.3 | 5,087 |
| **Preferred Option** | 4,012 | 1,529 | 2.62 | 2,482 |

Row two in table 14 shows the benefits and costs of the preferred option that are incurred over and above the baseline option.[39] Thus the preferred option has a net present value of approximately £2.5bn in addition to £5.1bn of benefits accrued in the baseline option 0. Therefore every £1 of additional investment in the next Rural Development Programme is estimated to generate £2.62 of benefit.

The cost benefit analysis suggests that the baseline option and the preferred option both have positive net benefits. It is therefore worthwhile to have a Rural Development Programme and, indeed, to go beyond the minimum option. The baseline option in itself offers good value for money.

While the baseline option has a higher benefit to cost ratio than the preferred option, the preferred option would leave the Rural Development Programme better placed to meet the challenge set by Natural Environment White Paper and the Lawton Review. The ambitions of Biodiversity 2020 would also be more achievable and the Programme would be better placed to reverse the decline in farmland biodiversity and meet legal requirements of the Habitats, Birds and Water Framework Directives. Wider policy outcomes for climate change, landscape and the Historic Environment would also be achieved. In addition, the preferred option significantly increases the potential for the Rural Development Programme to support economic growth in rural areas, and increase farm performance, in terms of productivity, efficiency and resilience.

Given the varying robustness of the evidence base for specific scheme interventions and the conservative approach taken to monetising the impact of the schemes, the overall benefit cost ratios are likely to underestimate the total benefit of the options analysed in this Impact Assessment. The analysis shows that all the potential areas of focus in the Rural Development Programme could deliver net benefits in principle, providing that activities are properly targeted and address clearly identified market failures. Similar to the consultation stage Impact Assessment the analysis suggests that intervention in agri-environment schemes still offer one of the highest value for money estimates of all RDPE Interventions

[39] The option estimates have each been adjusted to take account of the agriculture producer loss resulting from a 15% transfer of funding from Pillar 1 to Pillar 2 (£100 million present value cost).The actual transfer is just 12% but the closest scenario modelled was 15% which will overestimate the cost. The baseline option assumes a zero per cent transfer for the purposes of the incremental analysis, which is consistent with the CAP reform consultation.

# 13. Sensitivity Analysis

## 13.1 Benefit Cost Ratios

Sensitivity analysis is conducted on the results presented in section 12 with respect to each of the 'input' benefit cost ratios used for the programme areas. The basis of these ranges is discussed in the monetised benefits section (section 11). Table 15 shows the benefit cost ratios used in the sensitivity analysis.

***Table 15:*** *Benefit cost Ratios (BCR) used in Sensitivity Analysis*

| Area of activity | Sub-Area | Low BCR | High BCR |
|---|---|---|---|
| **A i) Environmental Land Management: Agri-Environment** | Mid-tier | **2.2** | **5.3** |
| | Higher-tier | **2.2** | **5.5** |
| **A ii) Environmental Land Management: Forestry** | Creation | **1.6** | **4.7** |
| | Management | **5** | **6.1** |
| **B) Farm and Forestry Productivity** | | **0.86** | **1.73** |
| **C) Growth Programme** | | **1.73** | **6.79** |
| **D) LEADER** | Direct Growth: Business | **6.05** | **6.71** |
| | Indirect Growth: Community | **3.55** | **3.87** |

Table 16 below displays the impact that the sensitivity analysis has on the net present value and benefit cost ratio for the preferred option. Consistent with the conservative approach to the analysis within the programme areas, the best estimate benefit cost ratio falls towards the low end of the low-high range. Even at the low range the next Rural Development Programme is still worthwhile, achieving value for money with £1.80 of benefit for every £1 invested.

***Table 16:*** *Summary of Cost Benefit Analysis with Sensitivities (£m, 2012/13 prices)*

| Option | PV Benefits | | Benefit Cost Ratio | | NPV | |
|---|---|---|---|---|---|---|
| | Min | **Max** | Min | **Max** | Min | **Max** |
| **Preferred** | 2,756 | **6,366** | 1.8 | **4.16** | 1,227 | **4,837** |

## 13.2 Sensitivity Analysis on funding allocations

In the analysis presented in the results section we assume a certain allocation of expenditure which is outlined in section 6. Given the current uncertainty over the precise allocation of funding, most notably in the LEADER and Growth Programmes, this analysis serves to assess the impact of changing the funding allocation within 3 of the 4 RDPE schemes. The CCRI study does not allow for the analysis to be broken down at the measure level for farm and forestry productivity support so the sensitivity analysis is not extended to this programme area.

The modelling of the agri-environment scheme assumes a split between upper and mid tier agreements and capital items which is based on best available information from Natural England. In reality the scheme is likely to change over the course of the seven year programme. This will depend on demand and uptake for the individual schemes, changing policy priorities, deliverability and potential severe circumstances e.g. flooding. The Growth programme spending allocation for the four priority areas is based on draft investment strategies from the LEPS which may change as local needs adapt over the seven year programme period. To account for this we present a spending sensitivity analysis to provide indicative impacts of changing the allocation of funding within the programme areas. Sensitivity scenario (A) allocates spending within the programme areas to activities equally, while sensitivity scenario (B) allocates spending to priority activities which have a higher benefit cost ratio based on the analysis outlined in Section 11.

***Table 17:*** *Spending Allocation for Modelling and the Sensitivity Scenarios*

| Scheme | Activity | Allocation for Modelling | Sensitivity Allocation (A) | Sensitivity Allocation (B) |
|---|---|---|---|---|
| **Agri Environment** | NELMS Upper Tier | 45% | 25% | 60% |
| | NELMS Middle Tier | 40% | 25% | 30% |
| | Forestry | 10% | 25% | 5% |
| | NELMS Capital | 5% | 25% | 5% |
| **LEADER** | Direct Growth: Business | 70% | 50% | 95% |
| | Indirect Growth: Communities | 30% | 50% | 5% |
| **Growth Programme** | Support for SME's | 48% | 20% | 10% |
| | Knowledge & Training | 20% | 20% | 40% |
| | Investment in Infrastructure: Small Scale Renewables | 11% | 20% | 0% |
| | Investment in Infrastructure: Broadband & ICT | 10% | 20% | 30% |
| | Support for Tourism Activities | 11% | 20% | 20% |

Sensitivity scenario (B) focuses the Growth programme on interventions to support knowledge and training, investment in broadband and ICT infrastructure and tourism activities which generate the best value for money of all the growth programme interventions. Similarly LEADER interventions are allocated to support business which generates greater value for money than community interventions. Table 18 shows the best estimate benefit cost ratios for the preferred option and the 2 sensitivity scenarios.

***Table 18:*** *Sensitivity Spending Allocation Scenarios vs. the Preferred Option (£m, 2012/13 Prices)*

| Option | Present value benefits | Present value Costs | Benefit Cost Ratio | Net present value |
|---|---|---|---|---|
| **Preferred Option** | 4,012 | 1,529 | 2.62 | 2,482 |
| **Sensitivity Scenario A** | 3,924 | 1,553 | 2.53 | 2,372 |
| **Sensitivity Scenario B** | 4,817 | 1,521 | 3.17 | 3,296 |

The results indicate that if the spending were allocated on an equal basis between the sub-programme activities within the agri-environment scheme, Growth Programme and LEADER (Sensitivity Scenario A) the associated net present values and benefit cost ratios would be marginally lower than under the preferred option spending allocation. This is driven largely by the benefit cost ratios used for the

individual activities in the Growth Programme and for the LEADER business and community interventions. The benefit cost ratios for the upper and mid-tier agri-environment schemes are very similar and therefore a change in allocation between upper and mid-tier New Environmental Land Management schemes (see table 12) is likely to drive comparatively small changes to the estimated benefits of the overall agri-environment scheme. Overall the difference between Scenario A and the preferred option is likely to be well within the overall range of uncertainty around the benefit cost ratios for individual schemes. Therefore it should not be regarded as particularly significant.

Sensitivity scenario B works on the basis of prioritising interventions within the four programme areas which generate greatest value for money. The net present value for this scenario is about 30% higher than under the preferred option Taken at face value, this would suggest that a much more focused allocation of spend within programme areas could generate greater economic benefits. However, this does not take account of local variations within a Local Enterprise Partnership geographic area and any improvement in the effectiveness of the newly designed New Environmental Land Management upper tier agreements compared with HLS [40]. The analysis is heavily influenced by existing benefit cost ratio evidence which we have explained is of mixed quality (section 3) and in some cases may stretch reasonable assumptions about programme scalability or constant returns to scale.

[40] The analysis of Upper tier agreements in this IA uses evaluation evidence of HLS which will be broadly similar to the New Environmental Land Management upper tier schemes.

# 14. Other assessments

## 14.1 Risks

There are two main types of risks to consider in differentiating between options. There are the delivery risks in having a Rural Development Programme, and the associated cost risk of having no Rural Development Programme (baseline option). As a Rural Development Programme that addresses at least four of the six priorities in the new EU Rural Development Regulation is a legal requirement of the draft Rural Development Regulation, the preferred option mitigates the risk of the associated costs of infraction and disallowance.

## 14.2 Small firms impact test

For the purpose of this Impact Assessment, all businesses having fewer than 250 full time equivalent employees are considered small businesses. Most, if not all, businesses receiving support from the Rural Development Programme will be small businesses. For example, all but 0.2% of farms in England are small firms. When both small and large businesses apply for Rural Development Programme funding the application process is not expected to disproportionately disadvantage small businesses. The programme adopts a more targeted approach to investment**,** drawing in those businesses which can most contribute to Rural Development Programme objectives. Positive encouragement of priority projects will help ensure that small businesses have access to new programme funds even if they have relatively little experience of applying for grant support.

## 14.3 Competition assessment

The impacts on competition are likely to be small compared with the scale of public benefits generated in delivering the RDPE. In addition, the scheme is voluntary and allows any type of farming, forestry or rural business to make an application, so is non-discriminatory. Results from the previous programme show that the majority of applicants are from small and medium sized businesses, which account for 70% of the total in rural areas. This is expected to continue in the future programme, so presenting a very low risk to potential competition, though there may be local factors to be taken into account. HM Treasury and the Office of Fair Trading publish guidance which applies to subsidies that carry the highest risk of distorting competition and these will be assessed routinely as part of the funding award process.

## 14.4 Equality Assessment

The initial screening process demonstrates that the Rural Development Programme has no major or disproportionate equality impacts. All individuals and businesses that meet locational and occupational characteristics can apply and access funding. The evidence shows no potential for discrimination and that all opportunities to promote equality will be taken into account within the design and implementation of the policy. Initial findings also show that the Rural Development Programme is likely to have an undifferentiated impact on those groups described as protected. This reflects the nature of the Rural Development Programme being open to anyone meeting the relevant criteria and focusing largely on public goods rather than delivering citizen-targeted public services.

## 14.5 Monitoring and evaluation

An ex-post evaluation of the current RDPE will be completed by 2015/16. In addition two enhanced Annual reports, including evaluation of the new Rural Development Programme is a requirement by the EU Commission in 2017 and 2019. This will provide an opportunity to review the new programme and look further at the impact and Value for Money of proposed actions. We will also shortly be undertaking a

further evaluation of current Axis 1 and 3 measures, including a beneficiary survey, which will provide further robust evidence of impact. This will build upon the current CCRI evaluation report and provide a benchmark for the 2017 and 2019 evaluations. It will also help to address current evidence gaps that have been described in this Impact Assessment.

This work will improve the basis for estimating benefit cost ratios for socio-economic, forestry and productivity and competitiveness interventions which have been identified as requiring further evidence. This is particularly relevant given the government's focus on jobs and growth and the contribution of the Rural Development Programme to the achievement of these policy aims. There is generally more reliable evidence on the benefit cost ratios of agri-environment schemes. The benefit estimates underpinning these benefit cost ratios focus on the environmental and carbon benefits of the schemes.

The mid-term evaluation of the current RDPE was not able to provide robust estimates of impacts on jobs and Gross Value Added of the current programme, which makes it difficult to estimate the impacts of the new programme. Other than the high level principles set out in the Green Book, there does not appear to be standard operational guidance within government to measure and value the impacts of projects targeting local growth and jobs. We are liaising with Other government Departments to try and establish a robust approach to strengthen the evidence in this area.

The monitoring and evaluation arrangements for the current RDPE are based on a common set of indicators devised by the European Commission in consultation with Member States and specified in Annex VIII of the Rural Development Implementing Regulation (Commission Regulation 1974/2006). However, this legislation will be succeeded by the new regulation which will govern the period covered by the new programme.

As well as the common indicators applying to all Member States, the Government will introduce a number of programme-specific indicators and targets to measure success against new programme objectives. Both common and additional indicators will be further developed during the lifetime of the new programme through on going evaluation, with evaluation undertaken as described above in 2017 and 2019, and an ex-post evaluation of the new Rural Development Programme in 2020/21.

### 14.6 Enforcement and sanctions

Provisions for the control of expenditure under the Rural Development Programme and compliance with EU requirements are currently based on the provisions of the Rural Development Regulation (Council Regulation 1698/2005), the implementing regulation (Commission Regulation 1974/2006) and the Controls Regulation (Commission Regulation 1975/2006). New regulations are being agreed at EU level to ensure enforcement during the period covered by the new programme.

The powers of the Secretary of State and delivery bodies to enforce the Rural Development Regulation and apply sanctions for non-compliance are provided in The Rural Development (Enforcement) (England) Regulations 2007 (SI 2007, No 75).[41] These will be superseded by new legislation which will govern the new programme.

The programme will follow best practice in relation to procurement rules for grants to ensure that equality rules are followed and there will be no bias in eligibility to an applicant's background or location.

**END**

[41] A copy of this Statutory Instrument is available at: http://www.defra.gov.uk/erdp/pdfs/rdp07_13/enfregs.pdf

# Annex A: Policy and Delivery Assumptions

## Introduction

This annex sets out the detailed assumptions used in this Impact Assessment. This includes: the new programme budget; inflation; Pillar 1 Greening; Rural Development Programme transition; funding mechanisms; and other innovative approaches.

## Available Rural Development Programme budget

The available budget for the new Rural Development Programme for 2014-2020 is confirmed at £3.537bn.

The level of transfer from Pillar 1 to Pillar 2 of the CAP was the main variable determining the Rural Development Programme budget. With a 12% transfer the breakdown of pillar 2 funding and total budget is displayed in table 19.

***Table 19:*** *RDPE 2014-2020 Budget resulting from a 12% transfer (£m, nominal terms)*

| Pillar 1 to Pillar 2 level of transfer | Pillar 2 allocation for England* | Pillar 1 to Pillar 2 transfer amount** | National Exchequer funding | Total Pillar 2 budget |
|---|---|---|---|---|
| **12%** | 1,427 | 1,552 | 558 | **3,537** |

*includes remaining funds from current programme in the total
** includes the 2014 transition transfer amount in the total

However, in addition to the level of transfer, other important parameters have yet to be confirmed or set. The main assumptions are:

a) The planning assumption for converting Euro's to Sterling remains at £0.80=€;[42]

b) all EU funds are consumed by 2020;

c) all amounts are in nominal terms (i.e. they are not adjusted for inflation);

d) commitments from the current programme and transition year carrying on into the new programme are unaffected by decisions on double funding with Greening of Pillar 1 payments; and

e) annualised figures are based on the EU allocation profile and do not represent Defra's forecast spend.

We have also taken the following into account in developing the preferred scenario:

- Funding is allocated first to existing commitments;
- 5% of EU funding is allocated through LEADER. This equates to approximately 4% of the combined EU and Exchequer budget;
- a minimum of 30% of EU funds must be spent on environmental priorities;

[42] This is the median exchange rate forecast over the seven year programme. Nominal £m budget for the RDPE is likely to change in line with the exchange rate.

- Defra has committed to contribute Rural Development Programme funds to the Growth Programme. The Growth Programme is also supported by other EU funds.

Based on these assumptions, an 1% average transfer is the absolute minimum needed to meet the contractual commitments left over from the current programme and the EU obligations to spend 30% on environmental land management measures and 5% through the LEADER approach.

### Inflation

Rural Development Programme budgets and spending are not adjusted for inflation. This means that over time the purchasing power of the Rural Development Programme budget is eroded by inflation. In the modelling we have therefore assumed that spending is declining in real terms over the new programme. As benefits are produced from spending, which is declining in real terms, the associated benefits also decline. However, administration and delivery costs do not fall in real terms, but as discussed in Section 9, we assume that delivery administrative costs fall by 30% in the new Rural Development Programme. We use the latest HMT Gross Domestic Product deflator with a future inflation assumption of 1.7% beyond 2018.

### Greening

Another issue that will have implications for the new programme is the approach that the Government takes towards Greening of Pillar 1. From 1 January 2015, 30% of the Basic Payment will be dependent upon certain eligible farmers carrying out three land management requirements: Crop Diversification, Ecological Focus Areas and Permanent Grassland. The costs and benefits of Greening are considered in the overall CAP Implementation evidence paper. For the purposes of this assessment the impact of Greening has not been factored in.

### Rural Development Programme transition

The next Rural Development Programme is expected to begin in January 2015 following a transition period in 2014, during which some spending from the current programme will be allowed to continue. In this assessment we have treated spending and commitments entered into during the transition period as part of the commitments from the current programme.

### New funding mechanisms

For some activities, the new programme may make use of loans or other financial instruments in place of the grants that have been used in the current and previous programmes. The exact details of which activities may use these and the extent to which they may be used are yet to be confirmed.

Other innovative approaches that may be used in the new programme include fostering greater collaboration between rural businesses, more local influence in tailoring scheme delivery to local needs, improved coordination of outcomes across landscapes and new delivery models. In addition, closer working with the private sector could support environmental outcomes through payments for ecosystem services (PES) approaches, including biodiversity offsets or covenants.

# Annex B: Agri-environment technical annex

## Further information on agri-environment benefit cost ratios (BCRs)

The New Environmental Land Management scheme benefit cost ratios (BCRs) are based on a combination of biodiversity and landscape valuation evidence from a report by FERA/Newcastle (2010),[43] and additional evidence on the greenhouse gas, water and air quality impacts. The estimates from the FERA/Newcastle report have been revised in a number of ways to reflect the latest environmental valuation benefits transfer guidance.[44] This annex sets out these revisions.

In the original report, the BCR of the landscape and wildlife impacts was assessed to be 1.8. Given administrative costs are accounted for elsewhere in the RDPE Impact Assessment analysis, these are excluded from the BCR (which is only applied to programme costs), raising it to 2.0.

To estimate the BCR, the report also estimated the programme costs which would be associated with Environmental Stewardship schemes covering 70% of agricultural land. This level of uptake was achieved in 2012, so actual programme spend figures can be used to revise the BCR. Given the actual cost was lower than that estimated, the BCR increases to 2.6.[45]

The report expressed the willingness to pay for Environmental Stewardship in per household terms. Therefore, changes in the numbers of households will affect the aggregate willingness to pay for Environmental Stewardship. Projections on the number of households were taken from a report by the Department for Communities and Local Government (November 2011). As the number of households is estimated to rise faster than that was assumed in the FERA/Newcastle report, the benefits increase proportionately and therefore the BCR rises to 2.8.

A final adjustment was made to reflect evidence that willingness to pay for environmental outcomes increases when incomes increase. This was done by combining evidence on the income elasticity of willingness to pay for environmental quality (1.0) and trend productivity growth, which is assumed to be 2% a year. Overall, this produces a BCR of 3.3 for biodiversity and landscape benefits of Environmental Stewardship schemes.

[43] Available at: http://archive.defra.gov.uk/evidence/economics/foodfarm/reports/documents/estimatingthewildlife.pdf
[44] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/182376/vt-guidelines.pdf
[45] For consistency with this new cost figure, the benefits are also inflated to 2012 prices from 2009 prices

# Annex C: Forestry technical annex

## Woodland creation

A BCR for woodland creation is estimated by valuing the benefits associated with avoided carbon, biodiversity, landscape and job creation. Benefits associated with air quality and recreational access are not included in this analysis. Benefits are calculated over 80 years to reflect general life span of a tree and for simplicity it is assumed that the trees remain in the ground and are not used for timber or wood fuel. Deadweight of 19% is assumed based on the mid-term evaluation of RDPE.[46]

The costs and benefits for woodland creation are assumed to be applicable to maintaining woodland cover. This is because the measure is designed to maintain existing woodland cover without which the land would not be replanted (for example as a result of felling due to a pest or disease). Therefore this effectively equates to new planting.

### Carbon

The woodland carbon code lookup tables are used to estimate the amount of carbon sequestered from new planting and the DECC carbon values are used to value this sequestration. These are calculated at 5 yearly intervals for 80 years and result in a net present benefit of £38,696 per ha. A range is estimate on the BCR results presented below by varying the carbon value using the ranges estimated by DECC.

### Biodiversity[47]

The examination of biodiversity utilised previous analysis by Garrod and Willis (1997) on remote coniferous forests to generalise 'biodiversity values' across the rest of Great Britain. Willingness to pay estimates for marginal increases in biodiversity were derived relative to values estimated for remote coniferous forests and were in the range £1 to £3 per household per year for a 12,000 hectare increase in forest.[48] This study estimated that aggregate values for new broad leaf planting are £34m per year, updated to 2011 prices. This is then divided by the number of hectares to give a value of £15 per ha. Over 80 years this gives a net present value of £427.

### Landscape

Willis et al (2003) produced robust statistical values indicating that households were willing to pay £268.79p per year for woodland views from home and £226.56p per year for views whilst travelling. This was used in the aggregate figure which was then updated in the National Ecosystems Assessment.[49]
Given that the number of households with a view of new woodlands planted through the Rural Development Programme is not known, the very approximate value of landscape benefits of woodland creation have been calculated by dividing the aggregated landscape value by ha of woodland (in 2003) to giver per ha value. This assumes that new woodland creation is carried out with the same proportion of new woodland being planted within a view of people's homes and roads, as existing woodland.

The aggregate landscape value for forestry in the UK was estimated to be £150 million per year (Willis et al) or £185 million per year (UK National Ecosystems Assessment, 2011).[50] The area of woodland in 2003 was 2.7m ha. Therefore the landscape value of each ha adjusted to account for willingness to pay elasticity was approximately £80 per ha (2011 prices).

[46] ADAS & HYDER (2010) Rural Development Programme England Mid Term Evaluation, Page 240
[47] From Willis (2003) using (Hanley et al., 2002)
[48] Scoping study on valuing ecosystem services of forests across Great Britain, Page 25, Eftec, 2001
[49] The social and environmental benefits of forests, Page 12, Willis et al, 2003

[50] As footnote 73 above, Page 26

Assuming that the landscape values occur immediately (they would in fact take a number of years to develop) and that the values themselves occur in perpetuity (as once established trees generally can only be felled if replanted), the net present benefit calculated over 80 years is £2,287.

### Gross Value Added (GVA) impacts

Forestry data is used to estimate the Gross Added Value (GVA) per ha for woodland creation. This is calculated using an average annual GVA for agriculture, forestry and fishing of £20,723. It is assumed that the GVA benefits for woodland creation and maintaining woodland cover only occur in year 1.

### Costs

The Forestry Commission (FC) estimate that the average cost to government of woodland creation would be £6,500 for actual establishment (cost in year 1) followed by ten years of maintenance at £200/ha/annum (paid annually) for 10 years. The level of grant is expected to be 80% (i.e. beneficiary contribution of 20%) so that carbon financing can legitimately be claimed. Therefore the total cost is £8125 per ha in year one for planting and establishment and £250 a year for 10 years for maintenance. It is assumed that the maintenance occurs for the full 80 years but that after year 10 it is fully funded by the land owner at an estimated £15 per ha per year.[51] This results in a net present cost to government of £8021 and a total net present cost of £10,415 (including the land owner's cost). These figures are estimates over a number of years and therefore are taken as 2011 prices.
Administrative costs are included in the assessment of costs. These estimates were made by taking the following steps:

- from 2007 to mid-2013 (6.5 years) 2357 woodland creation grants were issued;
- the estimated administrative costs to FC is £1,418 per application;
- the average size of a woodland creation grant is 5.5ha and therefore the FC administrative cost per ha is estimated to be £258; and
- the cost to applicants is estimated to be £64 per application (foresters wage is estimated to be £10.95 plus 30% overheads equalling £14.24, and it is estimated that it takes 4.5 hours to complete an application). Dividing this by the average size of application (5.5ha for creation) results in an applicant administrative cost of £12ha for creation.

### Benefit cost ratio (BCR)

Using the methodology outlined above we estimate a BCR for woodland creation of 1.6 to 4.7, with a central estimate of 3.2.

## Woodland Management

### Key assumptions

It is assumed that woodland management activity improves the biodiversity and landscape ecosystem services of woodland. It is not possible to calculate the carbon costs/benefits of woodland management as the impact will depend on the end use any timber extracted. The mid-term review of RDPE estimated deadweight for current RDPE Measures 225 and 227 (measures related to Forestry). The average of these estimates is used in this analysis, which is 40%.
Benefits are calculated over a period of 10 years assuming the rationale for support is to help make significant changes to either the woodland structure or management regime rather than just supporting on-going unchanged management (as it would not be possible to make such changes in a shorter period).

[51] Forestry Commission estimate

### Landscape

The Entec-Hanley (1997) study investigated landscape improvements in British forests using stated preference techniques: choice experiment (CE) and contingent valuation (CV). Willingness to pay for the ideal forest landscape was estimated to be £38.15 per household per year. The separate contingent valuation study indicated households would be willing to pay £29.16 per year to see enhancements in the appearance of British forests that resulted in the perception of an "ideal" forest emerging.[52]

Assuming that woodland management results in the ideal forest emerging £29.16 per household per year is taken as the lower bound estimate and £38.15 per household per year as the upper bound estimate. These figures are updated to 2011 prices and then divided by the number of ha of woodland in 1997,[53] which is then multiplied by the number of households in England to give a willingness to pay per ha, per year of £926. The net present value benefit over the 10 years of a management agreement is £7,974.

### Biodiversity

Biodiversity is the primary benefit of woodland management. There is only one study that can be used to estimate the value of marginal changes to biodiversity. The following text is adapted from the CJC study 'Economic analysis of Forestry Policy in England'.[54]

A study by Garrod and Willis (1997)[55] estimated the value for a marginal change, increasing biodiversity, in these forests was £0.30 to £0.35 per household per year per 1% enhanced biodiversity management standard in these forests [using a contingent ranking (CR) method]. A contingent valuation (CV) study produced similar results of £10 to £11 per household per year for biodiversity for a 30% increase of the area of this forest type.

The CR model of Garrod and Willis (1997) was a linear model which assumes each additional increment in enhanced biodiversity management of standard blanket commercial forests is valued equally. This may be a reasonable assumption up to the first 30% of blanket coniferous commercial forests restructured to meet an enhanced biodiversity standard (an axiom supported by the CV result).

It is assumed that the value for increased biodiversity is at least the same for broadleaf as conifer woodlands. It is then assumed that households would be willing to pay £10 to £11 per year to see an increase in management in 30% of the whole of English woodlands. This results in a net present benefit of £447 per year.

### Wood fuel

It is assumed that there is a market for all wood fuel and that all woods brought into management sell wood fuel from their woodlands. Expert opinion estimates that 80m$^3$ of wood fuel can be extracted from a hectare of woodland every 20 years and therefore it is assumed that 4m$^3$ per year is extracted. [56] Expert opinion is that broadleaf round wood is worth between £25 and £50 per m$^3$ and therefore a central

[52] Economic Analysis of Forestry Policy in England, Page 45/46, CJC, 2003
[53] The area of woodland for 1997 is not available and therefore the area in 2001 is taken as the nearest estimate. This is 1.1m ha and is taken from Forestry Commission (2001) Forestry Statistics Page 1. Available at: http://www.forestry.gov.uk/pdf/forestrystatistics2001.pdf/$FILE/forestrystatistics2001.pdf
[54] Available at: http://archive.defra.gov.uk/evidence/economics/rural/documents/forestry.pdf
[55] The non-use benefits of enhancing forest biodiversity: a Contingent ranking study. *Ecological Economics* 21, 45-61, Garrod, G and Willis, K., 1997

[56] Mike Render Forestry Commission, estimates used in the wood fuel implementation plan.

estimate of £37.50 m3 is used. [57] This equates to a value of £150 per year and a net present benefit of £1,291.

### Gross Value Added (GVA) impacts

Forestry data is used to estimate the Gross Added Value (GVA) per ha for woodland management. This is calculated using an average annual GVA for agriculture, forestry and fishing of £20,723. GVA. These figures can then be added to the benefit figures presented in Section 11 It is assumed that the GVA benefits for woodland management occur in each year of the agreement.

### Costs

Woodland management costs are more difficult to determine than woodland creation as the management actions may be very different across applications. However Forestry Commission analysis of grants over the last seven years, estimates that an average of £100/ha/annum would be an appropriate cost estimate. These payments would be made annually. This level of grant is estimated by Forestry Commission to be about 60% of the additional costs that would be incurred compared to unchanged management. Therefore the total cost of management is estimated to be £167 per year. The net present cost to government is £860 and the total cost is £1,438.

An estimate of the administrative costs associated with woodland management is made by taking the following steps:

- from 2007 to mid-2013 5894 management grants were issued;
- the estimated labour costs to FC is £1,418 per application;
- the average size of woodland management grant is 71 ha and so the FC admin cost per ha for woodland management is £20; and
- the cost to applicants is estimated to be £64 per application (foresters wage is estimated to be 10.95 plus 30% overheads equalling £14.24, and it is estimated that it takes 4.5 hours to complete an application). Dividing this by the average size of application results in an applicant admin cost of £1ha for management.

***Table 20**: Woodland creation net present costs and benefits including administration costs(£2012/13)* [58]

| | Net Present Benefit | Net Present Cost | Benefit Cost Ratio |
|---|---|---|---|
| **To government** | 41,193 | 8,279 | 5 |
| **Total** | 41,193 | 10,595 | 4 |

***Table 21:** Woodland management net present costs and benefits including administration costs*

| | Net Present Benefit | Net Present Cost | Benefit Cost Ratio |
|---|---|---|---|
| **To government** | 12,285 | 881 | 14 |
| **Total** | 12,285 | 1,456 | 8 |

[57] Ian Tubby Forestry Commission
[58] Nb. This can also be used for woodland restoration

### Benefit cost ratio

Using the methodology outlined above we estimate a BCR for woodland management of 5.0 to 6.1, with a central estimate of 5.6. This range was created by taking the maximum and minimum values estimated for landscape and biodiversity.

## Annex D – Farm and Forestry Productivity Support Technical Annex

### Benefit cost ratios

Table 22 below presents additional evidence for farm and forestry productivity support benefits not used in the modelling. They are illustrative of the types of interventions that will be supported in the next programme.

***Table 22:*** *Benefit cost ratios and additional evidence for farm and forestry productivity*

| **ILLUSTRATIVE COST BENEFIT RATIO USED: 0.87-1.73 (1.03)<br>SOURCE: CCRI[59]** | | | |
|---|---|---|---|
| **THEME** | **STRANDS** | **BCR (central estimate)** | **SUPPORTING EXAMPLES** |
| **Farm Competitiveness and Supply Chain** | Training | 4-19 (11.5) | OECD and UKCES indicate that skills are critical for supporting innovation, and that skills shortages and a lack of training are particularly acute in agriculture[60].<br><br>BCR is based on a survey of participants to find out how many had learnt new skills from training courses, and data on productivity gains and deadweight for additional qualifications provided by BIS.[61] |
| | Co-operative activities | N/a | An example of productivity gains from cooperation is Network Grain UK, a recipient of RDPE funding, who estimate that cost savings of 40% have been achieved for its farmers through co-operation on grain storage. |
| **Farming innovation, technology and knowledge exchange** | Innovation | N/a | OECD evidence indicates innovation is the principal driver of long term economic growth. This can be driven by R&D pushing out the frontier, or through tackling coordination and information failures which enable more farmers to reach best practice.[62]<br><br>Analysis of the returns to agri-tech R&D suggests a return on investment of 16-60% per year for 30 years[63]. Using the productivity scheme to support technology diffusion can help achieve higher returns within that range. |
| | | | |

[59] http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=18500#Description
[60] UKCES: Agriculture, Forestry and Fishing: Sector Skills Assessment 2012, 2012
[61] BIS, (May 2012) *Assessing the Deadweight Loss Associated with Public Investment in Further Education and Skills*,. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32281/12-767-assessing-deadweight-loss-with-investment-further-education.pdf
[62] OECD.(2011) *Fostering Productivity and Competitiveness in Agriculture*, OECD Publishing.
[63] Thirtle and Holding (2003) *Productivity of UK Agriculture: Causes and Constraints*

| | | | |
|---|---|---|---|
| | Knowledge exchange to promote innovation | N/a | The Irish National Farm Survey found that discussion group members were on average more profitable than non-members with higher gross margins per Ha of €1338 vs. €885.[64] The 2012/3 English Farm Business Survey found that 45% of high-performing farmers attended discussion groups on business management issues compared with 25% of low-performing farmers.[65] |
| | Advisory Services | 4 – 11.5 | It is difficult to value the benefits from advice; we would expect a BCR close to the lower end of the range for skills as advice provision will also resolve market failures of information provision and externalities, only with less potential for benefits to spill over onto third parties. |
| **Farm Resource Efficiency and Sustainability** | Water pollution | N/a | The Westcountry Rivers Trust working with over 1,000 farmers found an average farm benefit of £2,700/year to reducing water pollution, 80% directly related to the agricultural business[66]. |
| | Water efficiency | N/a | Trials of efficient irrigation systems for use when growing strawberries generated yield increases of 5-18% and a 20% decrease in fertiliser use as well as reductions in water use.[67] |
| | Nutrient management | 4.9 | BCR is based on internal analysis on enacting nutrient management regulations and is used as indicative for investments to improve nutrient management. |
| | Soil compaction | 3.6 | It is estimated that soil compaction costs UK agriculture at least £74m pa[68]. BCR is estimated as the benefits from avoiding soil compaction in a field of wheat in clay-based soil due to an investment in tracked tires[69]. |

[64] Teagasc (2013). *Impact of Participation in Teagasc Dairy Discussion Groups: Evaluation Report*. http://www.teagasc.ie/publications/2013/1844/Discussion_Group_Report_Web_Jan2013.pdf
[65] Defra (2013). *Farm Business Management Practices.* https://www.gov.uk/government/publications/farm-business-management-practices
[66] Environment Agency: Assessment of 'Win Win' Case Studies of Resource Management in Agriculture, 2005 p28.
[67] HortLink Project HL0187: Improving water use efficiency and fruit quality in field-grown strawberries
[68] Cranfield University Report to Defra: The total cost of soil degradation in England 2011, Defra paper code: SP1606
[69] Report to Defra: Studies to inform policy development with respect to soil degradation - SP1305

| | | | |
|---|---|---|---|
| | Ammonia pollution | 12.6[70] | BCR reflects use of slurry injection techniques to reduce ammonia pollution. Ammonia pollution caused a societal cost in 2011 of £626 million, and largely comes from agricultural sources. The health damage costs were £2,160/tonne, shortening the average UK lifespan by 5 years. We are also facing probable infraction of EU air quality regulations with associated costs. |
| **Animal Health and Welfare** | Animal Health and Tackling endemic disease | N/a | Bovine Viral Diarrhoea (BVD) costs the economy around £39 million over 10 years.[71] |
| | Animal welfare | N/a | The experimental PigSAFE farrowing system saw 10.88 piglets weaned per sow compared to 10.12 on average. [72] |
| **Woodland enterprise, deer management and supply chain** | Woodland management | 5.0-6.1<br><br>(5.6) | Defra internal analysis suggests that the net present value to society of woodland management are c.£12,285/Ha over 10 years. |
| | Deer management | N/A | A study in the East of England calculated that the regional cost to society of an unmanaged deer population was c.£8.6 million/year. It would be much more extrapolated across England. A productivity scheme would aim to reduce this cost by stimulating a venison supply chain and reducing the cost to government of culling. |

[70] Analysis was based on Rothamstead / ADA / CEH Edinburgh report to Defra " Inventory of Ammonia Emissions from UK Agriculture", 2011 and Imperial College London report to Defra "Scientific Support for Defra in development on national and international policy in relation to air quality and trans-boundary air pollution SSNIP" 2010.

[71] Report to Defra: Economic Assessment of Livestock Diseases in Great Britain. ZZ0102 (2003).

[72] Report to Defra: Re-designing the farrowing environment from first principles to optimise animal welfare and economic performance - AW0143 (2011).

# Annex E: Growth Programme technical annex

## Internal estimates of benefit cost ratios (BCRs) in Axis 3 of current RDPE

This annex sets out the methodologies and inputs used to estimate benefit cost ratios (BCRs) for various activities under Axis 3 of the current RDPE. These estimates are used as a proxy to forecast the benefits associated with the Growth Programme schemes under the next RDPE.

## Axis 3 training

The BCR for Axis 3 training estimates the increase in lifetime productivity as a result of business owners participating in the training. The costs included in the BCR estimate are those from providing and participating in the training.

Training schemes under RDPE are intentionally aimed at business leaders and senior managers specifically for the purpose of increasing their business and management skills. They are generally of a similar level to that provided by higher national diploma, undergraduate degree or master's degree. However RDPE only funds short "bite size" courses which could at most be equivalent to individual modules that typically make up these types of qualifications. For the purpose of this analysis we assume that courses in the next Rural Development Programme will involve 30 hours of formal learning (this is at the higher end of the spectrum in terms of training provided under the current RDPE). As such any increase in productivity as a result of participating in Rural Development Programme training is bound to be lower than the increase for a typical higher national diploma or master's degree. On the other hand, given the targeted nature of their design and self-selection by beneficiaries the increase in productivity could well be higher than a typical module under one of such further education courses.

### Benefits

Benefits of participating in an Rural Development Programme training course are estimated by: 1) calculating the increase in annual productivity as a result of the training; 2) spreading this benefit over the rest of a participant's working life; and 3) aggregating this across all participants who said they benefitted from the course.

### Increase in annual productivity

In this analysis a variety of wage premium estimates are used in order to estimate the labour productivity increase as a result of Rural Development Programme training courses. Wage premium estimates for higher education, such as an undergraduate or master's degree, have been made by the Department for Business, Innovation and Skills (BIS).[73] This report estimates that returns to undergraduate degree relative to A levels was typically 24%, though returns to agricultural degrees was lower at 14%. Wage premium of those with master's degrees was typically 9% more than those with undergraduate degrees. This report also estimated that the premiums associated with attaining a degree after the age of 30 falls to only 6%.

BIS have published a similar report that examines the wage premium associated with attaining qualifications at NVQ level 2 and 3, as well as more basic skill courses.[74] This report estimated a wage

[73] The Returns to Higher Education, BIS, June 2011. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32419/11-973-returns-to-higher-education-qualifications.pdf
[74] Measuring the Economic Impact of Further Education, BIS, March 2011. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32329/11-816-measuring-economic-impact-further-education.pdf

premium of between 2.75% to 5% for achieving level 3 qualifications when the participant already has an undergraduate or master's degree.

The estimate of 2.75% is used as the best estimate, though it is also the bottom of the range used, with the top of the range being the 6% estimated by BIS as the wage premium for those achieving a degree after the age of 30.

We have used the 2.75% parameter as the courses provided by Rural Development Programme are only a fraction of what would typically be learnt in an undergraduate or master's degree and thus the wage premium estimated for those types of qualification would likely overestimate the Rural Development Programme's training wage premium. Our midpoint estimate is about an eighth of that of a typical degree, which would appear to be appropriate. It is also consistent with the premium experienced by someone who already has a degree getting an NVQ level 3, which again appears appropriate given the level that RDPE is pitched at and how targeted it is.

The wage premium is converted to a productivity premium, which measures the increase in output as a result of the training course. BIS's paper on further education found the productivity premium to be double the wage premium. However another report by the National Audit Office found that the premium was more like 1.25.[75] This lower NAO estimate is conservatively used in the analysis.

The annual increase in productivity is estimated by multiplying the productivity premium by the output of typical participant. This is estimated by taking the average of gross value added per worker for the business service, distribution, transport, accommodation and food sectors. Gross value added per worker is estimated using ONS estimates of gross value added per worker for these sectors adjusted for Defra's rurality index, which estimates the relative prices of rural areas compared to England as a whole.[76]

### Benefits over time

We assume that the benefit of improved productivity as a result of Rural Development Programme training lasts for the remainder of the participants working life, so an assumption on average age of participants is necessary to estimate the impact. BIS found that the average age of someone participating in a provider based NVQ level 3 training course is 31. However to be conservative the average age of 42 is used for work-based NVQ level 3.[77] It is assumed that beneficiaries retire at age 65, and thus the productivity benefits of participating in Rural Development Programme training courses lasts for 23 years.

### Aggregating over participants

The number of participants utilising a new skill or process is used as a conservative assumption. This amounts to 73% for Measure 331 in the current RDPE, which has been derived from the RDPE ROD database. It is assumed that this figure is profiled equally over the seven years of RDPE for the purposes of calculating a net present value of the benefits.

[75] Estimating economic benefits from apprenticeships: Technical paper, NAO, February 2012. Available at: http://www.nao.org.uk/wp-content/uploads/2012/02/10121787_Technical_paper.pdf
[76] Page 82. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/245103/Statistical_Digest_of_Rural_England_2013_September_Update.pdf
[77] Measuring the Economic Impact of Further Education. Page 17, BIS, March 2011. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32329/11-816-measuring-economic-impact-further-education.pdf

### Deadweight adjustment

This figure is adjusted for deadweight, as these courses may have been provided in the absence of a Rural Development Programme. We have used a range of 25% to 30% (equivalently 70% to 75% additionality), which is consistent with the findings of BIS in their report on deadweight associated apprenticeships.[78] Further discussions with BIS have confirmed that this level of deadweight is typical for government training schemes.

### Costs

The costs associated with the training under Measure 331 have been estimated by taking the total of RDPE grant costs, private contributions, delivery administration costs, beneficiary administration costs and opportunity cost of attending the training.

The RDPE ROD database provides figures on total grant funding and private contributions. These figures are profiled equally over the seven years of the RDPE.

Delivery administration costs have been estimated by taking Defra forecasts of administration costs for the new Rural Development Programme, and assigning a share of these costs based on the proportional spend on Measure 331 relative to the total programme expenditure.

Estimates of beneficiary administration costs have come from discussion with members of the Rural Delivery Team. Applying for a course and complying with ex-post monitoring takes between 2 and 4 hours. Each training course lasts for 30 hours. This represents an opportunity cost in terms of not working which is factored in to the costs of the training.

The hourly cost of applying, attending and complying with monitoring come from ONS estimates of typical hourly wages associated with agricultural workers, with an extra 30% for overheads, as suggested by the Impact Assessment Standard Cost Model. To get the aggregate administrative cost of attending the training we have used the total number of beneficiaries, as opposed to just those reporting that they have benefitted.

For Measure 331, a **benefit cost ratio range of 7 to 29** is estimated, with a **best estimate of 7**.

***Table 23:*** *Key Assumptions for estimating the benefits of training*

| Assumptions | |
|---|---|
| Deadweight | 25 - 30% |
| Wage premium | 2.75 - 6% |
| Productivity Premium | 1.25X wage premium |
| GVA per Agricultural worker | £20,723 |
| Hourly Wage of Agricultural Worker | £11.97 |
| Age of participant | 31 – 42 |

[78] Assessing the Deadweight Loss Associated with Public Investment in Further Education and Skills, BIS, May 2012. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32281/12-767-assessing-deadweight-loss-with-investment-further-education.pdf

### Support for the creation and development of micro-enterprises

The BCR for the support for the creation and development of micro-enterprises is estimated by monetising the benefits of job creation associated with the intervention, adjusting the estimates for deadweight (including displacement effects).

The primary data on gross job creation are contained within the ROD database, although the estimates are adjusted for deadweight using an estimate of 50.7% suggested in a BIS report on Regional Development Agency interventions in 2009.[79] The remaining jobs are assumed to be created with an even profile in each year.

We measure the benefit of a job by using the annual estimate of gross value added per worker. The job creation figures are split between jobs created on farm or off-farm. We estimate the gross value added per worker (equivalent to output) in rural areas for agricultural workers. This estimate has been made using ONS estimates of gross value added per worker for the agricultural sector adjusted for Defra's rurality index which estimates the relative prices of rural areas compared to England as a whole.[80] For jobs created off farm we have used average gross value added per worker of business service, distribution, transport, and accommodation and food sectors. We then assume that the benefit of each job created lasts for between 1 and 5 years, with 3 years as a central case.

When assessing the costs associated with this intervention we use the total value of RDPE grant under this measure, plus the associated private contributions to projects. Delivery administrative costs incurred by the Government, related delivery bodies and beneficiaries are also included. These estimates are based on discussion with delivery bodies on the time taken for beneficiaries to apply for funding and to comply with monitoring and inspection.

This estimate leaves out important benefits that are not quantifiable using available evidence. Examples of these benefits include value of sales generated by the new businesses, the value of any exports, any indirect jobs created as a result of the new firms and the increase in entrepreneurial skills in the economy.

Using the methodology outlined above the BCR associated with Measure 312 is estimated to be between 0.5 and 2.3 with a central case of 1.4. This range is created by varying the length of time the benefit of each job lasts.

***Table 24:*** *Key assumptions for estimating the benefits of micro-enterprises*

| Assumptions | |
|---|---|
| Deadweight | 50.70% |
| GVA per worker | £28,849 |
| Length of job benefits | 1-5 years |
| Hourly Wage of Worker | £11.97 |

[79] Research to improve assessment of additionality, Table 3.1, page 14, BIS, 2009. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191512/Research_to_improve_the_assessment_of_additionality.pdf

[80]

## Investment in renewable energy infrastructure

There are significant uncertainties in the monetised estimates for Growth Programme intervention in renewable energy projects. Estimates are based on the business case for the joint Defra and DECC Rural Community Energy Fund. This scheme provides loans for communities to carry out feasibility studies for different renewable energy types. The Growth Programme however is unlikely to fund similar projects to the rural community energy fund and therefore the benefit cost ratio can only be viewed as illustrative at this stage. The overall benefit cost ratio employed however is in line with analysis undertaken by DECC on the impact of feed-in-tariffs and can therefore be considered reflective of government intervention in renewable energy schemes.

### Methodology

The Defra internal modelling calculates cost benefit ratios for different electricity and heat technologies from both a community and UK view.

### Electricity Technologies: Community View

Communities will derive three benefits from participating in the renewable fund, reflected in the modelling. Communities will receive:

- Feed-in tariff payments from the Government for each kWh of electricity generated;
- reduced or (if sufficient power is generated) free electricity use. This benefit can be computed by taking the average retail electricity tariff and multiplying it by average domestic electricity consumption. Thus we assume that households in 2012 save up to £462-495 per year on their electricity bills by being part of the scheme;
- Revenue from selling each kWh of excess electricity generated by the project back to the grid at 4.5p/kWh.

These three considerations make up the benefits of the fund at community level. The total benefit of a project is estimated by generating the net present value of these three benefits over the first twenty years of the project.

The costs of the electricity technology comprise the necessary initial capital costs[81] and ongoing operating costs[82] for each of the technologies. The total cost associated with each project is calculated using a net present value calculation over the project's first twenty years.

### Electricity Technologies: UK View

The UK derives two benefits from providing the renewable fund:

- A resource-cost saving associated with the displaced conventional energy generation;
- Carbon savings as a result of renewable generation of electricity.

[81] A capital expenditure is incurred when a business spends money either to buy fixed assets or to add to the value of an existing asset with a useful life that extends beyond the tax year.
[82] OpEx (Operational expenditure) refers to expenses incurred in the course of ordinary business, such as sales, general and administrative expenses

The costs of the electricity technology comprise the necessary initial capital costs and ongoing operational costs for each of the technologies. The total cost associated with each project is calculated using a net present value calculation over the project's first twenty years.

### Heat Technologies: Community View

Communities will derive between three and five benefits from participating in the renewable fund depending on which technology is used, reflected in the modelling. Communities will receive:

- Renewable heat incentive tariffs from the Government for each kWh of energy generated;
- Reduced or (if sufficient power is generated) free heat energy use. We assume this benefit represents reductions in participants gas bill;
- Renewable Obligation Certificate payments from Government for each kWh of electricity generated. This amounts to £67.50/MWh of electricity generated. Combined Heat and Power (CHP) is not subject to FIT, and instead receives the ROCs. The benefit associated with Renewable Obligation Certificate (ROC)s is calculated in the same manner as for Feed In Tariffs (FITs);
- Reduced or(if sufficient power is generated) free electricity use; and
- Revenue from selling the excess electricity generated by the project back to the grid.

The costs of the heat technology are comprised of the necessary initial capex, going opex and fuel costs for each of the technologies. The total cost associated with each project is calculated using a net present value calculation over the project's first twenty years. The equivalent cost of the counterfactual heating technology is assumed to be a gas boiler.

### Heat Technologies: UK View

UK derives two benefits from each of the heat technologies, with additional benefits if CHP is the technology used. These benefits are:

- An 'opportunity' cost associated with traditional generation of heat energy using fossil fuels. The energy generated by the community projects reduces the amount generated using fossil fuels. As a result the resource cost associated with fossil fuel generation is not incurred;
- Carbon savings as a result of renewable generation of heat. However the heat technologies produce carbon themselves and so any savings must be calculated with reference to an appropriate counterfactual technology. In this analysis we use gas boilers.

The costs in the UK view are calculated in exactly the same way as in the community view.

### Benefit Cost Ratio

The benefit cost ratio for the Rural Community Energy Fund is low largely due to the myriad of un-monetised benefits in the assessment. While the benefit cost ratios differ for the renewable energy type the benefit cost ratio employed for this impact assessment is £1:£1. This is low within the low to high range to reflect significant uncertainties.

## Investment in Broadband Infrastructure

Estimates of benefits associated with the Rural Community Broadband Fund (RCBF), taken from an SQW report for DCMS is used as a proxy for investment in rural broadband infrastructure. It uses the impact model developed as part of the UK Broadband Impact study and disaggregates the impacts of the Rural Community Broadband fund. The SQW model compares the difference between the impact of the current rollout (including all commercial and government subsidised schemes) with the impacts of all the above, minus the RCBF rollout.

The model is a simplification of what would really happen with and without RCBF funding, but it does give a reasonable indication of the magnitude of benefits that could be expected. The Impact report can be found here

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/257006/UK_Broadband_Impact_Study_-_Impact_Report_-_Nov_2013_-_Final.pdf

A number of additional assumptions are made in estimating the impact of the RCBF. Firstly it will provide 25,000 premises with superfast broadband by 2016, which accounts for approximately 0.1% of the total premises in the UK. The rollout is split over 2013, 2014, and 2015. These premises are split over the UK in the following way which have been informed by analysis of a sample of RCBF postcodes provided by Defra in June 2013:

- In the least dense population decile = 60%
- In the second least dense population decile = 19%
- In the third least dense population decile = 8%
- In the fourth least dense population decile = 6%
- Spread across the remaining population deciles = 7%

### Limitations

There are always limitations to modelling and predicting the future. This model draws on the best available data and evidence as well as the findings reported in the academic literature. Whilst recognising the uncertainties inherent in this task, we consider the model to be the most rigorous forward-looking quantification of broadband impacts developed to date in the UK.

There are some further limitations specific to this scenario:

- The model can only predict the impact of fixed-line broadband;
- The model is technology specific; so 25,000 fixed line broadband connections does not necessarily mean that they will all reach superfast speeds instantly.

### Results

Using the assumptions stated above, the RCBF has a net present value of £88m in 2013 prices over a 12 year period, with benefits accrued from 2013-14. 68% of this return is generated from enterprise productivity growth for firms able to access faster fixed-line broadband. A further 24% comes from local enterprise growth in the rollout areas. The remaining 8% is driven by increased teleworker productivity

through reduced commuting as well as increased participation of disabled people and carers in the workforce. The return represents a benefit cost ratio of 4.2 to 1 by 2024.

### Encouragement of tourism activities

The Impact Assessment for LEADER[83] by consultants Ekosgen disaggregates the impact of funding for tourism activities from total LEADER spending. While this analysis focuses purely on LEADER projects in the previous RDPE, it is a reasonable assumption there will be a large degree of cross-over in terms of the type of tourism activities that will be funded under the Growth Programme. It is therefore viewed as being broadly representative. The survey sample size for tourism development used in the Impact Assessment is satisfactory. However, there is some uncertainty in terms of the representativeness of the sample compared with the current LEADER programme. The report monetises the impact of LEADER intervention in tourism development in 3 main areas:

- **Jobs Created and Safeguarded:** The report used a similar methodology to estimating the impact of job creation to that used in the SMEs section of this annex, although uses a GVA estimate per job created of £36,098 (2008) which is below the national average. Jobs were assumed to last 2.9 years which is consistent with analysis of other Growth Programme activities. The number of jobs created and safeguarded from the surveyed sample, once aggregating across the scheme was similar to the figures collected in the RDPE database for LEADER interventions at the time of publication

- **Sales Increased and Safeguarded:** Sales were referred to as the annual business turnover of businesses through their day to day trading. In terms of impact, increased / safeguarded sales were the additional turnover generated by the business' participation in tourism development. Estimates per business supported were £17,274.

- **Increased day and overnight visitors:** There is an economic benefit arising from the increase in visitors; an average of £22 per day visit and £53 per overnight visitor is used to generate impact estimates for tourism development. The average additional spend by visitors per business supported was estimated to be £1,393.

The report made standard adjustments for deadweight, displacement, substitution and multipliers primarily based on survey results. It is recognised that rural tourism projects may result in displacement across different locations that reduce the net growth impact at the national level. Checks are however, undertaken as part of RDPE investment appraisals to minimise this at the local level. Where tourism intervention results in export substitution or by attracting new visitors to the UK the net gain is greatest. This uncertainty has to some extent been taken into account within the analysis.

The deadweight associated with LEADER tourism development interventions was estimated at 20% which compares favourably with BIS benchmarking data used for the SME section of this technical annex. This figure is based on survey results. [84]To account for this we take an average between the BIS deadweight and the Ekos deadweight for interventions in tourism development, and re-calculate the return on investment figures which used a lower figure for deadweight. The level of displacement used in the report is between 6% and 15% with tourism development at the high end of this range at 15%. This again is marginally below BIS guidance which sets a benchmark of 19%-20%. A multiplier of 110% was

[83] National Impact Assessment of LEADER, Ekosgen, 2011. Available at: http://rdpenetwork.defra.gov.uk/assets/files/Impact%20of%20Leader/National%20Impact%20Assessment%20of%20LEADER.pdf
[84] Research to improve assessment of additionality, Table 3.1, page 14, BIS, 2009. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191512/Research_to_improve_the_assessment_of_additionality.pdf

applied based on survey responses, which is conservative and below BIS research guidance for regional level interventions.

***Table 25:*** *Key assumptions for estimating the benefits of encouragement of tourism activities*

| Assumptions | |
|---|---|
| Value to businesses of Tourism related support | £18,667 |
| Deadweight | 35.50% |
| Multiplier | 110% |

**The evidence indicates that there are good returns on interventions in tourism activities with a BCR range from 0.66 to 3.86, and a central estimate of 1.90**. While this is for LEADER interventions in the previous programme, there are significant cross overs in terms of the activities the next Growth Programme will deliver. It is therefore an indicative estimate of what the Growth Programme will achieve.

## Annex F: Equivalent Annual Net Cost to Business (EANCB) calculation

Rural businesses across a number of sectors will have the opportunity to apply for funding under the Rural Development Programme. Their decision to do so is completely voluntary. As such the Programme will not introduce any new regulatory burden and does not fall under One In Two Out (OITO) rules. Those businesses that do decide to take advantage of measures under the Programme will face costs in terms of administration costs and (where relevant) private contributions or opportunity costs (e.g. when employees take up training opportunities). Costs associated with applications will be met by all businesses that decide to apply, even if they are ultimately unsuccessful.

While the programme does not fall under OITO rules, direct costs and benefits to business (following EANCB definitions) are estimated for transparency and completeness in table 26. At a high level, direct benefits to business include payments received under the Programme (which are transfer from the Government to business) plus any private benefits of investment. Costs include the overall investments undertaken by business under the programme (whether funded through programme expenditure or through private contributions) plus admin costs, plus the loss of output associated with the transfer of funds from Pillar 1 to Pillar 2. All costs and benefits have been estimated with reference to the baseline option.

More specifically benefits to business are defined as being inclusive of:

- overall payments to business under the Growth Programme plus the benefits to business of the Growth Programme;
- overall payments to business under land management schemes, plus the monetary benefits to business associated with forestry schemes;
- overall payments to business in support of on farming and forestry productivity, plus the benefits to business of these programme activities; and
- overall payments to business under LEADER plus the monetised benefits to business associated with the scheme.

Costs to business have been defined as being inclusive of:

- overall investment in the Growth Programme (sum of Programme-funded expenditure and associated private contributions), plus associated administrative costs;
- overall resource and opportunity costs on land management schemes, plus private contributions to forestry expenditure, plus associated administrative costs;
- overall investment in farming and forestry productivity (sum of Programme-funded expenditure and associated private contributions), plus associated administrative costs;
- overall investment in LEADER (sum of Programme-funded expenditure and private contributions), plus associated administrative costs;
- loss of agricultural output associated with alternative levels of transfer of funding from Pillar 1 to Pillar 2.

***Table 26:*** *Equivalent Annual Costs & Benefits to Business for the Preferred Option (£m, 2009 Prices, 2010 Base Year)*

| Option | Equivalent annual benefit to business | Equivalent annual cost to business | Equivalent annual net benefit to business |
|---|---|---|---|
| **Preferred Option** | 299 | 182 | 117 |

Overall the annual benefit to business of the preferred option is estimated to exceed the costs. The equivalent annual net benefits for the preferred option is estimated to be approximately £117m.

The benefits to business from Growth Programme and LEADER activities have been estimated using the benefit to cost ratios for these activities. These reflect private benefits measured in GVA terms (hence inclusive of wages as well as gross operating surplus), so in this respect they may overestimate net impacts on business. On the other hand wage elements (e.g. opportunity costs) are accounted for among the private contributions on the cost side of the Equivalent Annual Net Cost to Business (EANCB) equation.

An important assumption in estimating the costs to land managers of delivering agri-environment schemes is that the level of subsidy payment they receive exactly corresponds to the resource costs of delivering the agri-environment options. Given participation in these schemes is voluntary some land managers may receive a higher level of agri-environment funding than is necessary to offset the costs of their participation and so earn producer surplus from agri-environment scheme participation. This implies the costs may have been overestimated.

Estimates of the private benefits to business of investment in farming and forestry productivity were not readily available. Deriving these estimates would require disentangling private benefits from the illustrative Social Return of Investment, which is complex and arguably not worthwhile at this stage given the illustrative nature of these estimates. Instead a conservative assumption has been made that the return on investment to these activities is at least the value of the funds put in by the beneficiary, otherwise they would not have invested in the first place. A similar assumption has been made for the private benefits of forestry land management activities, which are relatively minor.

The loss of output which is estimated to be incurred by farming businesses as a result of transferring 12% of Pillar 1 funding to Pillar 2 is also reflected in the calculations. This adds up to £100m in present value terms (see the evidence paper accompanying the CAP consultation). Again accounting for the entirety of this cost probably overestimates the loss of operating surplus but a precise attribution was not possible.