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Ex-ante Evaluation and Strategic Environmental Assessment of the Rural Development Programme - Wales 2014-2020

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The European Agricultural Fund for Rural Development: Europe Investing in Rural Areas

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EX-ANTE EVALUATION AND STRATEGIC ENVIRONMENTAL ASSESSMENT OF THE RURAL DEVELOPMENT PROGRAMME - WALES 2014-2020

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Introduction

Old Bell 3 Ltd., working in association with Regeneris Consulting, Bangor and Cardiff Universities, Wavehill Ltd. and Mott MacDonald, was commissioned by the Welsh European Funding Office (WEFO)[1] in August 2012 to undertake the ex-ante evaluations of the Welsh European Structural and Investment (ESI) Fund Programmes to be developed for the 2014 – 2020 period. The ESI Funds comprise of the European Regional Development Fund (ERDF), the European Social Fund (ESF), the European Agricultural Fund for Rural Development (EAFRD), the European Maritime and Fisheries Fund (EMFF) and the Cohesion Fund.

This report concerns the Strategic Environmental Assessment (SEA) of the Rural Development Programme for Wales.

[1] A part of the Welsh Government which is also the Managing Authority for the ERDF and ESF in Wales.

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GLOSSARY OF ACRONYMS AND THEIR MEANINGS

AONB	Area of Outstanding Natural Beauty, a landscape designation under the National Parks and Access to the Countryside Act 1949.
BAP	Biodiversity Action Plan. Initially the UK government's response to the Convention on Biodiversity 1992 as its plan to halt biodiversity loss. Each of the UK nations now has its own BAP, as do all the local authorities (known as local biodiversity action plans or LBAPs). In Wales there are currently 24 of these. BAPs are non-statutory documents.
Cadw	The name given to the Welsh Government's statutory body for the protection of Wales' built heritage, ancient monuments and sites.
CAP	Common Agricultural Policy. The EU's overarching policy for ensuring a fair standard of living for farmers and to provide a stable and safe food supply at affordable prices to consumers.
CCT	Cross-cutting themes, a term used in the context of the Structural Fund programmes to denote compliance in terms of sustainable development, equal opportunities and poverty alleviation.
CEH	Centre for Ecology and Hydrology. Carries out research into biodiversity and ecosystems.
COMAGRI	The European Parliament Committee on Agriculture and Rural Development.
CCW	The Countryside Council for Wales, the Welsh Government's previous statutory body for the protection of biodiversity and landscape and the promotion of access to the countryside (integrated into Natural Resources Wales April 2013).
CO_2	Carbon Dioxide, a greenhouse gas emitted when burning fossil fuels.
DEFRA	The Department for Environment, Food and Rural Affairs for the United Kingdom. Defra represents the UK's agriculture, fisheries, environment and rural community interests in Europe.
DG	Directorate-General, one of 32 departments of the European Commission.
EA	The Environment Agency, a non-departmental public body whose main duty was to safeguard the quality of air and the quality and availability of water prior to its integration into Natural Resources Wales.

EAFRD	The European Agricultural Fund for Rural Development
EAU	The Welsh Office Environmental Unit, a department of the Welsh Department prior to the establishment of the Welsh Assembly Government.
EC	The European Community
EEC	The European Economic Community
EIA	Environmental Impact Assessment (in the context of this document), a statutory assessment of the significant environmental effects of a plan or project, and the measures to avoid, mitigate or compensate, or to enhance the environment as an outcome. Operates under the terms of the EIA Directive 337/85/EEC.
ERDF	European Regional Development Fund, one of the EU's two structural funds. A financial tool designed to reduce disparities by creating sustainable jobs, economic development, research and development, environmental protection and risk management.
ESF	European Social Fund, also one of the EU's two structural funds. A financial tool designed to reduce disparities by promoting adaptability, access to employment, and social inclusion for disadvantaged people.
EU	The European Union.
FSC	The Forestry Stewardship Council, an international organisation set up to promote the sustainable use of the world's forests. Sets standards and certifies and labels forest products.
GAEC	Good Agricultural and Environmental Condition, a set of standards applied under the Agri-environment scheme
gha	Global hectares, the measure of a population's ecological footprint.
GHG	Greenhouse gas or gases. As well as carbon dioxide, greenhouse gases include water vapour, methane, nitrous oxide and ozone, all of which contribute to the 'greenhouse' effect by absorbing and emitting radiation within the thermal infrared range.
GVA	Gross Added Value, an economic measure of the total value of goods and services produced in an area, sector or industry.
HRA	Habitat Regulations Assessment, a statutory assessment of the likely significant effects of a proposal on any site that is of European

	conservation interest (see SAC, SPA and Ramsar Site), under the terms of the Habitats Directive (92/43/EC).
ICOMOS	The International Council of Monuments and Sites, a professional association that offers advice on the protection and conservation of cultural heritage sites and structures around the world.
ICT	Information and Communications Technology.
IMD	Index of Multiple Deprivation, a UK qualitative study of deprived areas in UK local councils. Based on a range of criteria including access to services and healthy environments.
IUCN	The International Union for the Conservation of Nature, a governmental and non-governmental forum that aims to find pragmatic solutions to environment and development challenges. It is the world's oldest and largest environmental network.
kWh/d/p	Kilo-watt hours per day per person, a measure of energy use.
LAG	Local Action Group. Volunteers from public, private and voluntary sector groups promoting community-led initiatives to deliver RDP funding.
LBAP	Local Biodiversity Action Plans identify local priorities for biodiversity conservation, produce action plans and targets to deliver protection on priority habitats and species.
LDP	Local Development Plan, the statutory local authority spatial plan policy document.
LFA	Less Favoured Area, a term used to describe an area with natural handicaps such as a lack of water, climate, or short growing season. Hilly areas with steep slopes are also designated LFAs.
LNR	Local Nature Reserve, a local authority level designation for biodiversity sites of local value.
LULUCF	Land use and land use change and forestry, a sector defined by the United Nations as 'a greenhouse gas inventory sector that covers the emission and removal of greenhouse gases resulting from direct human-induced land use, land change and forestry activities.'
NEA	National Ecosystem Assessment, an initial assessment of the state of a nation's ecosystems, their services to human well-being, and a description of pressures and trends likely to influence their future condition.

NGO	Non-governmental organisation.
NNR	National Nature Reserve, a statutory designation that protects the features of a site from potentially damaging operations, whether directly or indirectly.
NRW	The new single environmental body for Wales, Natural Resources Wales - comprising the erstwhile Forestry Commission, Countryside Council for Wales and Environment Agency Wales.
NSRI	National Soil Research Institute.
NUTS3	Nomenclature of Territorial Units for Statistics 3. A geocode standard for measuring land subdivisions. Used by the EU for assessing delivery of programmes.
NVZ	Nitrate Vulnerable Zone, an Environment Agency designation for areas that drain into existing or potential nitrate polluted waters. The threshold for nitrate polluted water is 50mg NO_3/litre.
OECD	The Organisation for Economic Development, an international organisation of 34 states, established to stimulate economic growth and free trade.
ODPM	The Office of the Deputy Prime Minister.
PGI	Protected Geographical Indication, a European product designation, designed to authenticate a brand and link it to a region, protecting it from other similar products.
R&D	Research and Development.
Ramsar	A site that is designated for its importance to migrating water birds and waders, under the Ramsar Convention signed in 1971 and coming into force in 1975. The UK has the highest number of Ramsar sites globally.
RDP	Rural Development Plan.
RSPB	The Royal Society for the Protection of Birds, a conservation NGO.
SAC	Special Area of Conservation, a designation for habitats and species requiring special protection as a site of European conservation interest under the Habitats Directive (92/43/EC).
SDA	Severely Disadvantaged Area, a designation within the Less Favoured Area subject to enhanced support by virtue of especially severe agricultural constraints.

SEA	Strategic Environmental Assessment.
SF	Structural Fund(s) are the financial tools set up to reduce regional disparities across the EU. The structural funds are the European Regional Development Fund and the European Social Fund.
SME	Small to medium enterprise. Three categories are defined by the European Commission: 'micro', with a staff of fewer than10 and/or a turnover/balance sheet total of less than €2m; 'small', with a staff of fewer than 50 and/or a turnover/balance sheet total of less than €10m, and 'medium' , with a staff of fewer than 250 and/or a turnover/balance sheet total of less than €50m/€43m.
SoE	State of the Environment. An assessment of the environmental condition, pressures, responses and trends of a defined area, whether local or global.
SPA	Special Protection Area, a site or area designated for the protection of birds requiring special measures. As in the case of SACs (see above) these are sites of European conservation interest, established under the Birds Directive (79/409/EEC).
SSSI	Site of Special Scientific Interest, a statutory designation that protects the natural interest of a site from potentially damaging interventions, whether directly or indirectly.
SUDS	Sustainable Urban Drainage Systems.
TEN-T	The Trans-European Transport Network, a transport infrastructure and traffic management system that incorporates rail, road, inland waterways, sea and air transport. Its aim is to facilitate ease of transport and travel across Europe.
UK	The United Kingdom of Great Britain (England, Scotland and Wales) and Northern Ireland.
UNESCO	The United Nations Educational, Scientific and Cultural Organisation.
US	The United States of America.
WAG	The Welsh Assembly Government, otherwise known as the National Assembly for Wales, is the Welsh legislature established by the Government of Wales Act in 1998.
WEFO	The Welsh European Funding Office.
WFD	The Water Framework Directive.

WG The Welsh Government, the executive of the Welsh Assembly Government, established by the Government of Wales Act 2006.

GLOSSARY OF TERMS

Avoidance In the context of this report, avoidance is used to mean a decision not to proceed with a project in order to avoid an impact; to relocate a project in order to avoid an impact; or to manage a project in such a way that it avoids an impact that may be seasonal in nature.

Cumulative or synergistic In the context of this report, cumulative effects are effects which alone do not result in a significant impact, but collectively do so. For example the cumulative effect of a number of acceptable developments, or discharges that individually do not have a significant impact. Synergistic effects are those that are not simply cumulative, but result in a further effect that may be positive or negative. The effects of chemical cocktails in a river may be synergistic, as may be the economic and social effects of interventions.

Ecological footprint An indicator of the demands made on the environment by a population, measured in global hectares. The ecological footprint for Wales in 2006 was about 4.4 gha. In other words, the population is consuming the equivalent of 4.4 'planet earths'.

Environmental Assessment A method or procedure for predicting the effects on the environment of a proposal, either for an individual project or a higher-level strategy (a policy, plan or programme), with the aim of taking account of these effects in decision-making. The term “Environmental Impact Assessment” (EIA) is used, as in European Directive 337/85/EEC, for assessments of projects. In the SEA Directive, an environmental assessment means “the preparation of an environmental report, the carrying out of consultations, the taking into account of the environmental report and the results of the consultations in decision-making and the provision of information on the decision”, in accordance with the Directive’s requirements.

Environmental Report A key output of the SEA process as required by the SEA Directive. Sets out to identify, describe and evaluate the likely significant effects on the environment of implementing a plan or programme.

Ex-Ante Evaluation The process of evaluating the overall effects of a programme prior to its adoption. Carried out in parallel with the development of a programme, in order to inform it in terms of likely outcomes in order to optimise its implementation.

Glastir The Welsh agri-environment scheme, comprising an All Wales entry level element which is accessible to all farmers, an upper level Targeted element which

targets issues of concern in pre-defined priority areas, a Common Land element, the ACRES (Agricultural Carbon Reduction and Efficiency Scheme) capital grant element and a stand-alone Woodland Creation element.

Indicator A measure of variables over time, used in this case to measure the extent to which objectives are being attained.

Mitigation Used in this case to refer to measures to reduce or offset significant adverse effects on the environment.

Objective: A statement of what is intended, specifying the desired direction of change as a result of interventions.

Plan or Programme: The term “plan or programme” covers any plans or programmes to which the SEA Directive applies.

Responsible Authority: The organisation which prepares a plan or programme subject to the Directive and is responsible for the SEA. In this case WEFO is the responsible authority.

Scoping: The process of determining the extent and level of detail of an SEA, including the environmental effects and alternatives which need to be considered, the assessment methods to be used, and the structure and contents of the Environmental Report.

Screening: The process of deciding whether a plan or programme requires SEA.

Strategic Environmental Assessment (SEA): Generic term used to describe environmental assessment as applied to policies, plans and programmes. In this report, “SEA” is used to refer to the type of environmental assessment required under the SEA Directive.

SEA Directive: European Directive 2001/42/EC “on the assessment of the effects of certain plans and programmes on the environment”.

SEA Regulations: The regulations transposing the SEA Directive into law, namely The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004.

1 INTRODUCTION

1.1 Purpose

1.1.1 This Strategic Environmental Assessment (SEA) report of the Wales Rural Development Plan ('the RDP') has been produced by Bangor University in association with Old Bell 3 Ltd on behalf of the Welsh European Funding Office (WEFO).

1.1.2 The assessment has been carried out in accordance with the requirements of the European SEA Directive (2001/42/EC) and the implementing regulations for Wales, the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 (Welsh Instrument 2004 No. 1656 (W.170)). We have also considered the provisions of Statutory Instrument 2007/2933, the Environmental Impact Assessment (Agriculture) (Wales) Regulations 2007.

1.1.3 The objective of the SEA Directive is

" to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes […] by ensuring that […] an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment."[2]

1.1.4 Articles 3(2)(a) and 3(4) apply the legal obligation to carry out an SEA to the Rural Development Programme. Furthermore, article 3(2)(b) of the Directive requires an environmental assessment to be undertaken for plans and programmes requiring assessment under article 6 or 7 of the Habitats Directive.[3]

1.1.5 This SEA has been carried out in conjunction with the development of the RDP and its overall Ex-Ante Evaluation. It aims to ensure that the RDP contributes positively to a high level of environmental protection, as well as supporting the goal of the Welsh Government of working towards sustainable development. It does this:

- by setting out the environmental parameters within which the RDP will operate;

[2] Article 1 of the SEA Directive 2001/42/EC of 27 June 2001

[3] Council Directive 92/43/EEC of 21 May 1992

- by identifying, describing and assessing likely significant effects on the environment arising from the RDP's implementation;
- by considering reasonable alternatives.

1.1.6 The purpose of this SEA is therefore is to inform the development of the RDP prior to its adoption, and to provide an environmental context for its implementation.

1.1.7 Possibly the most important function of the SEA is to influence strategic changes that might result from the assessment. Changes should have already occurred by the time that the report is finalised, confirming that the right approach has been taken to the SEA process, namely that it has been used to improve the environmental performance of the programme, rather than merely presenting a snapshot of it.[4]

1.2 SEA requirements

1.2.1 This Environmental Report complies with the requirements of the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 (Welsh Instrument 2004 No. 1656 (W.170)).

Table 1 identifies those sections within the Environmental Report that relate to the specific requirements of Regulation 12 and Schedule 2 of the Regulations.

Table 1: References to the SEA Regulations

Environmental Report - Information to be included	Relevant Section
1. An outline of the contents, main objectives of the plan, and of its relationship with other relevant plans and programmes.	**Section 4, page 88**
2. The environmental characteristics of areas likely to be significantly affected.	**Section 3, page 33**
3. Any existing environmental problems which are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC.	**Section 3.21, page 84**
4. The environmental protection objectives, established at international,	**Appendix 2**

[4] "Getting the most from your RDP. Guidelines for the Ex-Ante evaluation of 2014-2020 RDPs." Draft August 2012.European Evaluation Network for Rural Development. DG Agriculture and Rural Development.

Community or Member State level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation.	
5. The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects, on issues such as: biodiversity; population; human health; fauna; flora; soil; water; air; climatic factors; material assets; cultural heritage including architectural and archaeological heritage; landscape; the interrelationship between the above factors.	**Section 5, page 101** **Annex 6**
6. The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan.	**Section 7, page 121**
7. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken.	**Section 6, page 114**
8. A description of measures envisaged concerning monitoring in accordance with Regulation 17.	**Section 8, page 124**
9.. A non-technical summary of the information provided under paragraphs 1 to 9.	**Accompanying document**

1.3 SEA process prior to the Environmental Report

1.3.1 An **initial meeting** was held on 10 December 2012 in Cardiff to determine the broad nature and scope of the structural fund programmes and the rural development plan and to establish a timetable for developing the SEA and consultation.

1.3.2 Subsequently, a **Screening Report** was produced on 4 January 2013 for consultation with the statutory bodies (the then Environment Agency and Countryside Council for Wales and Cadw), in accordance with the requirements of the SEA Directive, in order to determine the need for a full SEA of the RDP. It was confirmed that, owing to the potentially significant effects that could arise from the proposals, a full SEA was required.

1.3.3 A meeting was held with the then Countryside Council for Wales to discuss our approach to the SEA in terms of biodiversity concerns.

1.3.4 A **Scoping Report** was produced on 13 February 2013. WEFO subsequently organised a series of consultation events to engage stakeholders in the development of the 2014-2020 SF and RDP operational programmes. As part of these events, stakeholders were given the opportunity to comment on the emerging Environmental Reports.

1.3.5 A draft Environmental Report was produced in response to these consultations and this report was consulted upon as part of the consultation entitled 'The Common Agricultural Policy Reform. Rural Development Plan 2014-2020: Next Steps' between 31st January and 23rd April 2013[5]. The draft ER has been further amended to take account of consultation responses and in parallel with adjustments to the RDP during 2013. A second draft report was produced in March and April 2014, in parallel with the final proposals contained in the consultation document issued 17 February 2014[6].

1.3.6 This report has been produced in order to reflect the most recent (June 2014) revisions to the RDP and in response to the above consultation.

1.4 The SEA and other EU Directives and Standards

1.4.1 The SEA Directive applies to programmes and plans that may be developed at national or at local levels. Land use plans, river basin management plans and programmes of measures under the Water Framework Directive, Shoreline Management Plans, Catchment Flood Management Plans, National Park Management Plans and so on are all subject to the provisions of the SEA Directive.

1.4.2 Other forms of environmental impact assessment under the EIA Directive[7] allow a detailed assessment of the key environmental issues

[5] A summary of the responses in relation to the consultation on the RDP Environmental Report has been published by Welsh Government. The analysis in relation to the ER is on page 77-81. A full list of respondents to the consultation is also provided at Appendix 1 of this report (page 84). Stakeholders that responded specifically on the Drat ER included BSW Timber, Ceredigion Sustainable Futures Executive Group and Ceredigion County Council, CLA Cymru, Institute of Historic Building Conservation (IHBC), Natural Resources Wales, Sustainable Gwynedd Cynaladwy and the Welsh Local Government Association. The full consultation analysis report can be found at:
http://wales.gov.uk/docs/drah/consultation/130306capnextstepsresponsesreporten.pdf

[6] Number WG 20644

[7] Council Directive 85/337/EEC as amended and codified by 2011/92/EU

identified for proposals at project level, most regularly within the statutory spatial planning system.

1.4.3 Agriculture and Forestry have their own statutory assessment provisions, including the Environmental Impact Assessment (Agriculture) (Wales) Regulations 2007, and the Environmental Impact Assessment (Forestry) (England and Wales) Regulations 1999.

1.4.4 Of some importance at farm scale is the set of EU Good Agricultural and Environmental Condition (GAEC) standards[8] that provide a baseline of environmental protection for soil and water, habitats and landscape features. GAEC 5 in particular supports the provisions of the above regulations, in relation to increasing the productivity of uncultivated or semi-natural land. Other GAEC standards apply to the protection of hedgerows, water courses, buffers zones, grazing, heather and grass burning and so on.

1.4.5 European Directive 92/43/EEC on the 'Conservation of Natural Habitats and Wild Fauna and Flora', referred to as the 'Habitats Directive', provides legal protection for habitats and species of European importance[9]. Article 2 of the Directive requires the maintenance or restoration of habitats and species of European Community interest, at a favourable conservation status.

1.4.6 Articles 3 - 9 provide the legislative means to protect habitats and species of Community interest. In particular, Article 6 (3) of the Directive states:

"*Any plan or project not directly connected with, or necessary to, the management of the [European] site, but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives*".

1.4.7 A 'European site' includes Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). For the purposes of Habitats Regulations Assessment in Wales, the Welsh Government also expects plan making to treat all Ramsar sites, candidate SACs (cSACs) and

[8] Described in Annex III of Council Regulation 73/2009

[9] Council Directive 92/43/EEC of 21st May 1992 on the conservation of natural habitats and of wild fauna and flora

potential SPAs (pSPAs) in the same manner as European sites when considering the implications of development plans[10].

1.4.8 The Directive is transposed into Welsh law by the Conservation (Natural Habitats etc) Regulations 1994. Following a judgment of the European Court of Justice[11], consolidated regulations were laid before the National Assembly for Wales in March 2010[12], replacing all the earlier versions.

1.4.9 The purpose of Habitats Regulations Assessment is to ensure that any plan or project, alone or in combination with other plans or projects, shall not have an adverse impact on the integrity of European sites, and that competent authorities shall agree to a plan or project after ascertaining that it will not affect the site concerned.

1.4.10 In this context the screening report on the Wales Spatial Plan[13] concluded that:

'...it was not possible to confirm that the Wales Spatial Plan, alone or in combination with other plans or projects, would not have a significant effect on European and international sites in Wales, its offshore waters and across the border in England'..[14]'

An assessment under the Habitats Regulations was subsequently carried out to consider the likelihood and significance of impacts resulting from the plan and/or from any programmes that arise from it.

1.4.11 The Welsh Government's Flood and Coastal Erosion Risk Management Strategy (June 2011) stated that its strategy:

'...is a very high-level document without a spatial basis, therefore potential impacts of the strategy itself on European sites is difficult to determine. However, the strategy sets out broad policies to be implemented by subsequent lower level plans and strategies, and also sets the strategic framework to influence individual flood risk and coastal erosion works,

[10] Annex 6: the Appraisal of Development Plans in Wales under the provisions of the Habitats Regulations.

[11] ECJ case C – 6/04, Commission of the European Communities v United Kingdom of Great Britain and Northern Ireland, 20th October 2005

[12] The Conservation of Habitats and Species Regulations 2010

[13] Wales Spatial Plan Update. Habitats Regulations Assessment &Appropriate Assessment. June 2008

[14] Wales Spatial Plan 2008 update. Welsh Assembly Government. Pages 7-8

which could potentially result in significant effects on European sites. It is therefore considered that the strategy does fit within the definitions of a 'plan' as defined by the Habitats Directive[15]'

1.4.12 Glastir is Wales' agri-environment scheme. One of its stated purpose of is to promote the conservation of designated biodiversity sites[16], as well as biodiversity and ecosystems beyond them. The explicit nature of its strategic proposals would indicate that it would fall within the scope of Article 6(3) of the Habitats Directive.

[15] Flood and Coastal Erosion Risk Management Strategy (June 2011). Welsh Assembly Government. p7

[16] See for example National Assembly for Wales (2011). Introduction to Glastir. p3

2 SEA PROCESS AND ASSESSMENT METHODOLOGY

2.1 Approach and overall SEA tasks

2.1.1 The approach that has been adopted is based on a number of advisory documents, chiefly the guidelines of the former Office for the Deputy Prime Minister (ODPM) 2005[17], and the EC's guidance documents on implementing the SEA Directive[18] and RDP Ex-Ante Evaluation guidance 2012[19]. Note was also taken of guidance provided by the Environment Agency[20], the Countryside Council for Wales[21], RSPB[22], and the Scottish Executive[23].

2.1.2 Table 2 describes the SEA stages and tasks.

Table 2: SEA stages and tasks

STAGE	TASK
Setting the context and objectives	• *Establish the baseline and decide on the scope.* • *Identify/review relevant policies, plans and programmes and sustainable development objectives that will affect or influence the programme.* • *Collect relevant baseline information.* • *Identify key issues for the SEA to address and define objectives.* • *Develop SEA framework, objectives, indicators and targets.* • *Test the plan or programme objectives against the sustainability objectives and whether the programme objectives are consistent with one another.*

[17]"A Practical Guide to the Strategic Environmental Assessment Directive". ODPM 2005.

[18]"Implementation of Directive 2001/42 on the Assessment of the Effects of Certain Plans and Programmes on the Environment". European Commission DG Environment. Undated.

[19]"Getting the most from your RDP. Guidelines for the Ex-Ante evaluation of 2014-2020 RDPs." Draft August 2012. European Evaluation Network for Rural Development. DG Agriculture and Rural Development.

[20] "Strategic Environmental Assessment and Climate Change: guidance for practitioners". Environment Agency. August 2011.

[21]"Strategic Environmental Assessment. Guidance for Practitioners". Countryside Council for Wales. SEA Guidance Note series. August 2007.

[22] "Strategic Environmental Assessment. Learning from Practice". RSPB. Undated.

[21] "Strategic Environmental Assessment Toolkit". Natural Scotland. Version 1 September 2006.

	• *Produce scoping report and undertake consultation with the consultation bodies.*
Developing and refining the options	• *Carry out appraisal of the proposed programme options and make recommendations for improvement.*
Appraising the effects of the draft programme	• *Predict effects and carry out assessment of the effects of the draft programme* • *Propose measures to maximise benefits and mitigate adverse effects.* • *Develop proposals for monitoring.* • *Prepare the Environmental Report of the draft programme.*
Consulting on the Environmental Report and draft programme	• *Consult on the Environmental Report along with the draft programme.* • *Carry out appraisal of significant changes made as a result of consultation.*
Monitoring and Implementing the programme	• *Inform consultees that the programme has been adopted.* • *Issue statement summarising information on how the SEA results and consultees' opinions were taken into account, etc.* • *Make programme and final Environmental Report available for public viewing.*

2.2 Challenges in undertaking the SEA

2.2.1 The assessment was constrained by two key factors:

- The proposed RDP is not spatial, but provides generic descriptions of the kind of activities likely to be supported. It can therefore be difficult at times to envisage potential significant environmental effects with certainty, and therefore a precautionary approach has been taken to the assessment of effects.

- The plan is defined by the need to prioritise regional economic activity based on available funding and the timescale over which it will operate. Therefore, the identification and discussion of *reasonable* alternatives is limited to the themes or combinations of themes, the

timescales and priorities within the Plan. Any discussion of alternative priorities, timescales or themes would be irrelevant.

2.3 Development of SEA objectives

2.3.1 Whilst there is no requirement under the SEA Directive to produce objectives or indicators as part of the SEA process, their use is promoted as an appropriate tool for identifying and assessing potential environmental effects, both positive and negative.

2.3.2 The objectives were developed from a review of literature that included:

- European Commission Core Indicators[24]
- EU2020 targets and Lisbon Structural Targets and Indicators[25]
- EU 6th Environmental Action Plan & Sustainable Development Strategy[26]
- The draft 2014-2020 programme consultation documents and thematic working group papers[27]
- The Welsh Government: Programme for Government[28]
- Wales Environment Strategy[29]
- Wales National Ecosystem Assessment[30]

[24]European Commission. Programming period 2014-2020. Monitoring and evaluation of European cohesion policy - European Regional Development Fund and Cohesion Fund. Concepts and Recommendations. Guidance document. November 2011. (http://ec.europa.eu/regional_policy/information/evaluations/guidance_en.cfm#1)

[25] Communication from the Commission. Europe 2020 - a strategy for smart, sustainable and inclusive growth. (http://eur-lex.europa.eu/LexUriServ/LexUriServ. do?uri= COM: 2010: 2020: FIN:EN:PDF) (see also http://ec.europa.eu/ europe2020/pdf/targets_en.pdf for specific targets). See also http://epp.eurostat.ec.europa.eu/portal/page/portal/structural_indicators/indicators/environment on Lisbon environment indicators

[26]Decision No 1600/2002/EC of the European Parliament and the Council laying down the sixth community environmental action programme. July 2002.(http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:242:0001:0015:EN:PDF)Summary and explanation. (http://europa.eu/legislation _summaries/ agriculture/ environment/l28027_en.htm)

[27]The consultation documents issued 4 March 2013: situation analysis and next steps; water thematic report 14/11/2012; forestry thematic report 25/10/2012; agri-environment-organic report (undated); biodiversity report 26/10/2012

[28] Programme for Government. Welsh Government. 2011 (http://wales.gov.uk/docs/strategies/ 110929fullen.pdf & http://wales.gov.uk/docs/strategies/120528fullen.pdf)

[29]WAG Cardiff. Environment Strategy Action Plan October 2008. (http://wales. gov.uk/ desh/publications/enviroprotect/environmentstrategy/environmentactionplan/esap0811e.pdf;jsessionid=7D4C112D25E2CF42B4AD153E9C57CDA0?lang=en)

- 2007-13 Rural Development Plan Strategic Environmental Assessment[31]
- Wales Spatial Plan[32]
- Sustainable Development Indicators for Wales[33]

2.3.3 The management plans of Wales' protected landscapes were reviewed in order to confirm the scope of environmental objectives, and to highlight any new objectives not identified already.

2.3.4 The range of comments on the SEA of the 2007-2013 RDP proposal were reviewed, including those from NFU Cymru, FUW, CCW and RSPB[34], as well as submissions to the subsequent Glastir Stocktake[35].

2.3.5 Parallel to this process was the development of 52 questions based specifically on the key issues that emerged from the environmental baseline.

Table 3: Overarching environmental questions

In its delivery, will the Programme...	
• *increase levels of light pollution?* • *increase levels of noise pollution?* • *reduce health inequalities among different groups in the community?*	Population and human health
• *protect and enhance rare or endangered species and habitats and provide opportunities for habitat creation/restoration?* • *protect habitats and minimise the fragmentation of nature corridors and networks in accordance with Biodiversity Action Plans?* • *avoid damage to sites of geological interest?* • *avoid damage to sites of European conservation value and enhance them where possible?*	Biodiversity
• *protect and enhance landscape and seascape*	Landscape

[30]National Ecosystems Assessment (2011): Chapter 20: Status and Changes in the UK's Ecosystems and their Services to Society: Wales. World Conservation Monitoring Centre Cambridge.

[31] Agra CEAS Consulting/Collingwood Environmental Planning (2006): Annex to the ex-ante evaluation of the Wales Rural Development Plan: the Strategic Environmental Assessment. Draft Final Report.

[32] Welsh Assembly Government (2008): People, Places, Futures. The Wales Spatial Plan. 2008 update. July 2008. WAG Cardiff.

[33] Welsh Government (2012): Sustainable Development Indicators. WG Cardiff

[34] Appendix 3 to the 2006 SEA.

[35] Glastir Stocktake: A Report on the Findings. June 2012.

character?	

• *help to protect or enhance historic buildings, areas and areas of landscape/townscape character?* • *provide development patterns that do not harm the linguistic character of Welsh speaking communities?* • *encourage the mainstreaming of the Welsh language?* • *ensure settlements can absorb growth without damage to character?* • *promote and market locally sourced products?*	Culture, architecture and archaeology
• *avoid the loss of good quality soils to development?* • *maintain and enhance soil quality?* • *minimise soil erosion through run-off, wind and tillage?*	Soils
• *maintain levels of abstraction and recharge within the carrying capacity of the region?*	Water resource
• *maintain and enhance ground and surface water ecological and chemical quality?* • *improve the quality of coastal waters?*	Water quality
• *maintain and improve local air quality?*	Air quality
• *reduce greenhouse gas emissions?* • *contribute to the ability to adapt to the impacts of climate change?* • *reduce the use of fossil fuels?* • *maintain and where possible increase the capacity of land to sequester carbon?*	Climate issues
• *reduce or manage flooding?*	Flood risk
• *promote the use of recycled and secondary materials?* • *reduce the production of waste?* • *reduce the proportion of residual waste to landfill?* • *reduce hazardous waste?*	Waste management
• *deliver more sustainable location patterns?* • *reduce car traffic?* • *encourage walking, cycling and use of public transport?* • *improve access to and encourage the use of ICT?*	Transport infrastructure
• *improve farm welfare standards?* • *reduce stresses related to long distance transportation?* • *result in decreased risk of animal-animal/animal-human disease transmission?*	Animal welfare/disease transmission
• *provide support to endangered native breeds?*	Endangered breeds
• *reduce imported materials such as timber?* • *add environmental value to agricultural and forestry*	Forestry and woodland management

enterprises? • *minimise the risk from disease?* • *promote an increase in woodland diversity?*	

• *improve the quality and increase the quantity of publicly accessible open space?* • *improve the management of the impacts of access and recreation?* • *provide opportunities for people to come into contact with and appreciate wildlife and the natural environment?* • *promote tourism linked to wildlife/environment experiences?*	Rural based tourism
• *reduce the need for energy?* • *increase the production and/or use of renewable energy?* • *increase energy efficiency (e.g. energy efficiency in buildings, transport modes, etc)?*	Energy
• *seek to optimise multiple benefits from ecosystem management?* • *ensure sustainable use of raw materials (e.g. timber, fresh water, minerals)?* • *reduce the production/consumption chain?* • *overall reduce the ecological footprint of rural Wales?*	Interactions

2.3.6 The result of this process was the development of a set of high and local level generic objectives, which were distilled into 46 key objectives. In order to reflect the high level of the RDP, these were then aggregated into the 12 objectives against which the RDP was assessed. The key objectives were retained as sub-objectives.

2.3.7 It should also be noted that the objectives are not scored or weighted, since they are interdependent and potentially mutually reinforcing. However, it is recognised that *within* some objectives there is a hierarchy of priority concerns. For example the objective to 'protect and enhance biodiversity' implies that in some circumstances, *avoidance* must be the only option (in the case of ancient woodlands, say, or of designated habitats and species), whereas in others, *mitigation* and/or *compensation* might be appropriate. In any case, all mitigation and compensation measures must ensure an *enhancement* of the status quo wherever possible, should relate to any development proposal in terms of scale, and should be local to that proposal.

Table 4: SEA objectives and sub-objectives

Population and human health	Improve physical and mental health and reduce health inequalities	Minimise environmental nuisance such as noise pollution, and light pollution Promote access to the countryside Promote learning in, about and for farming and forestry Increase access to locally produced high quality foods
Biodiversity	Protect and enhance biodiversity	Avoid damage to sites of European conservation value and enhance them where possible Protect and enhance rare or endangered species and habitats and provide opportunities for habitat creation/restoration Protect habitats and minimise the fragmentation of nature corridors and networks in accordance with Biodiversity Action Plans, and improve these where possible Avoid damage to sites of geological interest Promote agri-diversity through support for endangered local breeds Promote indigenous woodland species Support biodiversity health through the management of disease and invasive species

Culture, architecture and archaeology	Protect places, landscapes and buildings of historic, cultural and archaeological value	Improve the quality of the local built environment Promote the re-use of previously developed land and buildings Protect village greens and community wildlife areas/ woodlands Promote and market locally sourced products Protect archaeological sites on farmland Protect and improve the stock of listed buildings
Soils	Protect soil quality and quantity	Maintain and enhance soil quality in terms of porosity, biota and structure Minimise soil erosion through run-off, wind and tillage Optimise the capacity of soils to sequester carbon
Water resource	Protect the water resource and ensure its sustainable use	Complete flood and coastal risk plans Promote technology to conserve and recycle water
Water quality	Protect and improve water quality	Protect and enhance the quality of groundwater, rivers, lakes, and coastal waters Comply with 'good' status under the Water Framework Directive (WFD) Protect and enhance salmonid and other fisheries Avoid physical disturbance to the water and water edge environment Reduce diffuse pollution from agriculture and other sources Ensure sustainable drainage systems in development
Air quality	Protect and improve air quality	Reduce atmospheric hazards such as ammonia, methane and carbon dioxide

Climate issues	Limit and adapt to climate change	Reduce emissions of greenhouse gases, especially N_2O and CH_4 Minimise the requirement for energy generation Promote efficient energy use Increase the use of energy from renewable resources including hydro-systems and biomass Promote ICT as an alternative to travel and print
Waste management	Minimise waste increase re-use, recycling and recovery rates	Restrict biodegradable materials going to landfill Promote anaerobic digestion Promote the use of organic waste to agriculture where appropriate
Transport infrastructure	Minimise the need to travel; provide alternatives to car use	Protect and enhance the public transport system Optimise opportunities to work locally Promote non-recreational walking and cycling
Animal welfare/disease transmission	Maintain and enhance animal welfare standards	Improve on-farm animal welfare standards Reduce stresses related to transportation Minimise transportation distances Minimise the risk of animal-animal/animal-human disease transmission

Rural based tourism and access	Optimise opportunities for rural tourism whilst minimising negative impacts	Optimise opportunities for links to wildlife/food production Protect and enhance access to the coastline and countryside Protect rights of way, open space, and commons

2.4 Development of SEA indicators

2.4.1 The indicators were adapted from the review of literature, as shown in Appendix 3, and linked to the 46 key objectives identified above. The indicators and the objectives to which they relate are shown in section 8, on monitoring.

2.4.2 It should be noted that the RDP provides its own indicators, based on Commission core indicators and specific programme indicators[36]. These are separate to the indicators referred to in relation to the SEA, and include, for example, a number of economic indicators that are not relevant to this report[37].

Figure 1: Overview of impact indicators

1	*Agricultural entrepreneurial income*	*EU/MS level*
2	*Agricultural factor income*	*EU/MS level*
3	*Agricultural productivity*	*EU/MS level*
4	*EU commodity price variability*	*EU level*
5	*Consumer price evolution of food products*	*EU/MS level*
6	*Agricultural trade balance*	*EU level*
7	*GHG emissions from agriculture*	*EU/MS level*
8	*Farmland birds index*	*EU/MS level*
9	*HNV Farming and Farmland*	*EU/MS/Regional level*
10	*Water abstraction in agriculture*	*EU/MS/Regional level*
11	*Water quality*	*EU/MS/Regional level*
12	*Soil quality*	*EU/MS/Regional level*

[36] Monitoring and Evaluation for the CAP post 2013. Y. Plees - Agri. L.4. PowerPoint presentation to the 12th Expert Committee on Evaluation of Rural Development Programmes. Brussels 20/09/2012

[37] *ibid.*

13 Soil erosion	*EU/MS/Regional level*
14 Rural employment rate	*EU/MS/Regional level*
15 Degree of rural poverty	*EU/MS level*
16 Rural GDP per capita	*EU/MS level*

2.5 Assessment methodology

2.5.1 The assessment consists of analysing each of the elements within the RDP's key measures (as described in section 4.4 and Table 8) against the objectives of the SEA, based on a range of criteria (see section 2.6 and Table 5) derived from the Directive and supporting guidance. The results of this analysis were aggregated and set out as a basic compatibility test, as illustrated in section 5.1.

2.5.2 Finally, levels of risk were assessed for proposals that appeared to produce a negative effect when matched against the SEA objectives.

2.5.3 Risk was assessed for the *likelihood* of a negative effect occurring, and the *significance* of the effect should it occur as a result of the proposed intervention. This element highlights the need for avoidance through regulation, mitigation or compensation, or a combination of them (section 2.6.6).

2.6 Criteria for analysis

2.6.1 The criteria for the detailed analysis were developed on the basis of advice given in the ODPM guidance document, which refers to *'...scale and permanence and the nature and sensitivity of the receiving environment.'* (p.32) and the advice given by DG Environment[38]

2.6.2 Some proposed interventions may be *irrelevant* to the SEA objective, and we indicate where we judge this to be the case. In some cases this may be not known, in which case it will be indicated as such. Where a proposed intervention may be relevant, this is indicated as having a *direct* effect, an *indirect* effect, and/or an effect that may be *cumulative* or *synergistic.*

2.6.3 Such effects may be *negative* or *positive*, and these may differ in degree, so as to indicate very positive or very negative impacts.

2.6.4 Assessment also needs to be made with reference to *spatial extent*, that is whether the effect is likely to be local, regional, national or international;

[38] "Implementation of Directive 2001/42 on the Assessment of the Effects of Certain Plans and Programmes on the Environment". DG Environment. Undated.

and to *duration*, that is whether the effect is likely to be short (1-2 years), medium (3-5 years), long (6+ years) term or permanent.

2.6.5 These criteria are described below (Table 5), and were used to carry out the detailed analysis of effects. Appendix 6 tabulates this analysis in detail.

Table 5: Criteria used for analysis of effects

Reference	Symbol	Description
Irrelevant		An indicative activity is judged not to impact on the SEA objective.
Unclear	**?**	Difficult to envisage an impact, but limited confidence that there will be no impact.
Direct	**Dir**	There will be a discernible change to an aspect of the environment directly resulting from implementing an activity.
Indirect	**Ind**	There will be a discernible 'downstream' or 'parallel' change to another aspect of the environment, as a result of implementing an activity.
Cumulative/synergistic	**CS**	There will be a discernible change to an aspect of the environment arising from a number of anticipated activities.
Negative	**x**	There will be a loss or reduction in the integrity of an aspect of the environment.
Positive	✓	There will be an increase in the integrity of an aspect of the environment.
Short term	**ST**	Any discernible change to an aspect of the environment as a result of an activity is likely to last from 1-2 years
Medium term	**MT**	Any discernible change to an aspect of the environment as a result of an activity is likely to last for 3-5 years
Long term	**LT**	Any discernible change to an aspect of the environment as a result of an activity is likely to last beyond the life of the Programme (6+ years) but will not be permanent
Permanent	**P**	Any discernible change to an aspect of the environment as a result of an activity is likely to be permanent

2.6.6 A risk analysis of potentially negative effects used was tabulated using the symbols and criteria shown here:

Definite	**Def**	The effects will be inevitable unless remediated in some way.
Probable	**Prob**	These effects are likely to occur as a result of the implementation of an indicative action.
Possible	**Poss**	These effects may occur as a result of the implementation of an indicative action.
Unlikely	**Unl**	Effects are unlikely to occur as a result of the implementation of an indicative action alone.

Low	Any effect arising from a proposed intervention is likely to be minimal. No adaptation of the Programme is anticipated.
Moderate	Any effect arising from a proposed intervention is likely to be significant. The Programme may require adaptation.
High	Any effect arising from a proposed intervention is likely to be substantial. The Programme will require adaptation.

2.7 Links to other programmes, policies and assessments

2.7.1 As well as those documents listed above (sections 2.3.2 and 2.3.3) which specifically informed the development of objectives and indicators, a number of other European, UK and Wales-level plans, programmes and policies were reviewed, in order to identify further links between the RDP and other plans, policies and programmes, and to provide information on priorities and environmental issues. A summary of that review can be found in Appendix 2.

2.7.2 Whilst the full list is too lengthy to provide in full, the following key Wales policy documents have informed this report:

- One Wales One Planet
- Wales Spatial Plan
- Environment Strategy
- Tourism strategy
- Transport Strategy
- Waste Strategy
- Energy Policy Statement
- Climate Change Strategy
- Coastal Flood Erosion Strategy
- Historic Environment Strategy
- Sustaining a Living Wales
- Farming, food and countryside: building a secure future
- Woodlands for Wales
- Sustainable Tourism
- Energy Wales: a Low Carbon Transition

- Unlocking the Potential of the Uplands

2.7.3 In addition, a number of Welsh theme-specific SEA's were reviewed to provide further information:

- Environment Agency: Western Wales River Basin District Management Plan SEA.
- Welsh Government. Flood and Coastal Erosion Risk Management: National Strategy. Habitat Regulations Assessment.
- North Wales Regional Waste Group. Strategic Waste Management Options SEA.
- Welsh Assembly Government. National Transport Plan SEA.
- Forestry Commission Wales. Woodlands for Wales Strategy. Voluntary SEA.
- Welsh Assembly Government. Wales Spatial Plan Update. SEA Statement.

3 ENVIRONMENTAL BASELINE AND ISSUES

3.1 Introduction

3.1.1 The scoping process sought to identify the key environmental issues that will influence the development of the RDP, and to highlight those issues that are relevant to the achievement of its objectives. This section describes the current state of the environment in Wales, in order to provide a context for understanding the potential for both positive and negative effects that may arise from the Plan's implementation.

3.1.2 Although the Plan is not spatially defined, certain landscapes and habitats are identified for funding, including upland landscapes including moorland, blanket bog, woodlands and wetland/river systems, a number of which are Natura 2000 sites. The linkages between the wide range of Welsh ecosystems need to be recognised, so that measures related to water conservation in the uplands will have an effect on coastal and marine ecosystems. The baseline is as inclusive as is reasonably possible, since it cannot be assumed that certain environmental elements will not be influenced, directly or indirectly, by the Plan.

3.2 Sourcing baseline data

3.2.1 The State of the Environment Statistical Bulletin (2012) provides an annual summary on a range of topics reviewing the state of the environment and allocates them a status based on their long term trends[39]. The results for individual indicators are in the 'State of Environment Report' that is published alongside the bulletin. In addition to the report, data is available via the StatsWales website[40]. Some of the statistics in the State of the Environment report correspond to, or are similar to some of the Welsh Government's Sustainable Development Indicators[41].

3.2.2 Of particular interest were the statistical reports on waste[42], population[43], rural Wales[44], and agriculture[45].

[39] See http://wales.gov.uk/topics/statistics/theme/environment/?lang=en (accessed 04/02/2013)

[40] See https://statswales.wales.gov.uk/Catalogue/Environment-and-Countryside (accessed 04/02/2013)

[41] See http://wales.gov.uk/topics/statistics/headlines/sustaindev/120829/?lang=en (accessed 04/02/2013)

[42]Statistics for Wales (First release June 28 2012 - SDR 104/2012)): Local Authority Municipal Waste Management Jan- March 2012. Statswales Cardiff

3.2.3 The status of some indicators may differ between the two publications (for example, ecological footprint). This is because the Sustainable Development Indicators look at more recent trends and present progress against an agreed set of indicators from a baseline year of 2003 (or the nearest year for which data are available), whereas the State of the Environment report considers progress over a longer term (in some cases, where data permits, from the 1990s).

3.2.4 As well as these key sources, the literature review included a number of other documents and websites such as the UK National Ecosystem Assessments, Health Statistics, RDP 2007-13 State of Environmental Report, Wales Environment Strategy and Action Plan, and the Wales Sustainable Development Scheme.

3.2.5 Whilst there are no significant contradictions between statistics, some anomalies were identified as a result of different baseline scopes, starting dates, criteria and indicators and perhaps different approaches to aggregating data. Where relevant, these have been indicated.

3.2.6 Whilst a range of data on some topics such as ecological and chemical condition of water, could be taken from single sources such as Natural Resources Wales, data on other topics such as erosion, carbon sequestration and organic condition of soils is relatively dispersed[46], although the Countryside Survey 2007 and Cranfield University provided much of the underlying data.

3.2.7 Some of the data is based either at a local level (i.e. development plan and below) or in a UK (or even English) context, rather than in a Wales one. For example, Amar et al[47] and Forestry Commission England[48]

[43] Welsh Assembly Government (2010): Wales' Population. A demographic overview. Stats Wales Cardiff

[44] Welsh Assembly Government (2008): A Statistical Focus on Rural Wales. 2008 edition. Stats Wales Cardiff

[45] Welsh Government (2010): Welsh Agricultural Statistics 2010. Stats Wales Cardiff

[46] For example, a range of papers relate to aspects of soil compaction including Critchley et al 2011; Newell Price et al 2012; and Bhogal et al 2011. Other papers relate to erosion (Exeter University 2003-2005 Defra study); ecosystem management and soil regulation (Smith P et al 2012); and the various studies carried out under the Countryside Survey 2007 including loss of soil carbon; acidification; and soil biodiversity (Carey et al. CEH 2008)

[47] A Amar, C M Hewson, R M Thewlis, K W Smith1, R J Fuller, J A Lindsell, G Conway, S Butler and M A MacDonald (2006): 'What's Happening to Our Woodland Birds?' RSPB Sandy Bedfordshire and BTO Thetford Norfolk

3.3 Overview

3.3.1 Wales covers an area of about 20,780km²[49] with a coastline of about 1,296km[50].

3.3.2 It has a population of 3.06 million with an average population density of 143 persons per square kilometre[51]. The rural area (i.e. the nine predominantly rural local authority areas) covers an area of 17,060km^2 (82.1per cent) with a population of around 1 million people[52]. Agricultural land occupies around eighty per cent of the land of Wales.

3.3.3 Whilst a significant population lives in concentrated settlements such as the capital Cardiff (population 341,000), Newport, Flint and Wrexham, the land of Wales is predominantly rural[53] with agriculture being the dominant land use[54,55], and settlements are highly dispersed in some areas, where they *'...act as vital service hubs to the Uplands of Wales, keeping the heart of the Uplands pumping. The vitality of these hubs is essential to counteract the fragility of the most isolated areas.'*[56]

3.3.4 Topographically, Wales is predominantly upland, with much of the land being over 150 metres (see Appendix 1 map 2) In the north, Snowdon is the highest mountain in England and Wales, at 1085 metres, and in the south, the Brecon Beacons rise to 885 metres. Between them, the

[48] Ray D, et al (2010). Climate Change: Impacts and Adaptation in England's Woodlands.

[49] CCW's SSSI in Wales Report 'Current State of Knowledge' 2005-2006 gives the area as 2,122,453Ha (21, 225km^2)

[50] The length of the coast varies according to different measurement criteria. The source used here is CCW, 2006, 'Advice to the Welsh Assembly Government - Extending Access to the Coast' which gives the length as 1296km. EUCC: http://www.coastalguide.org/wales/ gives the total length as 1562km. The British Cartographic Society gives the length as 2740km: http://www.cartography.org.uk/default.asp?contentID=749.

[51] National Census 2011

[52] WAG (2008) Statistics for Wales: A Statistical Focus on Rural Wales, 2008 Edition

[53] For a discussion on definitions of 'rural' see Pateman, T. (2011). Rural and Urban areas: comparing lives using rural/urban classifications. Office for National Statistics. See also section 2.1.1 of this report .

[54] UK 2005. The Official Yearbook of the United Kingdom of Great Britain and Northern Ireland.. London: The Stationery Office. 2004. pp. 279. ISBN 0-11-621738-3.

[55] It should be noted however that at 22,900 full-time and 28,000 part-time workers, agriculture is not the dominant occupation in rural Wales (Farming Facts and Figures 2012).

[56] Welsh Uplands Forum (December 2012): Unlocking the Potential of the Uplands'.

Cambrian Mountains[57] forms an extensive upland tract rising to Pumlumon at 752 metres. Other notable upland areas include the Berwyn and Radnorshire hills.

3.3.5 Significant topographic variation occurs over short distances and directly influences the differences not only in climate but in physical conditions such as hydrology and soils. The type of land use and land cover reflects historic human responses to topographic and climatic constraints, resulting in patterns of extensive tracts of open grazed uplands and wooded valleys, with fields defined by walls, hedgerows or post and rail fencing according traditionally available materials. Coastal flats and broad valley bottoms provide opportunities for more productive agriculture.

3.3.6 The rivers drain radially from the upland areas, the Severn being the longest river in England and Wales. Other important rivers include the rivers Dee, Wye, Taff, Tawe, Usk, Teifi, Tywi, Dyfi, Mawddach, Dwyryd and Conwy. There are a number of hydro-electric schemes and reservoirs that supply major settlements in both Wales and England.

3.3.7 Wales has an essentially maritime climate, characterised by weather that is often cloudy, wet and windy but mild. However, the shape of the coastline and the central spine of high ground from Snowdonia southwards to the Brecon Beacons introduce localised differences. Whilst some upland areas can experience harsh weather, the coasts enjoy conditions that are more favourable and areas in east Wales are more sheltered and hence similar to neighbouring English counties.

3.3.8 These topographical and climatic conditions place severe constraints on the ability of agriculture to diversify. In 1984, eighty per cent of agricultural land was designated 'Less Favoured Area' (LFA) to reflect these challenges, approximately 1,370,400Ha[58]. Of this LFA, about seventy two per cent is classified as 'Severely Disadvantaged'[59] (986,688Ha) (see Map 3).

3.3.9 Wales contains 305,000 hectares of woodland, of which 152,000 hectares (49.5 per cent) is coniferous. Compared to the rest of Europe Wales has a

[57] Technically this mid-Wales area has been the 'Cambrian Mountains' only since the 1950's
[58] Calculated on the basis of 80% of 1,713,000Ha Farming Facts and Figures Wales 2012

[59] Farmers' Union of Wales's submission to the Rural Development Sub-Committee inquiry into the future of the uplands in Wales (undated). http://www.assemblywales.org/bus-home/bus-committees/bus-committees-third1/bus-committees-third-rd-home/inquiries-3/rdc_3_-the_future_of_the_uplands_in_wales_-_home_page/rdc_3_-fuw8.htm

low level of woodland. About 117,000 hectares of woodland (38.4 per cent) is owned by the Welsh Government, the remainder privately owned.

3.3.9 Some thirty per cent of the land area has protection in special sites for wildlife, scenic beauty or geological value, and it is worth noting that approximately 80 per cent of non-tidal land categorised as SSSI is in the LFA, as are the majority of lakes and rivers with equivalent status. The latter comprise some 1,588 km of main rivers and 264 lakes[60]. According to the Welsh Uplands Forum, 171,127ha of the SDA is designated as Sites of Special Scientific Interest (SSSI)[61]. This is approximately 66.5 per cent of the total SSSI area[62]

3.3.10 Light pollution within the central landmass of Wales is low because of the lack of large settlements. In contrast, it is high around the settled coastal areas especially in the south and the north east.

3.3.11 Pollution from carbon, nitrous oxide and particulate emissions varies considerably between areas of relatively limited road traffic and the industrialised commuter conurbations. On the other hand, ground level ozone is associated with rural areas.

3.4 Population and human health

3.4.1 Migration has a significant impact on the demographics of rural Wales. There is a net outflow of young adults (16 to 25) with net inflows for all other age groups. The largest inflows are for older working age persons (45 to 64) and children (under 16). Overall the population of rural Wales is growing. The number of young persons (under 25) is falling, but less fast in rural Wales than in other parts of Wales. The number of elderly persons (over 64) is growing more rapidly in rural Wales than in other parts of Wales, which is likely to place increased stresses on the delivery of services, especially healthcare[63].

3.4.2 Remoteness is a critical factor when considering social exclusion issues, especially in relation to the provision of key services such as

[60] ibid.

[61] Welsh Uplands Forum (December 2012): Unlocking the Potential of the Uplands' page 16.

[62] CCW's SSSI Review 2006 gives the total SSSI area as 257,251Ha.

[63] Welsh Assembly Government ' A Statistical Focus on Rural Wales'. 2008

healthcare, support services (e.g. child care, support for the elderly, etc.), education and training, recreational activities and cultural opportunities.

3.4.3 The trend towards the centralisation of public services in order to deliver financial efficiency will need to consider where new development can best be located. Services must be accessible to as many people as possible, and if a low carbon future is to be envisaged, would need to be accessible by public transport. Providing accessible rural services inevitably carries a higher cost, but service provision is also a key employer and income provider in rural communities.

3.4.4 Of equal concern is the fact that those in low income households in remote rural communities are more likely to experience problems with access to basic services such as food shops. Map 4 indicates those areas that are deprived by virtue of limited access to key services, which includes much of rural Wales[64].

3.4.5 Changes in climate leading to more adverse weather conditions may make it impossible to access centralised education/health services for those living anywhere other than in their immediate vicinity, and may also make it difficult for employees to travel to work if there are long journeys involved.

3.4.6 On the other hand, rural Wales enjoys a higher quality environment, where this is defined in terms of air quality and lower risks from flooding (Map 5).

3.4.7 The Welsh Government's Sustainable Development Scheme 'One Wales: One Planet (May 2009) defines wellbeing (p19) as:

'...a positive physical, social and mental state; it is not just the absence of pain, discomfort and incapacity. It requires that basic needs are met, that individuals have a sense of purpose, that they feel able to achieve important personal goals and participate in society. It is enhanced by conditions that include supportive personal relationships, strong and inclusive communities, good health, financial and personal security, rewarding employment and a healthy and attractive environment.'

3.4.8 The State of the Environment Report (July 2012) sets outcomes for health and wellbeing and provides detailed information on progress, based on sets of indicators. Its main findings on the condition of health and well being in Wales are summarised here:

[64] Index of Multiple Deprivation 2005

- In 2009/10, 50.3 per cent of respondents found it very easy to access parks or open space and a further 35.6 per cent found access fairly easy, a decrease from 89.9 per cent in 2005 to 85.9 per cent in 2009/10.

- Twenty per cent of adults reported currently being treated for high blood pressure, fourteen per cent for a respiratory illness, twelve per cent for arthritis, eleven per cent for a mental illness, nine per cent for a heart condition, and seven per cent for diabetes.

- Twenty nine per cent of adults reported being physically active on 5 or more days in the past week.

- Fifty seven per cent of adults were classified as overweight or obese, including twenty two per cent obese. Thirty five per cent of children were classified as overweight or obese, including nineteen per cent obese.

- In 1997, 78.2 per cent of people travelled to work by car. In 2011, this had risen to 80.7 per cent (+2.5 per cent). In 1997, 11.2 per cent of people walked to work. In 2011 this had fallen to 10.3 per cent (-0.9 per cent).

- Over the same period people using public transport had fallen from 8.8 per cent to 7.5 per cent (-1.3 per cent), and those travelling by bicycle had fallen from 1.9 per cent to 1.4 per cent (-0.5 per cent).

3.4.9 It should be noted that the farming, forestry and fishing sectors are particularly risky. Whilst just one per cent of the UK population work in agriculture, it accounts for about 20 per cent of all work related fatalities.[65] It is likely that farmers tend not to report illnesses and injuries as frequently as other workers, and the statistics for self-reported injuries and illnesses may not be meaningful. As the farming population ages, there is perhaps increasing concern that this may be reflected in increases in accidents.

3.4.10 Research by LANTRA indicates that these sectors are dominated by micro businesses (ninety seven per cent of which have fewer than ten employees), mainly (fifty seven per cent) self employed. The workforce is

[65] Health and Safety Executive: Agriculture: Work related injuries and ill health http://www.hse.gov.uk/statistics/industry/agriculture/index.htm

aging, with sixty one percent over 45 years old, and dominated by males (over three quarters of the workforce)[66]

3.4.10 In terms of housing stock, although the number of homes has steadily increased since 1986, the rate of unfitness has continued to fall (Welsh House Condition Surveys and Living in Wales Survey 2004). By 2008 the number had reduced from 19.5 per cent of the 1986 total (199,000 dwellings) to 4.1per cent (52,100).

3.4.11 The 2004 Living in Wales property survey estimated that only 0.8 per cent of all social housing met the Welsh Housing Quality Standard. By 2008 this figure was about six per cent. Although the trend continues to be downwards, as building standards are raised, the 'fitness' bar is likely to be raised, especially as 'unfitness' relates to eleven standards including disrepair, dampness and ventilation. A failure to meet any one of the eleven standards will classify the dwelling as unfit for habitation.

3.4.12 Volunteering is seen as an indicator of social cohesion and as a reflection of people's confidence and willingness to participate and to donate time, and may be a valuable indicator of general well-being. The number of environmental volunteers across a sample of 14 Wales Environment Link member organisations was 36,615 in 2009/10 an apparent increase over previous years. However, 2011/12 has seen a significant reduction to 24,315 volunteers.

3.4.13 A variety of health data sources (see Welsh Government 'Key Health Statistics for Wales' 2012; Wales Health Survey 2011) report issues surrounding lifestyle habits including smoking, alcohol use and obesity. While there are potentially many diverse health issues affecting rural Wales in particular, those that are relevant to the RDP and the SEA especially are more limited. In the context of the SEA they are likely to be linked to access to the countryside and recreation, reducing health inequalities and access to quality and nutritious food.

[66] LANTRA. Agriculture, Forestry and Fishing. Sector Skills Assessment 2012. October 2012

3.5 Biodiversity[67]

3.5.1 Of the 21,000 km^2 land and freshwater surface area of Wales, about thirty per cent is protected in special sites for wildlife, scenic beauty or geological value.

3.5.2 The three National Parks and five Areas of Outstanding Natural Beauty are categorised by the International Union for the Conservation of Nature as Protected Landscapes (Category V). These areas occupy twenty four per cent of Wales' terrestrial space (5,078 km^2), and are protected in part through an enhanced consideration of environmental matters in the management of development. Within them are many of Wales terrestrial biodiversity sites. Two of the National Parks - Snowdonia/Eryri and the Brecon Beacons - are largely within the Severely Disadvantaged Area agricultural designation.

Protected Areas in Wales

3 National Parks
5 Areas of Outstanding Natural Beauty (AONBs)
14 Heritage Coasts
1 Biosphere Reserve
2 Geoparks
92 Special Areas of Conservation (SACs)
20 Special Protection Areas (SPAs)
Over 1,000 Sites of Special Scientific Interest (SSSI) (about 12per cent of the country's' surface)
72 National Nature Reserves (NNR) (over 25,000 ha of land)
1 Marine Nature Reserve (over 1,000 ha of sea)*
92per cent of NNRs by area are also sites of international importance for wildlife
40per cent of designated habitats and species are considered to be in favourable condition, and over30per cent are in a process of recovery
11 Royal Society for the Protection of Birds (RSPB) reserves
236 Wildlife Trust reserves
* The Welsh Government is in the process of reviewing the number and size of Welsh Marine Reserves

[67]Data derived from JNCC http://jncc.defra.gov.uk/page-1399; and from CCW http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape.aspx; unless stated.

3.5.3 Wales has one internationally recognised Biosphere Reserve, Dyfi Biosphere, based on the principle of strictly conserving the biodiversity values of a core area, establishing a buffer area where activities are linked to the ecosystem services provided by the core and which support its protection, and a transitional area based managed on sustainability principles. Such places are inscribed by the United Nations Educational Scientific and Cultural Organisation (UNESCO) as 'bio-laboratories', dedicated to finding novel human-nature interactions. Wales has one European geologically important Geopark, part of the Brecon Beacons National Park.

3.5.4 Local Authorities designate Local Nature Reserves (LNR) that have locally important features. They combine conservation with opportunities for quiet enjoyment of nature and for educational purposes. There are 53 in Wales.

3.5.5 136,702 Ha is designated under the European Birds Directive as Special Protection Area (SPA) on 20 sites, and 628,726Ha is currently designated under the Habitats Directive as Special Area of Conservation (SAC) on 92 sites. Much of the SAC is marine and estuarine. The Severn and Dee estuaries were fully declared as in 2009, and a significant proportion of the north, west and south-west coasts are also designated. Important terrestrial SACs include the Berwyn Mountains, parts of the Snowdonia and Cambrian Mountains, and the catchments of the Wye and Dee rivers (see Map 6).

3.5.6 There are over 1,019 Sites of Special Scientific Interest (SSSIs) in Wales covering an area of over 235,000Ha (see Map 7). Seventy three of these are designated National Nature Reserves (NNR). The distribution of these protected sites is variable. For example, Gwynedd and Anglesey account for 25 NNRs, covering 4,891Ha, over one-third of NNRs by number and just under one-fifth in area. Gwynedd and Anglesey also account for one third of Wales' SPAs[68].

3.5.7 About 8.4 per cent of Wales is covered by registered common land amounting to around 175,000Ha. Many small commons are adjoining, making large areas of common land. These small commons may have different owners and different rights holders, and provide grazing for sheep and cattle. In addition, many commons are enjoyed for their leisure

[68] Anglesey and Gwynedd Joint Local Development Plan Sustainability Appraisal (SA) incorporating Strategic Environmental Assessment (SEA). Scoping Report July 2011

and environmental interests[69]. Common land presents a particular challenge in addressing biodiversity loss. According to the UK NEA, common land includes some of the most biologically degraded areas in Wales[70], despite the fact that significant areas are within National Parks and AONBs.

3.5.8 In common with other countries in Europe, Wales missed its international biodiversity targets in 2010. In 2005, fifty nine per cent of Biodiversity Action Plan habitats in Wales were in declining condition. Priority habitats classed as stable or improving increased from thirty per cent in 2002 to thirty six per cent in 2008. Fifty-four per cent of Biodiversity Action Plan species were assessed as being in 'unfavourable condition' in 2008, but with considerable variation between species groups. For example, eighty per cent of marine mammals and birds were in favourable or recovering condition, while eighty per cent of amphibians, butterflies and fish were recorded as being in unfavourable condition.

3.5.9 Although it was able to assess only a limited number of species, the State of Nature Report for Wales (2013)[71] highlighted the following issues:

- About fifty per cent of butterfly species assessed are in decline
- Fifty seven per cent of plants are in decline, forty three per cent increasing, reflecting responses to the enrichment and increased alkalinity of some soils
- More than one in six plant species are considered threatened
- Farmland species are in rapid decline, whilst wintering waterbirds are increasing
- Wales holds forty per cent of the UK's upland oak woodland

3.5.10 BAP-related interventions appear to be concentrated in north, south and west Wales. The BARS reporting system[72] has mapped nearly 3,400 actions, and has described nearly 1,700 unmappable actions. These include interventions by trusts to restore heathland habitats for black grouse (RSPB Berwyn), to restore field margins as corridors

[69]Welsh Government. Common Land
http://wales.gov.uk/topics/environmentcountryside/farmingandcountryside/common/?lang=en

[70] UK National Ecosystem Assessment (2011). Chapter 20 Wales. p1019

[71] State of Nature Report (2013) a collaborative report between 25 conservation and research organisations
http://www.wtwales.org/sites/default/files/state_of_nature_-_wales_0.pdf
http://www.rspb.org.uk/ourwork/science/research/projects/363867-the-state-of-nature-report

[72] http://ukbars.defra.gov.uk/planning/actionmap

(Denbighshire Wildlife Trust), or by local authorities and the Environment Agency to remove invasive plant species (upper Severn).

3.5.11 In the case of SAC's, sixty one per cent of habitat features and sixty seven per cent of species features for which they were designated are in unfavourable condition. Distribution in terms of condition status is not known, but it is possible that particular features are more challenging in terms of achieving favourable status, depending for example, on surrounding land uses, interactions with other activities and species, and the general biodiversity condition of surrounding areas.

3.5.12 Coastal and marine habitats are under particular pressure, with the majority in stable or declining condition. Specifically, saltmarsh and coastal lagoons are equivocal or stable, whilst cliffs, dunes and shingle show a weak decline in condition[73]. Climate is a factor in influencing the stability of marine habitats[74]. There has been a downward trend in some polluting substances in the marine environment[75] .

[73]UK NEA 2011 Chapter 20

[74] http://qsr2010.ospar.org/en/index.html. See also UK NEA Chapter 12 Marine

[75]State of the Environment Report 2012

Biodiversity Action Reporting System (BARS 2011)
Condition of habitats since 1945

Decline across sixty per cent of marine habitats
Decline across eight per cent of terrestrial habitats*
Decline across thirty three per cent of freshwater habitats
Improvement or stability in eighty per cent of terrestrial habitats*
Improvements or stability in sixty six per cent of freshwater habitats
Improvement in eighty three per cent of Woodland, upland & Enclosed Farmland habitats
Same or accelerated decline in twenty five per cent of wetlands and coastal habitats
Apparent slowing decline in lowland grassland and heathland

UK NEA 2011
'Status & Changes in the UK's Ecosystems and their Services to Society':
Chapter 20 Wales
Key Findings

** About 12per cent are fluctuating/reveal no clear trend*

3.5.13 Other indicators present a mixed picture, particularly in the case of birds, with some farmland[76] and woodland birds showing marked declines (some species showing a 42.7 per cent decrease in range) and others (16.9 per cent) an increase in populations[77].

3.5.14 The National Assembly Sustainability Committee's 2010 report into biodiversity loss[78] lists 19 recommendations for addressing the challenge, including:

- Driving the ecosystem approach into policy and across all government departments in Wales
- Focusing more on biodiversity in the wider landscape rather than dependence on protected sites alone
- Involving the private sector in biodiversity management through the use of incentives and payments for ecosystem services

[76] RSPB has pointed out that a distinction should be drawn between birds associated with upland farms and those associated with lowland farms, and that appropriate monitoring should be based on these separate indicators

[77] Ibid.

[78] Sustainability Committee National Assembly for Wales 'Inquiry into Biodiversity in Wales' 2011

3.5.15 Invasive species, such as the signal crayfish (*Pacifastacus leniusculus*), 'killer shrimp' (*Dikerogammarus villosus*)[79], Himalayan balsam (*Impatiens glandulifera*), Japanese knotweed (*Fallopia japonica*), parrot's feather (*Myriophyllum aquaticum*), floating pennywort (*Hydrocotyle ranunculoides*), and Water fern (*Azolla filiculoides*) are giving rise to concern since they threaten a number of native species, choke waterways and banks, and in some cases damage infrastructure. In coastal waters, Japanese wireweed (*Sargassum muticum*), New Zealand barnacle (*Elminius/ Austrominius modestus*) and algae such as *Heterosiphonia japonica* are also becoming problematic.

3.5.16 A new set of biodiversity targets for 2015 and 2020 was set by the 10th Conference of Parties to the Convention on Biological Diversity (CBD) at its meeting in Nagoya Japan in 2010. The targets are based on protecting and enhancing ecosystem functioning. In response, the EU has produced a biodiversity strategy[80] that promotes six targets, aimed at:

- enforcing EU laws protecting birds and habitats
- maintaining and improving ecosystems - restoring at least fifteen per cent of areas that have been damaged
- getting farming and forestry to help improve biodiversity
- ensuring sustainable use of fisheries resources by reducing catches to scientifically determined limits by 2015 - eighty eight per cent of the EU's fish stocks are currently over-exploited or are significantly depleted
- combating alien species that invade habitats - and currently threaten twenty two per cent of the EU's indigenous species
- stepping up the EU's contribution to preventing global biodiversity loss

3.5.17 The UK Biodiversity Action Plan process was replaced on 1 April 2012 with a commitment by the four administrations in the UK to work towards the prevention of biodiversity loss and meet our international obligations through the establishment of a UK Biodiversity Framework that outlines the UK level objectives of biodiversity policy[81].

[79] http://www.environment-agency.gov.uk/homeandleisure/wildlife/31350.aspx

[80] Our life insurance, our natural capital: an EU biodiversity strategy to 2020. European Commission 2011

[81] JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. UK Post-2010 Biodiversity Framework. July 2012 http://jncc.defra.gov.uk/page-6189.

3.5.18 Unsurprisingly, the strong spatial link between protected areas (both UK and international) and the Less Favoured Areas provides a powerful incentive to link agricultural productivity with environmental measures. Some 31,000Ha of designated SAC is under management agreements[82], as is 18,500Ha of SPA and 1,150 of Ramsar.

3.6 Landscape

3.6.1 The landscapes of Wales are remarkably varied for such a small nation. The underlying geology, and the variety of land use and land cover result in a number of distinctive landscapes that can be identified at both an extensive and at a local level.

3.6.2 Some areas, such as Snowdonia/Eryri, the Clwydian Hills, the Gower Peninsula, the Brecon Beacons and the Wye Valley, are well-known for certain characteristics, and have been named, written about, appreciated and visited for centuries, and it is perhaps no surprise that each of these areas is a protected landscape. Others, such as the Dovey and Tanat Valleys or the Radnorshire Hills are less widely known but are nonetheless well-known and appreciated locally.

3.6.3 These distinctive landscapes can be identified and described in some detail, reflecting their glacial history, their topography, the underlying geology and hydrology and their historic land uses and cultural associations.

3.6.4 These areas have been broadly mapped, and are known as 'landscape character areas'[83]. Forty-eight such areas have been identified in the case of Wales[84] (Map 8). The purpose of mapping these areas is to enable a description of each area's distinctive character, rather than to attempt to identify one landscape as being 'superior' to another.

[82] Section 15 of the Countryside Act (1968) , or Section 16 of the National Parks and Access to the Countryside Act (1949), provide for agreements to be set up between CCW and landowners, whereby the owner may be offered payment towards conservation work, such as changing grazing practice, raising water levels or removing scrub where appropriate.

[83] See Landscape Character Assessment Guidelines, Natural England and Scottish Natural Heritage (2002) http://publications.naturalengland.org.uk/publication/2671754?category=31019

[84] See www.ccw.gov.uk/idoc.ashx?docid=dc3096a3-4149...1

3.6.5 The (then) Countryside Council's LANDMAP programme[85] has developed a system for assessing the condition and quality of Wales' landscape from five dimensions, known as 'aspect areas'. These are cultural, geological, historic, landscape habitat and visual and sensory.

3.6.6 What the LANDMAP programme reveals is the extent of outstanding landscape attributes beyond the protected landscapes of Wales (Maps 9-13). The red areas on these maps indicate outstanding landscape attributes, and the amber areas are of high quality.

3.6.7 Whilst such an assessment has a degree of subjectivity, it has been rigorously tested among landscape professionals and the public and has a high degree of consensus and quality control.

3.6.8 Section 3.5.2 referred to three National Parks and five AONBs. When they were first established the purposes of these areas were to preserve and enhance their 'natural beauty', and in the case of National Parks, to promote their enjoyment by the public[86].

3.6.9 These designations might be seen as essentially landscape designations, not least because 'due regard' was to be had to the needs of agriculture and forestry. 'Natural beauty' was not defined, but the provisions for national parks and AONBs were set out separately to those for nature reserves, and the intention was perhaps to sustain traditional rural practices in order to protect the outstanding character of these areas.

3.6.10 Snowdonia National Park covers the mountains of the Snowdonia range, including the Carneddau and Glyderau mountain ranges. The park contains a wide diversity of landscapes encompassing 37km of coastline with coastal cliffs, beaches, sand dunes and estuaries to ancient semi-natural oak woodland to the open mountaintops. Glacial valleys, lakes and enclosed farming on the lower foothills and coastal plain also reflect the diverse character of this Park.

3.6.11 Brecon Beacons National Park begins close to Llandeilo in the West and runs as far as Abergavenny in the East. The most Northerly point falls in the Wye Valley. The landscape has upland moorland ranging in type from acid heaths through to species rich limestone grasslands that support a wide range of plants and insects and fourteen per cent of the area is covered in woodland. Of particular importance are the rivers and lakes,

[85] See http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/landmap.aspx

[86] National Parks and Access to the Countryside Act 1949. Part II s5 Part VI s87/88

which are home to many important fish and animals, in particular the otter. In 2005, the Upper Swansea Valley within the Park was declared Wales' first Geopark, one of just forty eight sites in Europe.

3.6.12 Pembrokeshire Coast National Park is predominantly a lowland landscape covering the coastal area of Pembrokeshire and all the offshore islands. The waters around the islands form one of three UK Marine Nature Reserves with populations of grey seals and dolphins. The Pembrokeshire Coast Path National Trail covers 299km (186 miles) of some of the most spectacular coastal scenery in Britain, the majority of which falls within the National Park.

3.6.13 The five areas Areas of Outstanding Natural Beauty are the Clwydian Range, Llŷn, Wye Valley, Ynys Môn and Gower.

3.6.14 Landscape character is likely to be an important factor in influencing the environmental effects of schemes under the RDP. Topographical and geographical variations within Wales all provide varying contexts for landscape and the historic and cultural environmental effects of the RDP, for example:

- mountainous areas, coastal, agricultural landscapes, both open and closed, each with its own specific issues and designations;
- certain areas may be defined as "urban", but with many "rural" characteristics;
- cross-border and peri-urban issues, with many farms in the East of Wales having holdings that reach across the border (to England) and to the fringes of urban areas.

3.6.15 The role of 'landscape' as a discrete Glastir targeted element is not clearly established. There are six Glastir targeted elements for enhanced payment for works that support its objectives. However, as Map 14 indicates, this appears to be based on the protected landscapes referred to above, which by implication excludes areas that are not designated but which may have outstanding landscape qualities as defined by LANDMAP. Such areas might include the Berwyn and Cambrian Mountains and the Radnorshire Hills.

3.6.16 Neither the Welsh Assembly Government's document 'Glastir: New Sustainable Land Management Scheme for Wales' (February 2010) nor theNational Assembly's 'Introduction to Glastir and other UK Agri-environment Schemes (February 2011) refers to landscape as a discrete

targeted element, although the Farmers' Union of Wales identifies landscape and access as an element[87].

3.6.17 In any case, a key aspect of landscape relates to features that may be of outstanding significance historically and culturally, and the conservation of these features is an important objective of the Glastir scheme[88].

3.7 Cultural, architectural and archaeological issues

3.7.1 The Welsh language is a member of the Brythonic branch of Celtic languages, and is the oldest spoken language in Europe. In 2001, the number of Welsh speakers was over 582,000 (twenty one per cent of the total population) [89]. The 2011Census results on the Welsh language in Wales were published by the Office for National Statistics on 11 December 2012. These initial results include data at a Wales and local authority level. The number of people who speak Welsh has fallen in the past 10 years, according to the 2011 census. Despite an increase in population the number of Welsh speakers has fallen overall from 582,000 in 2001 to 562,000 in 2011, a two percentage point drop in Welsh speakers - from twenty one per cent to nineteen per cent.

3.7.2 Gwynedd and Anglesey are the only areas where over half the population now speak Welsh. Gwynedd now has sixty five per cent (down from sixty nine per cent) while fifty seven per cent of the population (down from sixty per cent) speak Welsh on Anglesey. Welsh is now a minority language in two of its traditional strongholds: Ceredigion at forty three per cent (down from fifty two per cent) and in Carmarthenshire at forty four per cent (down from fifty per cent). The local authorities with the lowest percentage of Welsh speakers are in South East Wales. Blaenau Gwent reported the lowest percentage of people who could speak Welsh at 7.8 per cent. Overall, nineteen per cent of the Welsh population aged over three said they were able to speak the language[90].

3.7.3 It has been thought that migration trends and education might lead to an increase in speakers in less traditional Welsh-speaking areas. But the census suggests otherwise, with just two areas, Monmouthshire and Cardiff, seeing a percentage increase.

[87] http://www.fuw.org.uk/glastir-faq-advanced-element.html

[88] Welsh Assembly Government (2010). 'Glastir: New Sustainable Land Management Scheme for Wales' WAG Cardiff (February 2010)

[89] WAG 2010: Wale's Population – a Demographic Overview. Cardiff 2010

[90] Census 2011/ONS

3.7.4 There has been a significant decline in the number of Welsh speakers in the rural areas. Natural Resources Wales has been consulting on its Draft Welsh language scheme[91]. Part of this new body's vision is to

"Promote an understanding that the Welsh language, as a part of Welsh culture, is integral to the ecosystem approach to managing the environment in Wales"

3.7.5 Wales contains a rich heritage of historic buildings, including vernacular and agricultural buildings, as well as industrial, ecclesiastical and historic military structures and sites. The historic works at Blaenavon are a UNESCO Cultural World Heritage Site, as are the Edwardian castles at Harlech, Beaumaris, Caernarfon, and Conwy. Wales has reputedly the highest concentration of medieval castles in the World[92].

3.7.6 It is important that Wales' historic building stock and its character is maintained to a high standard, and this includes wherever possible its setting. Retro-fitting historic buildings to an adequate environmental standard is likely to prove highly costly, not least the need to ensure that hardware and insulation does not conflict with the integrity if such buildings.

3.7.7 In 2007, Cadw commissioned a baseline report on listed Buildings at Risk in Wales. This brought together data from most of the local authority registers. The 2009 summary report[93] estimated that of the 29,896 listed buildings in Wales, 2,882 are 'at risk', and 5,145 are 'vulnerable', owing to the rate of decline of their fabric and character. The report indicates that North West and Central Wales have a particularly high number of 'at risk' buildings.

3.7.8 There are four Landscape Partnership schemes in Wales: Llŷn, Tywi Valley the Clwydian Hills and Blaenavon. These schemes aim to support the conservation and enhancement of these special landscapes. In the 1990's, Cadw commissioned a rapid archaeological survey of the entire Welsh coast, resulting in the identification of over 3,000 sites and

[91]http://www.ccw.gov.uk/about-ccw/consultations/draft-welsh-language-scheme.aspx

[92] Wales Tourist Board http://www.studyinbritain.com/info/walestourist.asp [accessed 03/03/2013].

[93]Buildings at Risk in Wales". Handley Page partnership for Cadw. (2009).

monuments of archaeological and historic interest. Of these over 2,000 were recorded for the first time.[94]

3.7.9 Of particular relevance to the RDP, traditional farm buildings, and the structures associated with them, represent the distinctive character of local architecture. They reflect the historic availability of local materials, and reflect local vernacular building styles that tell the story of Wales' farming and domestic history. The protection of such structures, and the revival of traditional skills associated with their construction and maintenance, is an important heritage objective. Apprenticeships in traditional building skills, such as the opportunities offered at the Traditional Building Skills Centre, Dinefwr[95], are central to this endeavour.

3.7.10 Fifty-eight areas of Wales have been identified for placing on the historic landscapes register maintained by Cadw, NRW, and the International Council of Monuments and Sites (ICOMOS). There are also over 100,000 archaeological sites listed by the four Welsh Archaeological Trusts, some of which are impressively set[96] [97].

3.7.11 The role of museums, archives and libraries is significant in preserving and promoting the culture of Wales. With over four hundred service points spread across Wales they provide an important network delivering mostly free public access to resources reflecting all aspects of Welsh culture[98]. However, the Wales Rural Observatory Report into rural services (2010) stated that seventy eight per cent of the responding rural communities did not have a permanent library, and thirty six per cent had no mobile library service[99]. Bearing in mind the issues raised in paragraphs 3.4.2 and 3.4.4, easy access to these facilities by small rural communities is likely to be limited.

[94] CADW Caring for Coastal Heritage p3

[95] TheTraditional Building Skills Centre (Tywi Afon yr Oesoedd) is based at Dynefwr Home Farm and managed by Carmarthenshire Council and CCW with the support of the National Trust.

[96] See www.archwilio.org.uk

[97] www.ccgc. gov.uk/landscape/wildlife/protecting-our-landscape/ historic-landscapes/wales-historic-landscapes.aspx

[98] Socio-economic analysis of Wales. WEFO February 2013.

[99] Wales Rural Observatory (2010) Report of Survey into Rural Services. Aberystwyth University. Cardiff University. Welsh Government. p23

3.7.12 The Welsh Government is currently undertaking a review of the historic environment of Wales to help shape the context of a Heritage Protection Bill for Wales which is due to be introduced in 2014-15.

Cultural, Architectural & Archaeological Heritage Facts

- In both 1996 and 2003, **nearly 80per cent of scheduled ancient monuments were reported to be stable, and about 10per cent are improved or greatly improved**
- There was **an increase in superficial disturbance**, generally from invasive vegetation and scrub encroachment, probably due to the less intensive agri-environmental schemes. This was offset by the reduction in the disturbance sometimes caused by intensive agriculture.

Cadw: Position Statement 2007

Listed buildings at risk, 2007 and 2008

- The percentage of the sample of listed buildings in Wales that were classed as **'at risk'** has **fallen slightly from 10.2 per cent in 2007 to 9.6 per cent in 2008**.
- The percentage of the sample of listed buildings that were classed as **'vulnerable'** has **fallen slightly from 17.5 per cent in 2007 to 17.3 per cent in 2008**.
- The percentage of the sample of listed buildings that were classed as **'not at risk'** has **increased slightly, from 72.4 per cent in 2007 to 73.2 per cent in 2008.**

Handley Partnership/Cadw

3.7.13 Cadw is seeking how to facilitate public engagement, access and appreciation for the historic environment, supporting regeneration through conservation, maximising the value of the historic environment to the Welsh economy and encouraging local communities to value and protect their local heritage – rural communities are an important part of this discussion.

3.8 Soils

3.8.1 Soil type and categorisation is well recorded. Avery (1980) classified the soils of England and Wales, describing 10 major groups with 43 groups and about 120 subgroups[100] that reflect variants on the basic definition

[100] Avery BW (1980). Soil classification for England and Wales [Higher Categories]. Survey Technical Monograph No. 14, pp67. Harpenden, UK.

and include texture or parentage as criteria for refining the type. In some cases the name of the subgroup relates to a geographical location suggesting where they were first mapped. Unfortunately some of the Welsh series names have been lost due to rationalisation, though many important soils retain their original Welsh names[101].

3.8.2 There is a wide variety of different soil types within Wales, providing a diverse range of soil fertility levels. Regional differences in agricultural practices are emphasised by the presence of either good quality, fertile soil or poor quality, shallow, infertile or waterlogged soils. Of the ten major groups present in Wales, three occupy about thirty per cent of the land:

- Brown soils are relatively common below 300 m, where slopes are gentler and rainfall is lower than in the Uplands. They form mainly on permeable materials and are typically deep and often well drained. Where gradient and climate is favourable, brown soils can be agriculturally productive.

- Gley Soils are quite extensive and suffer from varying degrees of seasonal water logging. This can limit agricultural potential, especially where the subsoil is slowly permeable and rainfall is high. Gley soils are divided into two types: Surface-water gley soils are most extensive. These are waterlogged due to permeable layers restricting downward drainage of water through the soil. Ground-water gley soils are less extensive, associated with fluctuating water tables, for example river floodplains.

- Podzolic Soils are essentially acid upland soils. They mainly occur above 200 - 300m above sea level, where rainfall is in excess of 1,000 mm per year and sometimes occur on steep slopes. Podzolic soils can be inherently well drained. However, they normally occur in areas of prolonged high rainfall. Peaty/organic rich topsoils can occur in colder high rainfall areas. Most of the land is permanent pasture, leys or rough grazing, partly due to terrain and climate limitations.

3.8.3 Peat soils are predominantly found in mountain areas. High rainfall and cool temperatures limit the decay of vegetation, creating a build up of carbon rich organic material. The high rainfall, cold temperatures and acid nature of these soils severely restricts agricultural use. Upland Welsh

[101] See Conway J (2006). Soils in the Welsh Landscape. http://jscnwy.wordpress.com/soils-of-wales/soil-classification/

peats support semi-natural habitats, often of conservation importance. In addition, peat soils play an important role in climate change regulation.

3.8.4 Whilst soil types are well understood and have been categorised, there are still gaps in understanding its structure and function. The rate at which the soil carbon store is changing in Wales is the subject of some debate, with apparently contradictory results from two major UK surveys; the National Soil Inventory[102] and the Countryside Survey 2007[103]. Issues such as carbon storage, soil compaction[104] and erosion[105] are, and have been, subject to research.

3.8.5 Globally, twice as much carbon is stored in soils as in the atmosphere with peatlands contributing a third of this. Therefore, even small changes in soil carbon stocks might contribute significantly to global climate change, for example, due to a positive feedback as a result of global warming. Whereas above ground carbon cycling is well understood, there are great uncertainties in climate impacts on soil carbon cycling[106].

3.8.6 There is currently a general lack of reliable information on rates of soil loss from agricultural land in the UK. Environment Agency figures estimate the annual costs of soil erosion to the UK economy to be £202 million but actual extent and rates of soil erosion are poorly understood making cost estimates unreliable.[107]

3.8.7 Most studies focus on erosion by water - few studies have monitored soil erosion by wind, tillage or soil loss through co-extraction on root crops or farm machinery at the national scale[108].

[102] Bellamy et al 2005

[103] Emmett et al. 2010

[104] Research Study BD5001: Characterisation of Soil Structural Degradation under Grassland and Development of Measures to Ameliorate its Impact on Biodiversity and Other Soil Functions. Newell Price et al 2012. Literature Review. Critchley and Kirkham 2011.

[105] See Bellamy and Rickson (2011) Monitoring Soil Erosion in England and Wales. Cranfield University.

[106] see for example Baldock et al (2012). Soils and climate change: potential impacts on carbon stocks and greenhouse gas emissions, and future research for Australian agriculture http://www.publish.csiro.au/paper/CP11170.htm, accessed 07/02/2013; Davidson and Janssens (2006). Temperature sensitivity of soil carbon decomposition and feedbacks to climate change. http://www.nature.com/nature/journal/v440/n7081/abs/nature04514.html. accessed 07/02/2013

[107] NRSI 'Monitoring Soil Erosion in England and Wales'. Cranfield University 2011

[108] ibid.

3.8.8 The effect of soil erosion can be significant. As well as loss of productive material, eroded soil can contaminate water courses, resulting in loss of spawning grounds; eutrophication and pollution; siltation; and damage to roads and footpaths.

3.8.9 Newell-Price et al (2012) indicate that severe soil compaction and poor soil condition (for the main body of grassland fields) is a reasonably common issue in the grasslands of England and Wales (around one in ten fields), and that moderate soil conditions are widespread. Notably, it was also clear that poor soil condition was not restricted to 'improved' grasslands; there was a higher percentage of 'semi-improved' grassland soils in poor condition than 'improved' grasslands[109]. The potential for alleviation of compaction through the use of certain plant species[110], and by mechanical soil loosening[111], has also been the subject of research.

3.8.10 The properties, activities of, and interactions between soil biota are critical requirements for the provision of most soil functions through their role in the provision of 'ecological services', in particular food and fibre production, environmental interactions, and support of habitats and biodiversity. A number of soil-dwelling invertebrates and some fungi are covered by biodiversity action plans (BAPs), but since our knowledge of soil biodiversity is sparse it is not known how climate change, land management and above ground vegetation, amongst other factors, affect their diversity[112].

3.8.11 Concern also revolves around the potential impact of climate change. As the Welsh Government has put it,

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[109] WP1 Characterisation of soil compaction under grassland. BD5001: Characterisation of Soil Structural Degradation Under Grassland and Development of Measures to Ameliorate its Impact on Biodiversity and Other Soil Functions

[110] C N R Critchley & F W Kirkham (2011): Use of Plant Species for Remediation of Soil Compaction

[111] A Bhogal, C Bentley, P Newell Price and B Chambers (2011): The alleviation of grassland compaction by mechanical soil loosening

[112] Brussard (1997). Biodiversity and Ecosystem Functioning in Soil. Ambio Vol. 26, No. 8, Dec., 1997. (pp. 563-570); Brussard et al (2007). Soil biodiversity for agricultural sustainability. Agriculture, Ecosystems & Environment. Volume 121, Issue 3, July 2007, Pages 233–244

'Climate change is also expected to lead to changes in soil composition. A reduction in the carbon content of soil will lead to a reduction in the capacity of the soil to absorb rainfall.[113]'

3.8.12 While other measures promoted soil protection, there was no distinctive measure within Europe that aimed specifically to protect the quality and productivity of the soil. The European Commission published a proposal for a framework directive on the protection of the soil in 2006[114], and more recently has published a report on the implementation of the Soil Thematic Strategy[115], which was an output of the Sixth European Environmental Action Programme[116].

3.8.13 The Common Agricultural Policy requires all farmers in receipt of the single payment to take measures to protect their soil from erosion, organic matter decline and structural damage. Preventing soil erosion is an important aspect of maintaining Good Agriculture and Environmental Condition (GAEC) under Cross Compliance[117].

3.8.14 The Welsh Government 'State of the Environment Report' sets outcomes for soil management and provides detailed information on progress based on sets of indicators. The main findings on the condition of soil in Wales in the most recent report (July 2012) are summarised below.

- Estimates of methane and nitrous oxide emissions due to land use and land use change and forestry activities remain small
- The results from the Wales report showed that the mean soil (0-15cm) carbon stock in 2007 was highest under 'dwarf shrub heath' habitat, and lowest in arable soils. Too few samples were available for analysis of the other peat-dominated broad habitats, bog and fen, marsh and swamp

[113] Welsh Government National Strategy for Flood and Coastal Erosion Risk Management in Wales. Nov 2011:14

[114] COM(2006) 232 final. Proposal for a directive establishing a framework for the protection of soil and amending Directive 2004/35/EC

[115] COM(2012) 46 final. Report on implementation of the Soil Thematic Strategy and ongoing activities. 2012

[116] EU 6th Environmental Action Programme. http://ec.europa.eu/environment/newprg/index.htm. accessed 21/02/2013. Now superceded by the 7th EAP (20 November 2013). http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013D1386&from=EN

[117] Rural Payments Agency GAEC 1 - General Requirements for Soil Management and Protection

3.8.15 Globally, soil is under stress from a number of factors, including erosion, loss of organic matter, salination, compaction, contamination, loss of biodiversity, eutrophication and acidification. In Wales, development, agricultural intensification, erosion, pollution and loss of carbon are all potential challenges, with potential impacts on human health, food productivity, biodiversity, ecosystem functions and the economy.

3.8.16 The need to understand the properties and functions of soil is critical in assessing soil-vegetation relationships, SSSI citations, habitat restoration, water quality and climate change impacts, as well as regulating waste management.

3.9 Water - resource and quality

3.9.1 The Welsh Government 'State of the Environment Report' (2012) sets outcomes for water resources and provides detailed information on progress that is based on sets of indicators.

3.9.2 Generally, there has been a downward trend in water leakage, from 249 megalitres per day in 2000-02, to 202 megalitres per day in 2010-11. However, this represents 23.5 per cent of total water supplied[118].

3.9.3 Overall, average per capita consumption in Wales has remained fairly stable: having risen from 148 litres/day in 2001 to 152 litres/day in 2008-09, in 2010-11 it was 149 litres/day. Where households were metered, consumption was significantly less.

3.9.4 Not all of the water abstracted in Wales is for home consumption, as there are considerable transfers to English regions. Significant reservoirs, such as the Elan Valley and Vyrnwy supply the English Midlands. According to the (then) Environment Agency (2010)[119], abstractions in Wales were forty per cent greater in 2007 than in 1995. The major reasons for abstraction related to electricity supply and represented seventy five per cent of total Welsh abstractions. It should be recognised that most of the water abstracted for this purpose is returned to the environment.

3.9.5 In terms of quality, the picture appears mixed. Bathing waters have achieved a high level of compliance with EC standards since 2002. For

[118] Welsh Government State of Environment Report 2012; UK NEA 2011

[119] the figures shown in this section are cited in the Wales State of the Environment Report. See http://wales.gov.uk/topics/statistics/headlines/environment2010/100722/?lang=en

five of the last ten years, compliance has been one hundred per cent. It is not clear to what extent this success has been weather related – when there is heavy rainfall in summer, sewage discharges to sea mean that the EC standards are not met. This raises the question as to what will be the impact of increased climate change-induced extreme weather events might be.

3.9.6 For chemical quality, the percentage of river length of good quality has been consistently high at about ninety five per cent. However, ecological and biological water quality indicates some areas of concern.

3.9.7 Whilst sixty seven per cent of coastal waters have been assessed as being of 'good' or 'high' ecological quality, this implies that thirty three per cent (i.e. one third of the coastal zone) is not of good ecological quality. The picture for overall river length of good biological quality is positive at approximately eighty seven per cent. However, the ecological status for specific water body types is mixed: thirty six per cent of transitional water bodies, thirty four per cent of rivers, fifty six per cent of canals and twenty one per cent of lakes assessed were given 'good' or 'high' ecological status in 2011.

3.9.8 In 2002, Environment Agency Wales identified 1,300 mine sites where discharges to water are known to occur (EAW 2002)[120]. This continues to be a significant source of pollution, accounting in 2012 for 130 or ten per cent of water bodies failing to meet WFD standards[121]. Other major sources of WFD failures in water bodies are:

- agricultural pollution (155 failing water bodies)
- artificial barriers to fish migration (150 failing water bodies)
- impoundments (reservoirs) and regulated flows (101 failing water bodies)
- sewage discharges (82 failing water bodies).

3.9.9 The Welsh Government's green paper 'Sustaining a Living Wales' (2012) highlights some of the challenges to water resources in Wales (p8):

'Even though Wales receives more annual rainfall than many other parts of the UK this does not mean that we can take a continuous and endless supply of water for granted. In Wales rainfall travels quickly to our rivers

[120] See Metal mines strategy (2002). Chapter 2 Drivers and Background. See also Science Report SC0301 136/SR4 (2008) Assessment of metal mining-contaminated river sediments in England and Wales.

[121] Living Waters for Wales, Fifth Water Framework Directive Newsletter, Spring 2012, Environment Agency Wales.

and during dry periods our river levels can also drop quickly in response. In addition to causing stresses to the water environment and aquatic habitats and species in these rivers, this also creates challenges to ensuring security of public water supply and supporting other water abstractions. Currently the Environment Agency estimate that, in approximately 38 per cent of river water bodies in Wales, water is no longer reliably available for new water abstractions.'

3.9.10 Freshwater ecosystems in Wales are subject to a variety of human pressures including pollution, sedimentation, extractive fisheries, invasive/non-native species, and over abstraction. Trends such as population growth, combined with climate-related trends, may significantly impact on the availability of good quality water.

3.9.11 The overall statistics conceal pockets where there may be significant problems due to over-abstraction, high levels of diffuse pollution, leakages, domestic over-consumption and low ecological/biological quality. Some areas within the region may require high demands where settlements or industry are concentrated, and pressures may increase as a result of the programme.

3.9.12 Water management has been identified as a key delivery aspect of the Glastir Advanced Scheme which intends to improve water quality and reduce flood risks on agricultural holdings that fall within the GIS specified targeted geographical areas[122]. The management actions offered in Glastir Advanced aim to reduce water pollution, soil compaction, increase the use of buffer zones and improve water permeability of catchment surfaces.

3.9.13 Full water management reports and nutrient management plans are offered to farmers who participate in the scheme and are based in priority geographical regions. The objective of the management plans is to reduce diffuse pollution caused by fertiliser use and assist farmers to become more strategic and efficient in their management of their farms.

3.9.14 The scheme's objective is to improve water quality and quantity management on agricultural holdings that have been identified as priority water management areas.

3.9.15 The revised Bathing Water Directive 2006/7/EC, comes into effect in 2015, and has updated the way in which water quality is measured,

[122] Welsh Assembly Government, Glastir: New Sustainable Land Management Scheme for Wales, February 2010

focusing on fewer microbiological indicators and setting different standards for inland and coastal bathing sites, namely:

- tighter microbiological standards - to be met by 2015
- two microbiological parameters - Intestinal enterococci and *Escherichia coli* (a faecal coliform)
- water quality classification based on 3 or 4 years monitoring data
- four new classification categories:
    - *excellent - approximately twice as stringent as the current guideline standard*
    - *good - similar to the current guideline standard*
    - *sufficient - stricter than the current mandatory standard*
    - *poor - normally non-compliant waters*

3.9.16 The Water Framework Directive (2006/60/EC) (WFD) aims to take a holistic approach to managing the water environment and ensure that we balance ecological, social and economic values in decision-making. Under the WFD, three River Basin Districts have been established in Wales, two of which extend into England.

3.9.17 In Wales, the first River Basin Management Plans show that in 2009 only thirty three per cent of water bodies were at 'Good' standard, and that by 2015 this would improve to forty one per cent. The ambition is to achieve fifty per cent of water bodies at 'Good' standard, and work towards the delivery of objectives for Protected Areas such as Natura 2000 sites and Bathing Waters.

3.9.18 Whilst farming is not the sole cause of water pollution, it contributes sixty per cent of nitrates, twenty five per cent of phosphorus and seventy five per cent of sediments to the nation's waters[123]. In its response to the EA consultation 'Living Waters for Wales', NRW identified agricultural pollution as one of the two top issues for failure in water quality in Wales[124].Over 150 Water Bodies currently fail because of agricultural activities, including poor slurry management, livestock poaching, erosion of river banks and fields, and run-off from grasslands, arable fields, tracks and farmyards[125]. The RDP will benefit from supporting specific measures that minimise the impact of rural land use on the aquatic environment[126].

[123] Welsh Government (2011) Consultation on the compulsory Good Agricultural Environmental Condition (GAEC) to introduce buffer zones alongside water courses to tackle water pollution from agriculture

[124] NRW (2013) Supporting information for Wales' Challenges & Choices consultation

[125] Ex-ante RDP situation analysis February 2013

3.9.19 Natural Resources Wales is currently preparing a diffuse pollution action plan. This plan, along with the Welsh septic tank registration scheme will help to reduce diffuse pollution from rural sources. This will help to protect and improve the water environment and deliver the targets established in the River Basin Management Plans

3.10 Air quality

3.10.1 Given the diversity of landscape and land cover, the geology, density of settlements, quality of housing, employment patterns, traffic flow and densities of traffic, there are considerable variations in air quality across Wales.

3.10.2 Air quality relates to a number of variables, including carbon monoxide and dioxide, nitrous oxide, particulates, methane, ozone and radon.

3.10.3 In the previous century much of the air pollution problem was associated the burning of fossil fuels such as coal for heating and industrial purposes, leading to smoke emissions containing high levels of sulphur dioxide. The major threat to clean air is now posed by traffic emissions. Petrol and diesel engines emit a wide variety of pollutants, principally carbon monoxide, oxides of nitrogen, volatile organic compounds and particulates, which are having an increasing impact on air quality, particularly in urban areas[127] (see Map 15).

3.10.4 Air quality in some parts of Wales is relatively poor in EU terms[128]. In the past, Wales' weather systems have helped to ameliorate the effects of air pollution, but with increasingly unpredictable patterns of weather there is a possibility of deteriorating quality. A few councils, such as Powys have declared Air Quality Management Areas (AQMA) where air quality consistently exceeded thresholds[129], but these are associated with urban areas and therefore beyond the scope of this report.

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[126] RDP 2014-2020 Agri-environment, Climate and Forestry Working Group Thematic Report – Water(Kyle Young, Simon Neale & David Letellier, EAW) 14 November 2012

[127] For example, Newport local development plan SEA refers to this issue. In the Vale of Glamorgan LDP SEA, the eastern Vale is referred to in this context

[128] http://www.businessgreen.com/bg/news/2187762/exclusive-eu-prepares-legal-action-uks-pollution. accessed 12/02/2013

[129] For example Newtown town centre.

3.10.5 In contrast to the urban environment, ozone, which is a greenhouse gas, can be a health hazard at ground level, and is more likely to occur in rural environments (Map 15)[130]. The different levels of ground level ozone are directly linked to different weather patterns[131].

3.10.6 Significant areas in Wales are designated as radon affected areas. Areas where more than one per cent of homes exceed the Government Action Level for radon include eastern Powys and the north east, particularly in Flintshire, as well as parts of Conwy[132]. In parts of north Pembrokeshire, Anglesey and Gwynedd, the number of homes exceeding the action level may be as high as thirty per cent[133].

3.10.7 It is worth considering the potential of atmospheric pollutants such as NO_2 and SO_2 as sources of acid deposition on upland areas closest to the English Midlands and Merseyside, which may create environmental stress for upland soils, resulting in the potential for cumulative effects linked to agricultural and other activities.

3.11 Climate issues

3.11.1 Climate change relates to several of the baseline themes discussed here, including flood risk, water resources and quality, air quality and biodiversity. It is a critical Welsh Government policy issue:

'Tackling climate change is a fundamental part of delivering sustainable development. Climate change is one of the most important challenges facing the world and the Assembly Government has made a commitment to tackling climate change, resolving that the Government and people of Wales will play the fullest possible part in reducing its carbon footprint. Our commitment to action on climate change is based on a scientific imperative to act and to act urgently to reduce greenhouse gas emissions and deal with the consequences of climate change.' [134]

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[130] Air Quality Forum: http://www.welshairquality.co.uk/trend.php?t=4

[131] Welsh Government (2012): Sustainable Development Indicators for Wales 2012. Cardiff

[132] Conwy LDP SEA 2011

[133] Indicative Atlas of Radon in England and Wales. Miles JCH et al Health Protection Agency Didcot and British Geological Survey Nottingham. 2007

[134] Planning Policy Wales Feb 2011 p44

3.11.2 The same document states that:

'The Assembly Government has set out to achieve annual carbon reduction-equivalent emissions reductions of 3 per cent per year by 2011 in areas of devolved competence, which include land use planning. We are also committed to achieving at least a 40 per cent reduction in all greenhouse gas emissions in Wales by 2020 against a 1990 baseline. This will assist in making a significant contribution to the UK Carbon Budgets'

3.11.3 The State of Environment Report defines outcomes for minimising the effects of climate change and provides information on progress. The main findings on the progress of climate change mitigation measures in Wales are summarised below:

- The estimated emissions in million tonnes of CO_2 equivalent from transport in Wales in 2010 was 6.1. Wales transport emissions accounted for 5per cent of the UK total in 2010

- The land use and land use change and forestry' (LULUCF) sector can have both negative and positive impacts on greenhouse gas emissions. In Wales the sector is generally a small net sink of carbon dioxide, and this sink has slightly increased between 1990 and 2009.

- The indication is that there has been a clear improvement in Wales' resilience to the impacts of climate change.

3.11.4 Based on the Welsh Government's Climate Change Adaptation Strategy and consultation (2007, Chapter 4), it is likely that the continuing trends in climate change are likely to lead to more extreme weather events with an increase in temperatures, resulting in hotter, drier spring and summer conditions, which may impact particularly in the East of Wales and across the border in England placing significant pressure on already stressed water resources.

3.11.5 Later research by Jennifer Francis of Rutgers University and Stephen Vavrus of the University of Wisconsin-Madison[135], suggests that rapid Arctic climate change is directly linked to amplification of the jet stream movements resulting in the high-impact, extreme weather events already

[135]http://www.climatecentral.org/news/arctic-warming-is-altering-weather-patterns-study-shows/.accessed 14/02/2013

experienced in the U.S. and Europe. This may result in warmer winter conditions, and increases in flooding, landslips and soil erosion.

3.11.6 Extreme cold weather may also result from the warming Arctic Ocean and all of these extremes of weather may result in disruptions to productivity, travel to work and access to public services such as schools and hospitals as well as disruptions to the transport infrastructure adversely impacting industry, which will have implications for investment and for economic sustainability.

3.11.7 Wales' coastal climate is moist and mild with certain sheltered areas being comparatively sunny and dry. Local variations in climate are fundamentally controlled by altitude and distance from the sea which means that coastal areas experience cooler summers and milder winters. In contrast, the inland upland areas are regions where these two controlling factors are minimised so creating severe climatic conditions. The high altitude of the mountains causes these areas to be predominantly cloudy and to suffer low temperatures, high rainfall and a high degree of exposure.

3.11.8 Snow can persist on the mountains for long periods during the winter months, causing problems for hill farmers. The combination of these climatic factors with the dramatic relief creates a harsh environment.

3.11.9 Agriculture and land use are particularly relevant to climate change issues. Not only do they have the potential to sequester carbon through appropriate soil and crop management, they are particularly vulnerable to climate change, and therefore they have the incentive and the potential capacity to contribute significantly to mitigate the effects.

3.11.10 Unlike other sectors where the dominant emission is carbon dioxide (CO_2), two other greenhouse gases (GHGs), methane (CH_4) and nitrous oxide (N_2O) – respectively 21 and 310 times more powerful in terms of global warming potential than CO_2 - are strongly linked to the agriculture sector.

3.11.11 The latest evidence[136] indicates that agriculture emitted 5.3 mega tonnes (Mt) of Carbon Dioxide equivalent (CO_2e), while 'Land Use, Land Use Change and Forestry' (LULUCF) sequestered 0.3 Mt CO_2e more than it emitted.

[136] Greenhouse Gas Inventory for 2009

3.11.12 The amalgamated emissions of both sectors at 5.0 Mt CO_2e represent 11.7 per cent of the total Wales emissions of 42.6 Mt CO_2e. However, agriculture is the most significant source sector for CH_4 and N_2O, accounting for fifty four per cent and eighty seven per cent of the total Welsh emissions of these two gases respectively. The Welsh Government is committed to a target of reducing overall GHG emissions by three per cent per annum in areas of devolved competence from 2011, and the agriculture and land use sectors have a key role to play in achieving this target[137].

3.11.13 Most of the methane emission comes from digestive processes in ruminants and from the degradation of animal wastes, whilst nitrous oxide emissions come from the use of inorganic and organic fertilisers. Whilst an obvious conclusion is that a reduction of both livestock and fertiliser would result in reductions of these gases, this would be practically unfeasible, although some reductions have occurred as a result of other drivers. Other options relating to feeds, breeding, transportation, and anaerobic digestion may provide viable solutions.

3.11.14 The release of ammonia can have a significant impact on biodiversity and ecosystems. A compound of nitrogen and hydrogen, it reacts with other compounds in the atmosphere and is readily soluble in water, causing an imbalance in habitat structure and eutrophication. It can also increase acidity in soils through oxidation with nitrates, and therefore in water bodies. Livestock manure and urine accounted for eighty nine per cent of the UK's ammonia emissions[138] in 2010.

3.11.15 The Gothenburg protocol (originally agreed in 1999) has recently been revised and an updated version was agreed in June 2012. The Protocol also sets out a number of requirements signatories must undertake in order to reduce emissions of ammonia including providing guidance and advice to the agricultural sector to manage both nitrogen use and ammonia emissions. Both the National Emissions Ceilings Directive (NECD) and the Integrated Pollution Prevention and Control (IPPC) Directive have established targets for emissions including ammonia.

[137] See National Assembly for Wales (2013). Greenhouse Gas Emissions in Wales. Research paper. February 2013.
[138] National Atmospheric Emissions Inventory 2012. http://naei.defra.gov.uk/ http://naei.defra.gov.uk/ accessed 19/02/2013

3.12 Flood Risk

3.12.1 According to the UK National Ecosystem Assessment Wales chapter (2011), it is estimated that one in six properties in Wales (600,000 people in 357,000 properties, of which 150,000 are residential) is at risk of flooding. The economic risk from flooding to properties and contents was £200 million per annum in 2008. UK climate impact projections quoted in the NEA suggest that average annual natural river flows could reduce by ten to fifteen per cent in Wales by 2050, and natural summer river flows could reduce by fifty per cent or more, with implications for flood hazard regulation and water supply.

3.12.2 The Welsh Government's own estimate (WAG 2007) is that around half a million people live and work on land designated as flood plain in Wales and the asset value invested on flood plain land is estimated at over £8 billion[139].

3.12.3 Since 2005-6, 5,700 properties have benefitted from Environment Agency flood alleviation schemes[140]. The role of the planning system in considering the likely impact of climate change on development locations is obvious, and projects or developments brought forward in response to the proposed funding programme need to be assessed in this light.

3.12.4 Whilst flood risk is an important issue in relation to future climate scenarios, there is no reference to it in relation to the management of land in the uplands. However, the maintenance of soil quality, including its ability to hold moisture, together with schemes that include the management of water courses, increases in woodland and field boundaries, and the restoration of peatlands all have a role to play in water management. Reference might be made to the well-known Pontbren initiative in this regard[141].

[139] Welsh Assembly Government.' Climate Change Adaptation Strategy' - consultation Feb 2007. p26

[140] Environment Agency response to the ERDF Scoping Report

[141] See http://www.coedcymru.org.uk/images/user/5472%20Pontbren%20CS%20v12.pdf

Flooding issues

- **Twenty eight cent of the Welsh coastline** has some form of **artificial sea defence works**

- In downstream and at-risk areas uptake of the Sustainable Drainage Systems (SuDS) schemes is at a relatively early stage and has so far been patchy across local authority areas in Wales

(UK NEA 2011)

- Over **150,000 residential properties**, many **commercial and industrial developments**, other **key infrastructure** like power supplies, transport links and **schools and colleges**, as well as **important environmental and historic sites** are on land **at risk of flooding**

- Around **half a million people live and work on land designated as flood plain in Wales** and the **asset value invested on flood plain land is estimated at over £8 billion of assets**

- Increased frequency of flooding will have an impact on livestock and could damage crops

Welsh Government:
Climate Change Adaptation Strategy -
consultation document Feb 2007

3.13 Waste management

3.13.1 The State of the Environment Report's latest findings on waste management (July 2012) are summarised below:

- The total amount of household waste produced per person in Wales has fallen to 467kg in 2010/11
- In 2005-06, the estimated amount of construction and demolition waste produced in Wales was 12.2 million tonnes
- 191,000 tonnes of waste was produced by the public sector in Wales in 2007, of which forty six per cent was recycled off-site or re-used off site; forty one per cent of public sector waste was landfilled in 2007
- The percentage of local authority municipal waste (excluding abandoned vehicles) reused, recycled or composted in Wales increased to forty five per cent
- The percentage of industrial and commercial waste recycled, composted or re-used in Wales decreased from 64per cent in 2002/03 to forty nine per cent in 2007

- Thirty nine per cent of industrial and commercial waste was sent to landfill in 2007 (3.6 million tonnes), increasing from twenty eight per cent in 2002/03.
- Fifty one per cent of municipal waste (excluding abandoned vehicles) was sent to landfill in 2010/11 - a decrease from ninety three per cent in 2000/01
- 338 companies are Green Dragon certified in 2012; 21 companies achieved the highest rating (Level 5), an increase from 17 in 2011
- Forty eight per cent of local authority municipal waste was recycled March 2011-12
- The residual household waste produced per person in Wales fell to 56 kilograms per person in January to March 2012, from 65 kilograms per person in January to March 2011

3.13.2 There is a clear upward trend in the amount of waste reused, recycled or composted, and this has boosted employment in this sector. Some of the figures may be open to interpretation, since they may have been gathered and aggregated in different ways, and may be out of date.

3.13.3 Whilst there are no references to farm waste in the agricultural statistics, this is of particular relevance to the RDP. Farm waste can emanate from a wide range of agricultural activity, including pesticide containers, silage wrap, tyres, batteries and oil. What constitutes agricultural waste, and how it is disposed, is a fairly complex issue.

3.13.4 Agricultural waste was excluded from the UK waste management control by section 75(7)(c) of the Environment Act 1990. The introduction of the Waste Framework, Hazardous Waste and Landfill Directives required the introduction of the 2006 Waste Management Regulations to include agricultural waste.

3.13.5 Prior to the introduction of the regulations, it was customary for much of the waste to be burned or dumped or buried at a specific location on farm. The regulations require appropriate storage, and disposal off-farm. Under the Glastir entry-level scheme, farmers are required, as part of the GAEC standards, to

"keep the farm clear of rubbish and avoid dumping rubbish such as derelict vehicles and disused domestic appliances, in the fields or curtilage of the farmstead."

Farmers who wish to continue to use an on-farm dump must apply for a licence under the Landfill Directive, although waste can be stored for up to twelve months without the need for a licence.

3.13.6 Livestock urine, manure and slurry is not regarded as waste where it is for agricultural purposes, although an exemption to the Environment Permitting Regulations (2010) has to be obtained[142]. Organic waste and anaerobic digestate can also be used on farm without contravention of the regulations.

3.13.7 Farmers are also able to use road planings for repairing tracks, without notification up to 150 tonnes[143].

3.13.8 Fallen stock cannot be buried, but must either be incinerated in an approved system, or disposed of off-farm. Where incinerated, the ash cannot be spread but must be disposed of at a landfill site (with the exception of ash from pig or poultry carcasses).

3.13.9 Farm waste also comes in the form of leached fertilisers entering watercourses from fields, and in the form of gases such as CH_4 emissions from digestive processes in ruminants

3.14 Transport infrastructure

'Rising concentrations of greenhouse gases are recognised to be causing global climate change. Transport, through the use of fossil fuels, is one of several key activities that produce greenhouse gases, and accounts for around 16per cent of CO_2 emissions (around 14 per cent of greenhouse gas emissions) in Wales.[144]'

3.14.1 Although greenhouse gas emissions relating to transport fell by over five per cent between 2008 and 2010[145], transport is nonetheless one of the

[142] The Environment Permitting Regulations (2010) are currently subject to review. Proposed amendments can be found at http://www.defra.gov.uk/consult/2013/02/07/env-permitting-1302/

[143] The exemption under paragraph 19 of the previous Waste Licensing Regulations has been replaced by a new exemption U1. The Environment Agency's position is that farmers will not be required to register a U1 exemption provided they remain within the 150 tonne limit (see EA Regulatory Position Statement 2010), though this may be subject to review.

[144] 'One Wales - Connecting the Nation' - The Wales Transport Strategy April 2008 (p5)

[145] National Atmospheric Emissions Inventory: http://naei.defra.gov.uk/

key factors in measuring Wales' ecological footprint, which is currently unsustainable.

3.14.2 There has been little change in the main modes of travel to work since 1997 in both Wales and the UK. In 2011 the situation was as follows:

- Eighty one per cent of the population travelled to work by car, van, minibus or works van
- Twelve per cent by walking or cycling and
- Eight per cent used other modes of transport in Wales.
- Almost as many children travel to school by car (33.6 per cent) as by walking (36.4 per cent),
- the numbers travelling to school by bus or coach have reduced since 2002/3, with 23.9 per cent travelling in this way[146]
- bus passenger numbers have fallen from about 118 million in 2009/10 to 113 million in 2010/11,
- rail passenger numbers (for journeys either beginning or ending in Wales) have increased from some 25 million 2008/09 to 27 million in 2010/11.
- Sixty-nine per cent of these journeys were entirely within Wales,
- For thirty nine per cent of these, Cardiff was the destination of rail passenger journeys[147]

3.14.3 An efficient and sustainable bus network is of key importance to certain groups, such as young families, retired people, and people living in rural communities. Bus services in rural Wales are typically less frequent than services in urban areas, where a denser population and more passengers are able to support a more comprehensive network. This is especially so in the evenings and at weekends. The lack of competition and the high costs of running services is likely to result in isolation and limited access to services by public transport, a situation likely to be exacerbated by the recent funding cuts as a result of the economic downturn. Map 16 demonstrates the length of time typically taken to access key centres, where the majority of employment opportunities and services are likely to be located.[148]

[146] SoE Report 2012

[147] Statistical Bulletin. Rail transport October 30 2012

[148] RDP Annex 2 situation analysis p137 accessed 01/02/2103

3.14.4 It is likely that RDP funding will become an increasingly important alternative source of investment in capital projects and in running bus and community transport services[149].

3.14.5 Rail provision is relatively poor in rural Wales. Main line services exist along the North Wales coast and through Mid Wales from Shrewsbury to Aberystwyth, and from the South Wales main line northwards through to Shrewsbury. These main routes are supplemented by more local services along the west coast from Aberystwyth to Pwllhelli, from Swansea via Llandrindod Wells to Shrewsbury and from Llandudno to Blaenau Ffestiniog.

3.14.6 Welsh Government and Network Rail have undertaken infrastructure improvements on the Aberystwyth - Shrewsbury Main Line to increase the frequency of services. Network Rail, which owns and maintains the rail infrastructure network, can fund some improvements but its funding decisions generally favour more commercial routes. Arriva Trains Wales provide services on the lines throughout Wales, but few in the region are commercially viable and as a result rely heavily on subsidy from Central Government.

3.15 Energy

3.15.1 Climate change adaptation is closely linked to the use of energy - its generation, delivery and consumption patterns, and critically its conservation. The Welsh Government's 'Renewable Energy Route Map' (2008) provides indicative data on energy demand, supply and emissions.

3.15.2 The SoE Report (2012) considers energy use and environmental standards in new buildings in Wales. In the case of energy savings from public sector buildings, it says that there has been little overall change in energy consumption since 2005. In 2008, gas accounted for 60per cent of public sector energy use, electricity accounted for thirty six per cent, whilst oil and coal combined accounted for four per cent of public sector energy use.

3.15.3 The report points out that estimates of public sector energy use in Wales have been back-calculated from greenhouse gas emissions (GHG) inventory analysis and UK energy statistics. It indicates that these data are experimental estimates and very uncertain, especially as they do not take into account fluctuating conditions.

[149] See ex-ante RDP situation analysis 18 February 2013. Paragraph 592, p147

3.15.4 'A Low Carbon Revolution' - the Welsh Government's Energy Policy Statement (2010) provides some general information about energy consumption in Wales (p9):

'Currently, in the UK the average person's daily energy consumption (excluding energy related to food and imported goods) is around 125 kilowatt hours per day per person (kWh/d/p).

Of this 125 kWh/d/p, after taking into account conversion losses, we use a third for heating, a third for transport and a third for electrical power. The average electrical power consumption per person per day in Wales is approximately 22 kWh/d/p, (slightly higher than the UK average of 18 kWh/d/p. To put this into context this is equivalent to every person in Wales leaving twenty-two 40-watt light bulbs on for 24 hours every day.'

3.15.5 The rural community has a key role to play in contributing to the wider Wales renewable energy market, as well as reducing the carbon footprint of Wales through energy efficiency. This contribution can include:

- Production of biomass feedstock e.g. woodfuel, energy crops
- Utilisation of natural resources for power generation such as wind, solar and hydro – for supply to the National Grid or for use on-site
- Energy efficiency within rural businesses

3.15.6 The Welsh Government is currently providing support through a number of mechanisms within the scope of the current RDP:

- Farming Connect – funded through the current Rural Development Plan, this mechanism provides a range of support to farmers on renewable energy opportunities, including one-to-one mentoring, events and clinics, discussion groups and factsheets, as well as planning surgeries to consider the planning implications of renewable energy proposals.

- Glastir – Efficiency Grants - A capital grant scheme available to farmers and land managers who hold a Glastir Entry contract within the Glastir land management scheme, aimed at improving business and resource efficiency, including energy efficiency, and reducing carbon emissions of agricultural and horticultural holdings.

- Wood Energy Business Scheme 2 - originally launched in 2004, this is the current four-year project running between 2009 and 2013, managed by Forestry Commission Wales. The scheme provided capital grant support to businesses for wood fuel heating systems and processing equipment to develop the sustainable and renewable wood heat market across Wales. The scheme currently offers grants for woodfuel processing businesses, consultancy, advice and training.

- Woodfuel Supply Chain Development – funded through the Supply Chain Efficiency scheme. This 3 yr project seeks to establish a quality assurance scheme and a reliable log supply chain from producers to customers.

- Research and Development – Welsh Government has contributed to a range of research projects including the commercial production of crops such as willow and other novel energy crops.

3.15.7 The UK Renewable Energy Roadmap (2011) identifies biomass electricity and biomass heat as two of the eight technologies with the greatest potential to help the UK meet its fifteen per cent target for renewable energy generation by 2020. DECC makes the following projections for UK biomass by 2020:

- installed biomass electricity generation capacity of between 4 to 6GW, providing an annual generation capacity of between 32 and 48TWh.

- a similar annual generation of between 35 and 50TWh of biomass heat by 2020.

3.15.8 The volume of wood going into biomass for fuel has grown significantly over the last 10 years. It has grown from less than 100,000 tonnes a year of logfuel for domestic homes to becoming an industrial fuel in power stations as well as a raw material for pellet and chip production of at least 300,000 tonnes a year[150].

3.15.9 Europe is already facing a biomass shortage with demand for biomass expected to increase by fifty per cent over the next 10 years[151].

[150] For a discussion on biomass in Wales, see Parliamentary Welsh Affairs Select Committee 3rd Report Section 9. Biomass http://www.publications.parliament.uk/pa/cm200506/cmselect/cmwelaf/876/87611.htm accessed 02/03/2013

[151] http://www.ifpta.org/content/market-analysis/EU-faces-biomass-shortage-without-new-sources accessed 02/03/2013

Production of biomass within Welsh woodlands has increased significantly over the past decade. For example, in 2004 the Welsh Government Estate sold less than 1000 cubic metres of wood as fuel wood. In 2011, the quantity had increased to over 100,000 cubic metres[152]. Within the UK alone, the total amount of biomass burnt each year will increase 10 fold from 5 million tonnes to 50 million tonnes once all of the existing and currently proposed biomass power stations come into operation. This sudden and increased demand is causing a surge in imported biomass fuels from thirteen per cent to sixty eight per cent, with imports being 3 times greater than the UK's current wood production alone.[153]

3.15.10 The Glastir-Woodlands Creation and Glastir-Woodlands Management schemes promote the planting and active management of small scale farm woodland. Much of the material from the undermanaged woodlands is likely to be of little interest to large scale biomass generators because of a weak supply chain, species and form. It is however, well suited to storage, drying and use for local heat as pellet, chip or log, hence the use of wood for fuel offers a new market for those owners managing their woodlands.

3.15.11 Renewable Energy and Energy Efficiency is one of the four ERDF 2014-2020 priorities. The Welsh European Funding Office has put in place measures to ensure that the ERDF, RDP and indeed ESF programmes complement each other with regard to renewable energy and energy efficiency.

3.15.12 Wales has a significant potential to generate energy using its natural resources - wind, tide, hydro, solar and biomass. Whilst attractive, all these schemes have the potential for significant cumulative and indirect effects, through changes to landscape and seascape, and terrestrial and marine biodiversity and ecosystems, and therefore they are not without constraints.

[152] RDP 2014-2020 Agri-environment, Climate and Forestry Working Group Thematic Report: Forestry (Bill MacDonald with David Lloyd-Thomas, Sara Hetherington, Dewi Jones, Kevin Taylor) October 2012

[153] http://www.rspb.org.uk/news/288724-study-exposes-green-failings-of-wood-fuel-power-plants- accessed 02/03/2013

3.16 Agriculture

3.16.1 Agriculture employs about 59,500 people[154] (including seasonal and part-time workers) and contributed in excess of £400 million to the Welsh economy in 2003[155] in provisioning services only. The industry contributes significantly to the economic, social, environmental and cultural cohesion of rural Wales. Many farmers are generally conservative in their approach to the industry, which may largely be linked to an aging farming population with few opportunities for young farmers to enter the industry. As a result the tendency of farmers is to perceive themselves solely as producers of food to the exclusion of other possibilities.

3.16.2 Sixty per cent of the land of Wales is more than 150 m above sea level, and twenty seven per cent is more than 300 m above sea level. Soil and climatic conditions suitable for cultivation and sufficiently fertile to support arable crops are described as falling within Agricultural Land Classes Grade 1–3. Less than five per cent of Welsh farmland land is currently under crops, the majority under grass.

3.16.3 Geology and climate have contributed to the generally low agricultural fertility of Wales's soils, and there are large expanses of substrate with high organic/carbon content, including major deposits of peat (see section 3.8). Of the 2.1 million Ha of land in Wales, 1.6 million Ha is classed as Less Favoured Area (LFA), of which 1.1 million ha is used for agriculture (sixty nine per cent). The LFA boundary is currently under review across all European Member States, and whilst changes to the current boundary are likely to occur, the revised boundary for Wales is not yet final[156].

3.16.4 In these unenclosed uplands the inherently low productivity puts an ecological and economic constraint on the extent to which habitats can be improved so that improved grassland and arable and horticulture are rare in these areas[157]

[154] Welsh Government: Survey of Agriculture, June 2011

[155] National Ecosystem Assessment. Chapter 20 Wales. p981

[156] Welsh Government. RDP Annex 2. Situation Analysis. Accessed 01/02/2013

[157] Countryside Survey 2008

3.16.5 It was estimated in 2007[158] that improved grassland occupied thirty four per cent of the total agricultural land in Wales. The most improved grasslands tend to be in the lowlands where they dominate the landscape. Smaller areas of less productive habitats and landscape features are largely scattered in this intensively managed landscape. Although such intensive management has the potential to negatively impact on these remnant biologically valuable habitats, there is also potential for these patches to act as sources for re-colonisation when management intensity is reduced.

3.16.6 The area of agricultural land increased in the first half of the 20th century, with a slow decline in the second half. The area of permanent pasture has expanded at the expense of rough grazing, which is likely to have had a significant impact on biodiversity associated with semi-natural grassland. The area under cereals and crops has decreased significantly, with the majority of arable currently under improved grassland[159].

3.16.7 The total area of agricultural land has continued to decrease since 1994, with a significant reduction of 45-50,000Ha occurring in 1999. Within this total area of agricultural land, the proportion of different types of farmland has changed:

- Permanent grassland increased steadily from fifty five per cent in 1994 to sixty two per cent in 2008.
- Rough grazing decreased steadily from twenty nine per cent in 1994 to twenty three per cent in 2008.
- Temporary grassland decreased steadily from nine per cent in 1994 to five per cent in 2008.
- Total tillage mostly remained stable at around five per cent.
- Woodland was stable at around two per cent from 1994 to 2003, but increased thereafter to three per cent by 2006 (the latest date for which data has been made available)[160]

3.16.8 Sheep numbers increased relatively slowly until the 1950s, since when numbers increased rapidly, with nearly a three-fold increase from immediate post-war numbers until the late 1990's reaching a peak of 12 million (the highest numbers since records began in the late 19th century),

[158] Ibid.

[159] Blackstock et al (2010): 'Habitat Survey of Wales'

[160] Welsh Assembly Government (2008). Welsh Agricultural Statistics. Stats Wales.

when they began to decline again, prior to the outbreak of Foot and Mouth disease in 2001. Sheep numbers currently stand at about 8.6 million[161].

3.16.9 Between 2000 and 2010, the number of dairy holdings reduced by 1,537, forty four per cent. However, the decline in numbers of holdings and cows has not resulted in a decline in milk production[162]

3.16.10 Farming is nowadays dominated by sheep and beef production and the dairy sector with the arable sector accounting for some ten per cent of agricultural output. Average farm size is some 35Ha, relatively small compared to the rest of the UK, and dominated by family run farm enterprises.

3.16.11 The farming industry is economically disadvantaged because of distances from major processors and markets and the scale of production at farm level which is smaller than UK competitors. Also, there are very few sustained co-operation activities amongst farmers[163].

3.16.12 About eight per cent of farmland in Wales is under organic management, higher than the UK average. Organic production is supported through the RDP in Wales and Welsh Government's aim is to enhance market opportunities for producers and consumers. Supporting the organic food market presents additional environmental benefits and contributes to wider Welsh Government objectives in relation to climate change mitigation and environmental protection[164].

3.16.13 Animal welfare is a key concern for the industry, especially in the context of climate change. Bluetongue, which affects, cattle, sheep and goats, infected large areas of mainland Northern Europe, including Great Britain, for the first time in 2007/8. Schmallenberg virus (SBV), a new virus of cattle, sheep and goats, was detected for the first time in Wales in September 2012 and could potentially inflict immense damage on the Welsh livestock sector.

[161] Welsh Government StatsWales (2012). Farming Facts and Figures 2012.

[162] See http://milk.withclarity.co.uk/ accessed 07/02/2013; see also Hawkins (2011). House of Commons library statistics: Dairy Industry in the UK

[163] ibid.

[164] RDP 2014-2020 Agri-environment, Climate and Forestry Working Group Thematic Report – Organic farming (Kevin Taylor, Adriana Kiss and Frances Dixon) Undated

3.16.14 Past incidents such as the BSE crisis and the resulting global ban on beef exports, and the Foot and Mouth Disease epidemic in 2001, illustrate the impact that animal disease can have on the rural community.

3.16.15 A key challenge facing Welsh Government and industry is addressing the issue of bovine TB. The Welsh Government has set up a comprehensive TB Eradication Programme aimed at tackling all sources of the infection.

3.16.16 As well as these obvious examples, there are a number of non-notifiable diseases that are costly in time and money, and therefore undermine the agriculture industry's potential to deliver on production and environmental services. Bio-safety and risk management are clear priority areas for the RDP.

3.16.17 Nitrate Vulnerable Zones (NVZs) are areas designated under the EU Nitrates Directive (91/676/EEC), which aims to reduce water pollution caused by nitrates from agricultural sources. Currently 2.3 per cent of the land area of Wales as NVZs and introduced a strengthened range of measures in the Nitrates Action Programme that farms located within NVZs must implement to comply with the Directive. New designations came into force in January 2013, following the statutory four-yearly review of the NVZ boundaries.

3.16.18 Natural Resources Wales is currently responsible for enforcement of the Nitrates Directive in Wales, including Action Programme measures. The Action Programme requirements also fall under the scope of the Single Payment Scheme (SPS) cross-compliance measures. Accordingly, where relevant, inspections assess compliance with the NVZ Action Programme, measures and penalties can be applied to SPS payments where breaches are found.

3.16.19 The environment of many areas of Wales is under pressure from decades of intensive agricultural practice. As well as the more obvious visual and biodiversity impacts, there have been severe impacts on the quality of water courses and soils, and potentially on flood attenuation. The agriculture industry also contributes to greenhouse gas emissions.

3.17 Forestry and woodland

3.17.1 Wales has 304,000 hectares of woodland, of which 167,000 hectares (fifty per cent) is conifer forest and 137,000 hectares (forty five per cent) is broadleaved woodland. In comparison to most European countries Wales

has a very low level of woodland cover with approximately fifteen per cent of the country being woodland compared to twenty nine per cent in France, thirty two per cent in Germany and an average of thirty seven per cent in the European Union[165]

3.17.2 The Welsh Government owns 114,000 hectares or 37.5 per cent of the woodland in Wales and this is managed by Natural Resources Wales, the new single body in Wales. The remaining 190,000 hectares or 62.5 per cent of woodland is privately owned by a mixture of forestry companies, charitable bodies or private individuals, including many farmers[166].

Table 6: Area of woodland by ownership and forest type at 31 March 2012[167]

Wales 000s hectares	**Owner**	**Conifers**	**Broadleaves**	**Total**
	FCW	98	16	**114**
	Non-FCW	96	121	**190**
	Total	**167**	**137**	**304**

3.17.3 Responsibility for forestry in Wales was devolved to the Welsh Government in 1999 and the subsequent publication and revision of the Welsh Government's Strategy for trees and woodlands, *Woodlands for Wales*, sets out its long term vision for forestry. The Strategy encourages the use of access to woodland for education and improving the health of the public through outdoor recreation. It describes the Government's role in supporting the Welsh forest and tourist industries and in safeguarding the forest environment and its biodiversity through the management of the many habitats within the forest.

3.17.4 The Government's stated intention is to move away from extensive areas of clear felling and towards other management systems in Welsh woodlands, and to increase the area of native broadleaved trees through the restoration of ancient woodland and the planting of new woodlands. It seeks to better adapt Welsh woodlands to the impact of climate change through the use of a greater diversity of tree species and it seeks to

[165] See House of Lords EU Committee (2010). Adapting to climate change: EU agriculture and forestry http://www.publications.parliament.uk/pa/ld200910/ldselect/ldeucom/91/10011306.htm accessed 20/02/2013

[166] National Forest Inventory 2011

[167] Forestry Commission, Forestry Statistics 2011 using 2010 National Forest Inventory data. Broadleaves include coppice and coppice with standards.

mitigate the impacts of climate change through increasing the area of woodland, bringing woodland into active management and using woodlands and trees in the management of water and provision of urban shade. One of the most important mechanisms to achieving this is through support from grant aid.

3.17.5 Around half of the total area of Welsh Woodland can be said to be managed – based on the fact that it has a recognised plan or is receiving grant aid for management. It is this half that produces nearly all the timber product and the majority of the formal public access and benefits. The majority of this managed woodland is conifer woodland established between 1945 and 1980.

3.17.6 Many of the unmanaged woodlands in Wales are fragments of broadleaved woodland, frequently remnants of old estate woodland which have received little management since the break-up of the large estates in Wales after the first and second World Wars. The economic drivers which sustained the management of these woodlands (production of tools and household implements) have long since ceased. Access to such woodland is often highly restricted, having been designed originally for horses and carts.

3.17.7 Although these woodlands can be biologically highly diverse, the fact of their fragmented nature limits their current values as wildlife refuges and corridors. Although the area of woodland has increased since the 1940's, much of this has been via coniferous plantation, whilst the broadleaved fragments remain under pressure from grazing and a lack of management to permit regeneration and spreading. On the other hand, some woodlands benefit from grazing, and a failure to maintain such a system can result in a reduction in biodiversity[168].

3.17.8 Woodland has an important role in sequestering carbon and as a sink for carbon historically sequestered. Maintaining woodland cover, and managing existing woodland so as to prevent loss of woodland is important to preserve this carbon sink.

3.17.9 Timber processing is a low margin, heavily regulated sector, that operates in an international market. Its raw material comes from rural locations, often using a rural road network that was not designed to carry large timber lorries. The transportation of timber is a key challenge: Welsh

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haulage costs compare poorly with those of international producers and are very sensitive to increases in the price of fuel. Locally, the environmental impacts of timber haulage can be considerable.

3.17.10 As well as their traditional role of growing timber for the wood processing industries, the forests of Wales also now have an increasing role to play in supporting renewable energy technologies, either directly as logs, chips or pellets, or indirectly as sites for wind and hydro-electricity.

3.17.11 In 2010, *Phytophthora ramorum* (Pr), a fungus-like pathogen, was found to be infecting large numbers of Japanese larch trees especially in South Wales. By June 2012, the area of infected larch woodland stood at 1200ha, approximately ten per cent of the Welsh crop[169]. Where Pr is discovered in woodlands, a Statutory Plant Health Notice (SPHN) is issued, requiring the mandatory felling of all infected trees and any in close proximity that could yet harbour the pathogen. In November 2013 the percentage of woodland under this notice stood at 30.2 per cent, and it is estimated that all larch tress in Wales will be lost by 2040.

3.17.12 Where woodlands are felled under the terms of a SPHN, unlike a conditional felling licence, there is no requirement to re-stock the area with trees, which could lead to a severe loss of woodland cover, thwarting Wales' target to create a net additional 100,000ha of new woodland by 2030[170].

3.17.13 It is worth noting that *P. ramorum* has been discovered in European larch and it also infects many other plants (e.g. rhododendron, bilberry, beech, yew, western hemlock and sorbus).

3.17.14 In October 2012 a new disease in the native European Ash (*Fraxinus excelsior*) was notified - *Chalara fraxiniae* which causes the disease known as Ash Dieback. This disease has wiped out nearly all the Ash trees across large swathes of Northern Europe and if this pattern is confirmed in the UK would have a significant environmental and social impact. The disease was confirmed in Wales in October 2012[171].The incidence of new pathogens impacting on UK forestry has dramatically

[169] See http://www.forestry.gov.uk/newsrele.nsf/WebPressReleases/11FB60906B36B2C68025773D005CD276 accessed 20/02/2013

[170]See IWA Conference, Cardiff 9 July 2012 Growing our woodlands in Wales. Institute for Welsh Affairs

[171] (http://www.forestry.gov.uk/forestry/INFD-8Z6J87).

increased in the last decade. Twenty-seven such pathogens are highlighted in the Operational Programme. Climate change may lead to increased threats from pathogens not currently present in Wales.

3.17.15 The move towards more diverse woodlands with a mixture of species and more uneven age structure should result in woodland that is better able to withstand these damaging threats.

3.18 Rural-based tourism

3.18.1 Rural tourism is generally understood to include tourism activities that take place outside urban areas in the countryside or along the rural coast. It is difficult to define statistically because it does not comply easily with administrative boundaries that are used to collect statistical data, and it is highly dispersed in terms of activities and providers at many levels.

3.18.2 In the context of rural Wales, both inland and coastal tourism form part of an economically important sector. Based upon the exceptional quality of its landscape, natural environment and rich biodiversity, together with its strong sense of culture and heritage it attracts large numbers of visitors. The total tourism spend in Wales in 2011 was £2.026 billion, based on an estimate of 10.5 million visits[172]. It was estimated that about fifty per cent of visits were to small town and rural locations, with approximately forty six per cent of the total spend. Of these numbers, the nine predominantly rural counties accounted for sixty eight per cent of all trips and sixty nine per cent of all spend (£1,052 million).

3.18.3 Tourism is a significant employer. According to the Business Register and Employment Survey, rural Wales is highly dependent on tourism employment with an average of twelve per cent compared to an all Wales total of ten per cent. In Conwy and Pembrokeshire tourism employment accounts for almost 1 in 5 jobs.

3.18.4 Rural tourism cannot be relocated away from rural areas - that is its nature and the root of its potential. It has a significant environmental potential as well as an economic and social one, which can be positive as well as negative.

3.18.5 Rural tourism is closely tied into the environment, whether it is activity based, such as walking, climbing, fishing, boating, caving or cycling, or based on the rural heritage of Wales, involving visits to museums, castles,

[172] Great Britain Tourism Survey

archaeology, great houses or villages. Some areas and sites are more sensitive to certain activities such as motor sport or power boating, and such activities should be located in robust sites that can withstand the impacts.

3.18.6 The tourism industry generally recognises that many of the above activities depend on high quality environments to sustain themselves, and that it is in its interest to protect and enhance them. Coarse, game and sea fishing, for example, rely on high quality freshwater and marine ecosystems.

3.18.7 Wildlife tourism relies heavily on high quality ecosystems. Visits to see red kites, and more recently ospreys, are important locally in terms of jobs, and also of local support for conservation measures. In some cases re-introduction of species such as European beaver have been controversial, but where appropriately managed, may be of significant tourism interest.

3.18.8 Perhaps not widely recognised is the increasing role played by 'faith tourism' that links churches and chapels in rural communities. This is of particular interest to groups and individuals who have emigrated and who have a particular interest in genealogy, as well as architecture and social history. Interestingly, these initiatives seek to promote walking as an element of pilgrimage experiences, which may support health and well-being objectives. Furthermore, churches and chapels may also be linked to sites of significant biodiversity interest.

3.18.9 There is increasing evidence of a link between exercise and contact with nature and mental and physical health[173].

3.18.10 Perhaps the most significant environmental factor has to do with transport. It is estimated that eighty eight per cent of visitors travel by car to reach rural Wales and most of these continue to use the car to travel around Wales. Most visitors drive over 300 miles to and from their holiday and a further 300 miles or more a week while in Wales[174].

3.18.11 The 2009 Wales Rural Observatory report into deep rural communities highlights some of the difficulties faced by rural communities in accessing

[173] Pretty J et al. The mental and physical health outcomes of green exercise. International Journal of Environmental Health Research Volume 15, Issue 5, 2005

[174] Brecon Beacons National Park Visitor Transport Report.

public transport[175], and this is reinforced by the Observatory's 2010 rural services survey[176] which indicated that peak hour bus services were fairly limited for large parts of rural Wales. Many respondents cited inconvenience and expense as critical issues.

3.18.12 Continuing rises in fuel prices, increasing concern for environmental issues may result in either increased visits as more choose to holiday locally, or fewer visits as a result of fewer international visitors. However, it presents an opportunity in that once arrived, tourists may be incentivised to use public transport as a cheaper alternative to the car, especially if this could be packaged with reduced entry fees and other incentives. Destination packaging will also reduce the need to travel more widely.

3.19 Ecological footprint

3.19.1 Ecological footprint is an indicator of the total environmental demand that is made on the planet. It is presented in terms of global hectares (gHa), which represents the amount of land required both to deliver the demands of a population in terms of food, water, fibre and fuel, natural resources and spiritual and recreational opportunities, and to absorb the impacts of that population in terms of pollution and waste. It is associated with the concept of 'ecosystem services'. Housing, travel and food are the main criteria used in the calculation, and both direct and indirect consumer impacts are assessed.

3.19.2 Wales' ecological footprint had risen at a rate of about 1.3 per cent between 1990 and 2003, in line with a growth in Gross Added Value (GVA)[177]. Had this trend continued, it would have been likely that by 2020 Wales' ecological footprint would have been twenty per cent higher than it was in 1990. The current footprint is under review[178], but in the light of the economic downturn, this may have been reversed since 2008.

[175] Wales Rural Observatory (2009). Deep Rural Communities. p114

[176] Wales Rural Observatory (2010). Rural Services Survey. pp34-37

[177] E. Dawkins, A. Paul, J. Barrett, J. Minx and K. Scott (2008). Wales' Ecological Footprint: Scenarios to 2020. Stockholm Environment Institute

[178] http://www.government-online.net/calculating-wales-ecological-footprint/

3.19.3 The most recent calculation (2006)[179] is that Wales' ecological footprint is about 4.4 gha, which is a significant reduction from the 2003 average figure of 5.16 gha.

3.19.4 Rural Wales appears to have higher than average ecological footprints (Map 17). This is likely to be a reflection of energy demands, travel needs and the dispersed delivery of services including shops[180].

3.19.5 The intention of the Welsh Government is to reduce the national ecological footprint to 1.88 gha per person within the lifetime of a generation[181].

3.20 Interactions

3.20.1 These issues cannot be considered in isolation from each other, or from the wider social and economic contexts in which they are set. Impacts on any of these themes will have adverse or positive effects on others to a greater or lesser extent, and such impacts are almost entirely anthropogenic. Decisions that affect the landscape, biodiversity or historic and cultural heritage of rural Wales will impact on its economy through losses in tourism income or a reluctance to relocate to or invest in degraded, unattractive regions. Conversely, a failure to invest in, say sympathetic economic development will result in losses in income or the inability to increase income, and may result in a lack of funds for conservation and for social purposes.

3.20.2 Climate dynamics indicate that there will be changes to biodiversity, with (some would argue) gains and some losses, but this is unpredictable as is the overall net impact. Habitat and species gains and losses relate to wider ecosystems that may become stressed as a result. A change in composition of plant or tree species to ones which are more resilient to change may lead to a change in invertebrate numbers and types; new predatory or invasive bird and mammal species from the Continent or Mediterranean may impact on other more vulnerable species.

3.20.3 If current climate trends continue, there will be habitat change, with wetter habitats in some areas and perhaps drier conditions elsewhere. It

[179] One Wales One Planet. Annual Sustainable Development Report 2009-10

[180] See http://wales.gov.uk/docs/desh/publications/110413walesecofootprintscenarios2020.pdf

[181] ibid.

is possible that changes will occur in the uplands, with some abandonment or reductions in agricultural productivity[182]. There may be changes in woodland, hedgerow and river bankside management systems to mitigate the effects of runoff.

3.20.4 Climate change may also have significant effects on settlement patterns, agricultural productivity and other activities in the longer term and the planning system will increasingly need to take this into account.

3.21 Summary of issues

3.21.1 This section summarises the key issues that relate to the environmental baseline. These issues have implications for the proposed RDP, which are discussed in Appendix 6.

Table 7: Key environmental issues

Population and human health	Some areas lack easily accessible **open space**. Stress related illnesses from **poor living and working conditions**, as well as **unemployment**; heat and **fuel poverty**; poor diets leading to **obesity**; illnesses and injuries at work; and poor social/private rented **housing standards** are contributory factors in health problems in Wales. In some areas, **poor air quality** is an issue.
Biodiversity	About **sixty per cent of SACs**, and a number of Biodiversity Action Plan species and habitats are in **unfavourable condition**, especially on the coast. Pressures can come from **visitor numbers** on some sites, changes in weather patterns, development, **over- or undergrazing**, pollution, nutrient enrichment and eutrophication, sediment deposits, **invasive species,** inappropriate planting, **over abstraction** and overfishing. In some areas **coastal squeeze** resulting in significant saltmarsh and other marginal habitats.
Landscape	Landscapes that are not formally designated may be **vulnerable to inappropriate development** that erodes their character. Agricultural development, forestry and road schemes, as well as buildings in rural areas need to be sensitive to their settings. At the same time, some parts of protected landscapes suffer from **tourism impacts**.
Culture, architecture and archaeology	**Over twenty five per cent of Wales' listed buildings are either 'at risk' or 'vulnerable'**. Whilst nearly all of Wales' ancient monuments are stable or improving, climate change and changes in agricultural us may create new challenges.

[182] This in turn may result in a higher demand for imported food. We do not offer a detailed analysis of how much food produced in Wales is consumed in Wales – in future we may consume more indigenously grown food and export less. Lamb, for example is currently both imported and exported in large quantities.

	Historic buildings and their settings, and the wider landscape, are under pressure from development. The number of people who can speak Welsh has **decreased slightly** since 2001, although the number who can understand but not speak Welsh has increased slightly.
Soil quality and structure	Development, changes in agriculture (especially intensification) and climate change contribute to a **loss in soil carbon and structure**. There have been **changes in hydrology** and **erosion** due to changes in rainfall patterns and agriculture. The need to maintain best quality agricultural land in the face of development pressure may result in losses of less productive land which may be valuable for carbon sequestration.
Water resource	About **23.5 per cent of water supply is lost to leakages**; there has been a **significant increase in abstracted water**, mainly for electricity supply. About **thirty eight per cent of river waters are not reliable for new abstractions** - there may be an increased demand due to population growth.
Water quality	**Pollution from flooded mines** continues to present a challenge. **Diffuse pollution from other sources including agriculture** is exacerbated by changing weather patterns with sudden flooding. There is a potential threat to coastal water quality as a result of increases in storm events. Livestock bank poaching reduces water quality. Currently, **about thirty three per cent of coastal waters are not of 'good' ecological quality**, and the pattern for terrestrial water bodies is mixed.
Air quality	**Radon gas** presents a significant health hazard in parts of rural Wales. Under certain weather conditions, **ozone** can also present a hazard to health locally.
Climate	A number of changes in weather patterns are predicted, including summer water shortages; **increases in amounts and intensity of winter rainfall**, with **milder winters**; **hotter, drier summers**; **increases in sudden storms**. These will result in **rapid build up of river and drainage systems**; increases in **storm induced coastal erosion** and subsidence; **ecosystem and biodiversity changes** with some species and habitat losses and gains.
Flood risk	Twenty eight per cent of the Welsh coastline has sea defence infrastructure; about **1 in 6 properties is at risk from flooding** - this will be significantly higher locally - the **economic cost of flooding is estimated at more than £200 million per annum**. River flows are predicted to reduce overall, but with sudden rapid flows related to turbulent weather. In some areas, natural flood systems have been restored, but in many places such systems have been lost through development or artificial drainage for

	agriculture. Loss of coastal margins could increase likelihood of flood risk.
Waste	The amount of municipal waste recycled, reused or composted has increased from eighteen per cent in 2003/4 to forty eight per cent in 2011/12. Having peaked in 2005/6, the total amount of waste generated has decreased since 2000 by about 95,000 tonnes per annum. **Farm waste comes in the form of leached fertilisers entering watercourses from fields**
Transport	**Eighty one per cent of the population travels to work by motor vehicle**, and twelve per cent by walking or cycling. There has been a **fall of about 5 million bus passengers** (2010/11) **since 2009/10**, and an **increase of about 2 million rail passengers in the same period**. There are conflicting statistics on transport related emissions.

Energy	Gas accounts for sixty per cent of public sector energy use. About thirty three per cent of domestic energy use is for heating and about thirty three per cent for lighting/installations. A **target** has been set by Welsh Government to **reduce average per person carbon emissions by thirty three per cent by 2020**.
Agriculture	**Farming introduces sixty per cent of the nitrates, twenty five per cent of the phosphorus and seventy five per cent of sediments to the nation's waters**[183,184]. Livestock bank **poaching has a significant impact on water quality**, increases erosion and impacts on aquatic ecosystems. Also increases risk of farm to farm diseases, and of downstream flooding and sedimentation. **Inadequate slurry storage can increase diffuse pollution** and damage the quality of water, driving up remediation costs. **Emissions from livestock** contribute to increases in GHG levels.
Forestry and woodland management	About **fifty five per cent of all woodland is coniferous plantation**, mainly owned by Welsh Government. There is a **significant amount of unmanaged woodland**, which has potential biodiversity values, but is currently fragmented. There will be a significant demand for imported biomass fuel and also for good quality building timber. There are opportunities to create woodland corridors. Recent outbreaks of **diseases present a serious threat to the forest estate**, but may also offer opportunities in terms

[183] Welsh Government (2011) Consultation on the compulsory Good Agricultural Environmental Condition to introduce buffer zones alongside water courses to tackle water pollution from agriculture

[184] Environment Agency Wales (2012) Living Waters for Wales – communicating our approach

	of rethinking and optimising ecosystem services in areas formerly planted with single species conifers.
Rural based tourism	**Unplanned tourism** can result in **negative impacts on sensitive sites**. There is a need to develop new and appropriate forms that reflect the character and quality of destinations.
Ecological footprint	**Rural Wales has a higher than average ecological footprint**, although this has been reducing largely as a result of the economic downturn. As the economy becomes more buoyant it is possible that Wales' ecological footprint will rise.

4 THE RURAL DEVELOPMENT PLAN

4.1 Introduction

4.1.1 The European Agricultural Fund for Rural Development (EAFRD) does not define the term 'rural', but requires the Managing Authority (in this case the Welsh Government) to define 'rural area' at programme level[185]. In terms of the Organisation for Economic Development (OECD) definition, which classifies local areas as 'rural' where their population density is below 150 inhabitants/km^2, the whole of Wales can be termed rural with the exception of the major population centres of Cardiff, Newport and Swansea. This is supported by work undertaken by the Office of National Statistics[186] (ONS) and means that with the exception of certain densely populated areas as shown in Map1 (see Appendix 1), Wales is predominantly rural in nature However, for the purposes of Measures 7 (Basic Services and Village Renewal) and 19 (LEADER), the Welsh Government uses a narrower definition to provide a more focused eligibility target, as discussed on the Operational Programme.

4.1.2 The term ‘Rural Wales’ is thus defined as the nine predominantly rural unitary authorities (Isle of Anglesey, Gwynedd, Conwy, Denbighshire, Ceredigion, Pembrokeshire, Carmarthenshire, Powys and Monmouthshire). Despite the undoubted rural character of parts of their areas, Flintshire and the Vale of Glamorgan are not 'rural' in terms of this definition.

4.1.3 In setting out its vision for the new RDP, the Welsh Government seeks to ensure that agriculture is able to maintain food production capacity and food security, whilst safeguarding and enhancing natural resources, in order to promote resilient and sustainable rural economies and communities[187]. Whilst sustainability is the overarching principle of the RDP, the rural economy is central to the future viability of the area and its people. The Government asserts that diversity is a key to ensuring resilience in farming, forestry and food production[188].

[185] Regulation 1305/2013 of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) article 50 'Rural area definition'. 20/12/2013

[186] Rural/Urban definition England and Wales. http://www.ons.gov.uk/ons/guide-method/geography/products/area-classifications/rural-urban-definition-and-la/rural-urban-definition--england-and-wales-/index.html (accessed 03/03/2013)

[187] RDP consultation Final Proposals February 2014. p5

[188] *ibid.*

4.1.4 In order to address the issue of a declining direct payment under Pillar I, and to optimise targeted support, it has been decided to vire the full fifteen per cent permissible under the regulation across to the RDP.

4.1.5 The Welsh Government recognises the key role played by agriculture and forestry in producing public goods, such as landscape, biodiversity, climate stability and resilience to natural disasters such as erosion and flooding[189]. These are often referred to as 'ecosystem services' and have in the past not been recognised sufficiently in economic terms. Conversely, the Government also acknowledges the potential of farming practices to deplete soils, to pollute water and to reduce biodiversity. Recognising the contribution that farming and forestry can make towards the sustainable management of natural resources, the RDP will aim to lift both economic and environmental performance.

4.1.6 Although the RDP applies to the funding of eligible proposals in the rural area, the effects of the plan will be felt in areas not defined as rural, such as the South Wales Valleys, urbanised coastal areas and settlements with significant rural hinterlands. The principle of sustainability should therefore consider not only the three interlinking spheres but also interlinking spaces. This is an important aspect of the ecosystem approach, and is an area of interest in this assessment.

4.2 Purpose of the RDP - Regulation 1305/2013

4.2.1 In order to grasp the structure of the RDP, it is important to understand its context in terms of the EU provisions within the Common Agricultural Policy (CAP). The RDP comes under Pillar II of the CAP. It is subject to its own regulation[190], and will operate under common funding rules operating under a Common Strategic Framework (CSF). The CSF is transposed into national Partnership Contracts. The RDP is designed to complement the provisions of Pillar I of the CAP, as well as those of the other funds operating under the CSF(see Figure 2)[191]. The intention is to

[189] RDP consultation Final Proposals February 2014. p7

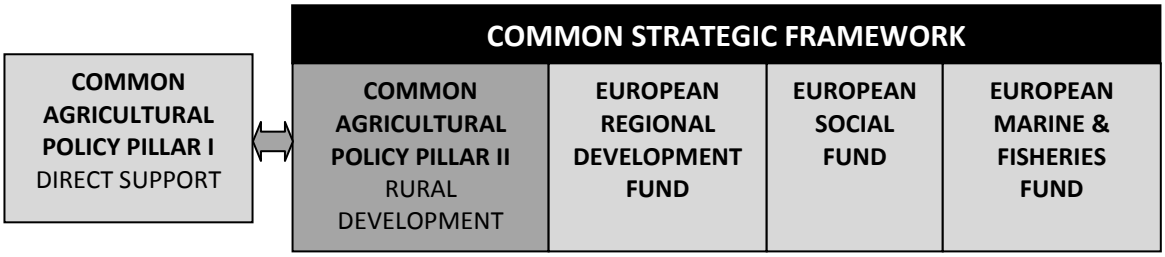
[190] Regulation 1305/2013 of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD). EU 20/12/2013

[191] The regulatory 'suite' comprises Regulation 1307/2013 (direct payments); Regulation 1308/2013 (organisation of markets), Regulation 1305/2013 (rural development); Regulation 1306/2013 (financing); Regulation 1293/2013 (environment and climate action (LIFE)) and Regulation 1310/2013 (transitional provisions)

ensure harmonisation of funds, to promote administrative efficiency and to minimise the likelihood of double-funding.

4.2.2 The EAFRD's objectives are to foster the competitiveness of agriculture; to ensure the sustainable management of natural resources and climate action; to achieve a balanced territorial development of rural economies and communities[192].

Figure 2 : Relationship between pillars I and II within the CSF



4.2.3 These three broad objectives reflect both Pillar I and II of the CAP, and in addressing them the EU is seeking to enhance competitiveness, to improve sustainability, and to seek enhanced effectiveness.

4.2.4 Within these objectives the EAFRD identifies six priority areas, namely:

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 and the sustainable management of forests;
3. Promoting food chain organisation, including processing and marketing of agricultural products, 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, forestry and food sectors;

[192] Regulation 1305/2013 of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) Article 4. EU 20/12/2013.

6. promoting social inclusion, poverty reduction and economic development in rural areas[193].

4.2.5 These priorities have been disaggregated within the EAFRD regulation into eighteen focus areas, as listed in table 8.

4.2.6 Environment, Climate Change Mitigation and Innovation are cross-cutting Objectives across all the funds within the CSF (ERDF, ESF, EAFRD and EFF), which require all the funds to work in a complementary fashion to address them.

4.2.7 In order to address these priorities and focus areas, various articles in Regulation 1305/2013 describe a set of measures for which support will be provided[194]:

4.3 Proposed Interventions

4.3.1 The Wales 2014-2020 RDP proposes eleven measures (M01-M019) in support of these six priorities and focus areas, and has set for itself the following objectives:

- To increase the productivity, diversity and efficiency of farming and forestry businesses, improving their competitiveness and resilience, reducing their reliance on subsidies
- To improve the environment, encouraging sustainable land practices, the sustainable management of our natural resources and climate action
- To promote strong, sustainable rural economic growth and encourage community-led local development

4.3.2 As well as reflecting the framework prescribed by the regulations, the RDP is also intended to achieve the Welsh Government's own twelve thematic priorities set out in the 'Programme for Government'[195]. Of these thematic priorities, 'Rural Communities' (chapter 10) and 'Environment and Sustainability' (chapter 11) are an obvious focus for the RDP, but

[193] *ibid.* Article 5. It is worth noting that there is no indication that these are prioritised or weighted and the assumption is that equal consideration is given to all the interventions.

[194] Regulation 1305/2013, Title III 'Rural Development Support', Chapter I 'Measures', articles 14-44.

[195] Programme for Government 2011. WG 13124
http://www.wales.gov.uk/programmeforgovernment

there is a clear potential to deliver also on 'Growth and Sustainable Jobs' (chapter 1); 'Supporting People' (chapter 5); 'Tackling Poverty' (chapter 9); and on 'The Culture and Heritage of Wales' (chapter 12).

4.3.2 The measures are also based on a set of twenty five identified needs as highlighted in the draft Operational Programme, and demonstrate a set of 'best fits' in terms of these needs.

Table 8: Priority and Focus Areas and Key Measures

PRIORITY AREA	FOCUS AREA	MEASURE
1 Fostering knowledge transfer and innovation in agriculture, forestry and rural areas	1a. Fostering innovation, cooperation, and the development of the knowledge base in rural areas	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M16 - Co-operation*
	1b. Strengthening the links between agriculture, food production and forestry and research and innovation, including for the purpose of improved environmental management and performance	*M16 - Co-operation*
	1c. Fostering lifelong learning and vocational training in the agricultural and forestry sectors	*M01 - Knowledge transfer and information action*
2 Enhancing farm viability and competitiveness of all types of agriculture in all regions and promoting innovative farm	2a. Improving the economic performance of all farms and facilitating farm restructuring and modernisation, notably with a view to increasing	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services*

technologies and the sustainable management of forests	market participation and orientation as well as agricultural diversification	*M04 - Investments in physical assets* *M16 - Co-operation*
	2b. Facilitating the entry of adequately skilled farmers into the agricultural sector and, in particular, generational renewal	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M06 - Farm and business development* *M16 - Co-operation*

3 Promoting food chain organisation, including processing and marketing of agricultural products, animal welfare and risk management in agriculture	3a. Improving competitiveness of primary producers by better integrating them into the agri-food chain through quality schemes, adding value to agricultural products, promotion in local markets and short supply circuits, producer groups and inter-branch organisations	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M04 - Investments in physical assets* *M16 - Co-operation*
	3b. Supporting farm risk prevention and management	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M16 - Co-operation*

4 Restoring, preserving and enhancing ecosystems related to	4a. Restoring, preserving and enhancing biodiversity, including in Natura 2000 areas and in	*M01 - Knowledge transfer and information action* *M02 - Advisory services,*

agriculture and forestry	areas facing natural or other specific constraints, and high nature value farming, as well as the state of European landscapes	*farm management and farm relief services* *M04 - Investments in physical assets* *M08 - Investments in forest area development and improvement of the viability of forests* *M10 - Agri-environment-climate* *M11 - Organic farming* *M15 - Forest environmental and climate services and forest conservation* *M16 - Co-operation*
	4b. Improving water management, including fertiliser and pesticide management	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M04 - Investments in physical assets* *M08 - Investments in forest area development and improvement of the viability of forests* *M10 - Agri-environment-climate* *M11 - Organic farming* *M15 - Forest environmental and climate services and forest conservation*

		M16 - Co-operation
	4c. Preventing soil erosion and improving soil management	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M04 - Investments in physical assets* *M08 - Investments in forest area development and improvement of the viability of forests* *M10 - Agri-environment-climate* *M11 - Organic farming* *M15 - Forest environmental and climate services and forest conservation* *M16 - Co-operation*

5 Promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors	5a. Increasing efficiency in water use by agriculture	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M04 - Investments in physical assets* *M16 - Co-operation*
	5b. Increasing efficiency in energy use in agriculture and food processing	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services*

		M04 - Investments in physical assets *M16 - Co-operation*
	5c. Facilitating the supply and use of renewable sources of energy, of by-products, wastes, residues and of other non food raw material for purposes of the bio-economy	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M04 - Investments in physical assets* *M08 - Investments in forest area development and improvement of the viability of forests* *M16 - Co-operation*
	5d. Reducing green house gas and ammonia emissions from agriculture	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M04 - Investments in physical assets* *M16 - Co-operation*
	5e. Fostering carbon conservation and sequestration in agriculture and forestry	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M04 - Investments in physical assets* *M08 - Investments in forest area development and improvement of the viability of forests* *M16 - Co-operation*

6 Promoting social inclusion, poverty reduction and economic development in rural areas	6a. Facilitating diversification, creation and development of small enterprises, as well as job creation	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M06 - Farm and business development* *M08 - Investments in forest area development and improvement of the viability of forests* *M16 - Co-operation*
	6b. Fostering local development in rural areas	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M07 - Basic services and village renewal in rural areas* *M16 - Co-operation* *M19 - Support for LEADER*
	6c. Enhancing accessibility , use and quality of information and communication technologies (ICT) in rural areas	*M01 - Knowledge transfer and information action* *M02 - Advisory services, farm management and farm relief services* *M07 - Basic services and village renewal in rural areas* *M16 - Co-operation*

4.4 Summary description of the proposals

4.4.1 M01 - Knowledge transfer and information action

This measure will be relevant to all six priorities. Activities shall focus on creating a more sustainable and competitive rural economy, through an emphasis on green growth, building resilience, increasing resource efficiency and tackling poverty across the rural economy. KTI actions need to be targeted at those businesses and persons engaged in the agricultural, food & forestry sectors to promote the economic growth and development of rural areas and to improve the sustainability, competitiveness, resource efficiency and environmental performance of agricultural and forestry holdings.

Activities within the measure will contribute to increasing the links between agriculture, food industry, forestry and research through ensuring timely transfer of knowledge and research results to the ground and facilitating two way communication of needs to and from the research community.

The programme will promote the use of ICT in farm & forestry management to support implementation of improved management practices and to deliver step change in business behaviour. This shall include the use of tools to enable the measurement and management of physical, financial & environmental performance.

Activity will contribute directly to meeting the cross cutting objectives of innovation, climate change and the environment.

4.4.2 M02 - Advisory services, farm management and farm relief services

This measure is also relevant for all of the Rural Development priorities. A main objective will be to increase the profitability of SME businesses engaged in the agriculture, forestry and food sectors, land managers and other SME businesses operating in rural areas.

The measure contributes to priority 1 "Fostering knowledge transfer and innovation in agriculture, forestry and rural areas". It will also contribute directly to the focus areas under Priority 2 (relating to enhancing competitiveness of agriculture and enhancing farm viability, Priority 3 (promoting food chain organisation and risk management in agriculture) Priority 4 (restoring, preserving and enhancing ecosystems dependent on agriculture and forestry) Priority 5 (relating to climate change resilience and resource efficiency) and Priority 6 (promoting social inclusion and economic development in rural areas.

Specific advice on climate change mitigation and adaptation, biodiversity, the protection of water, and also agricultural practices beneficial for the climate and the environment will contribute directly to the cross-cutting objectives of climate change and the environment.

4.4.3 M04 - Investments in physical assets

This measure applies to priorities 2-5. The proposal is to develop a flexible investment scheme providing grants, loans and other finance required for agriculture/food/forestry purposes including processing and marketing, and non-agricultural diversification. The scope of investments will include agricultural buildings; processing, marketing and/or development of agricultural products; infrastructure linked to the modernisation or adaptation of agriculture or forestry; and the achievement of agri-environment-climate objectives.

Funding will target activities that result in long term benefit, supporting increased diversity and resilience in the farming and forestry industries, with a greater focus on commercial opportunities.

Capital funding will address the following themes: animal and plant health and welfare; crop storage; production housing and handling; soil and crop management. Applicants will need to address efficiencies in water, nutrients and energy. Support will also be given to on-farm self-use renewable energy proposals.

4.4.4 M06 - Farm and business development

Under this measure, which applies to priorities 2 and 6, support will be provided for the creation and development of new viable economic activities such as new farms run by young people, new businesses and new entrants as well as investments in non-agricultural activities. Eligible expenditure would include the purchase of stock, appropriate pasture rejuvenation, farm infrastructure and operating machinery and other equipment as identified in the strategic business development plan.

4.4.5 M07 - Basic services and village renewal in rural areas

This measure supports priority 6, and aims to improve the underlying economic circumstances of businesses and communities in rural Wales by promoting jobs and growth, preventing poverty and mitigating its impact. Options will include: drawing up village development plans to build resilience and sustainability and to address locally identified needs; investing in small-scale infrastructure including renewable energy;

investing in local basic services based on community-led models; investing in small-scale recreational or tourist infrastructure; investing in relocating activities for environmental/quality of life reasons; community-based rural transport; investment in ICT; studies or investments in cultural and natural heritage.

4.4.6 M08 - Investments in forest area development and improvement of the viability of forests

This measure falls within the ambit of priorities 4, 5 and 6, and includes a range of options that aim to increase the amount of woodland and to maximise its resilience and its ability to deliver a range of ecosystem services. These include: woodland creation; woodland management, including for biodiversity, water management, soil protection and carbon sequestration; woodland economy, including access provision and thinning; restoration of woodlands damaged by disease, storm or fire; monitoring and taking preventative measures; habitat restoration including peat habitats. Other provisions will include improving diversity of within stands including riparian zone management; removing invasive species; investment in amenity; modifying woodland drainage and improving water quality.

4.4.7 M10 - Agri-environment climate

This measure, in support of priority 4 aims to promote farm and farm woodland practices that will increase the quantity and quality of biodiversity, will improve the quality of water and soils, and will reinforce the character of the rural landscape. It also aims to conserve farm genetic stock and to use it sustainably, as well as to reduce greenhouse gas and ammonia emissions and optimise carbon sequestration.

A fully integrated and holistic approach of identifying areas over entire holdings and/or catchments and targeting support through tailored management practices through this Measure should provide opportunities for land managers to change their current practices in a way that will enhance the delivery of ecosystem services outputs, in addition to ensuring that they maintain and enhance the biodiversity and visual value of the land that they manage.

4.4.8 M11- Organic farming

This measure links to priority 4. It supports existing organic enterprises and aims to promote the conversion to organic farming practices. The

measure will prioritise those areas likely to deliver the best environmental outcomes for Wales.

4.4.9 M15 - Forest environmental and climate services and forest conservation

This measure is also specific to priority 4. It will include action to compensate landowners in line with requests to not replant certain woodlands in order to reduce tree canopy in order to avoid airborne pollutant scavenging and the resultant increase in acidification of waters. Similar compensatory measures will be introduced where woodland is being restored to peatland.

This measure will be introduced in 2016 if necessary in response to completed pilots and guidance.

4.4.10 M16 - Co-operation

Relevant especially to priorities 1 and 3, but contributing to all priorities, this measure sets out to support land managers and operators to achieve better outcomes through working co-operatively. Such outcomes include: increasing relevant SME profitability; improved soil management in order to conserve carbon and reduce erosion; reducing water run-off and improving water quality; managing water flow to reduce flood risks; conserve and enhance biodiversity at landscape scales; protect historic and cultural landscapes; decrease reliance on carbon-based fuels; manage woodlands in a wider context through collaborative natural resource planning.

Priority areas may include for instance: technical solutions to increasing productivity or resource efficiency, maximising sustainable use of ecosystem services, soil functionality and water management, integrated supply chain solutions, benchmarking and managerial innovation for producers, or development of new food quality and livestock health care schemes.

4.4.11 M19 - Support for LEADER local development (CLLD – community-led local development) (art 35 Regulation (EU) No 1303/2013)

This measure is specific to priority 6. It proposes a number of thematic options, including: reinforcing and adding value to local identity and cultural resources; supporting business partnerships and short supply chains; exploring novel approaches to providing non-statutory local services; community-based renewables; and exploitation of digital technology. Local action groups will be able to select more than one

thematic option in order to reflect the needs and characteristics of their area.

4.5 Funding allocations compared to 2007-2013 RDP

4.5.1 The 2007-13 RDP allocated €1,049,000,000 across four axes[196]. Converted to GBP and adjusted for inflation, the allocation would have been the equivalent to about £1,030,000,000 in today's terms.

4.5.2 It is difficult to make strict comparisons between the two sets of figures, partly because issues such as climate change adaptation and developing the ecosystem approach play a more prominent role in decision making across the interventions. The strong link between sharing knowledge, building capacity through training and investing in business appears to be reinforced in the 2014-2020 RDP.

4.5.3 The allocation towards 'environment' (priority 4) will be fifty nine per cent compared to 71.7 percent in the 2007-13 round. The assumption is that this element is aimed at *improving* the current environmental situation in rural Wales. There is no reason to assume that none of the measures specific to the other priorities will not also help to do this. It has been made clear that proposals which will further damage the environment will not be supported.

4.5.4 Given the Government's commitment to achieving greater value, it would be premature to assume that this reduction in funding will result in a reduction of delivery towards environmental quality, especially given the emphasis on delivering environmental objectives as part of cross-cutting requirements.

4.5.5 It is important to be aware that a suite of financial or other *output* indicators measurement is not in itself a measure of *outcomes.* Whilst the former frequently relates to quantity, the latter is often a measure of quality.

[196] Based on the Rural Development Plan for Wales 2007-13.

Table 9: Funding allocations compared with the 2007-2013 budget

Scope of intervention	Funding allocation in £ at 2014 prices			
	2007-2013		2014-2020	
Capacity/growth/productivity	16.1%	£165,888,090.00	11%	£104,865,475.00
Farm/forestry business			15%	£142,998,374.00
Environment	71.%	£738,173,791.00	59%	£562,460,275.00
LEADER/rural community	12.2%	£125,643,581.00	11%	£104,865,476.00
Technical assistance			4%	£38,132,898.00
TOTAL FUND	**£1,029,705,462.00**		**£953,322,498.00**	

5 ASSESSMENT OF THE RDP INTERVENTIONS

5.1 Testing the compatibility of the SEA objectives and the RDP measures

5.1.1 The purpose of this section is to analyse each measure and to consider the likelihood of environmental effects, and the significance of those effects as far as possible. Table 10 provides an overall assessment of the measures, whilst table 11 summarises the logic behind each score.

Table 10: Presentation of compatibility matrices

	Improve physical & mental health and reduce health inequalities	Protect & enhance biodiversity	Protect places, landscapes & buildings of historic, cultural & archaeological value	Protect soil quality & quantity	Protect the water resource & ensure its sustainable use	Protect & improve water quality	Protect & improve air quality	Limit & adapt to climate change	Minimise waste increase re-use, recycling & recovery rates	Minimise the need to travel; provide alternatives to car use	Maintain & enhance animal welfare standards	Optimise opportunities for rural tourism whilst minimising negative impacts
M01	O	✓	?✓	✓	✓✓	✓✓	?✓	✓✓	✓	O	✓✓	✓
M02	O	✓	O	✓	✓✓	✓✓	O✓	✓✓	✓	O	✓	✓
M04	O	?✓	?	?✓	✓	✓✓	✓	✓✓	O	O	✓✓	?
M06	O	O	O	O	O	O	O	O	O	O	O	O✓
M07	✓✓	O✓	✓	O	O✓	O✓	O	O✓	O✓	✓	O	✓
M08	O	✓✓	O✓	✓✓	✓✓	✓	✓	✓✓	O	O	O	✓
M010	O✓	✓✓	✓	✓✓	✓✓	✓✓	O✓	O✓	O	O	?✓	?✓
M011	O✓	✓	O✓	✓	O✓	✓✓	O✓	✓✓	✓	O✓	✓✓	O✓
M015	O	✓✓	O	O	✓	✓✓	O	O	O	O	O	O
M016	✓	✓✓	✓	✓	✓✓	✓✓	✓	✓✓	O✓	O	✓	✓
M019	✓✓	?✓	?✓	O	O	O	O	?✓	O✓	✓	O	O✓

Table 11: Comments on the basis for scoring

M01 Knowledge transfer and information action		
Improve physical and mental health and reduce health inequalities	O	Improving communication and advice may have a small positive effect in terms of building confidence, but probably not significant effect on physical and mental health.
Protect and enhance biodiversity	✓	Directing innovation towards environmental performance will have a positive effect: plant health, appropriate diversification, climate change and water management will be positive.
Protect places, landscapes and buildings of historic, cultural and archaeological value	?✓	Potential to protect and enhance important landscapes; cultural/historic heritage less specific.
Protect soil quality and quantity	✓	Promoting ecosystem approach to land management is likely to have a positive effect.
Protect the water resource and ensure its sustainable use	✓✓	As above. Depends on positive promotion, beyond basic mandatory requirements. Addressing WFD is a key element.
Protect and improve water quality	✓✓	As above.
Protect and improve air quality	?✓	Potential to protect air quality linked to sharing knowledge of optimal stock and farm infrastructure management.
Limit and adapt to climate change	✓✓	An important priority. Skill transfer on energy conservation, woodland, upland and wetland management etc is likely to have some positive outcomes.
Minimise waste increase re-use, recycling and recovery rates	✓	Skill sharing on waste management should be integral to farm management. Some small positive beyond the regulatory requirement.
Minimise the need to travel; provide alternatives to car/lorry use	O	Not likely to have a significant effect, though reduced chains and localising community-based services will help.
Maintain and enhance animal welfare standards	✓✓	This is a priority linked to business planning/risk analysis.
Optimise opportunities for rural tourism whilst minimising negative impacts	✓	Where relevant, farm tourism is an optional business opportunity that might be promoted alongside quality brand.

M02 Farm advisory services, farm management and farm relief services		
Improve physical and mental health and reduce health inequalities	**O**	No obvious significant effect likely, though could help build confidence where not seen as burdensome.
Protect and enhance biodiversity	✓	A number of elements in the RDP will promote biodiversity protection/ enhancement.
Protect places, landscapes and buildings of historic, cultural and archaeological value	**O**	Not likely to be significant.
Protect soil quality and quantity	✓	Habitat management, water containment, increased tree planting, will have positive effects.
Protect the water resource and ensure its sustainable use	✓✓	A key element of the proposed plan. Likely to have significant positive effect.
Protect and improve water quality	✓✓	As above.
Protect and improve air quality	**O**✓	Advice on diet and stocking systems to reduce emissions, but increased stocking rates?
Limit and adapt to climate change	✓✓	A key objective, but potential for increased stocking rates to increase emissions.
Minimise waste increase re-use, recycling and recovery rates	✓	Advice likely to focus on production efficiencies. Likely to be promoted as part of cross compliance, and relatively easily observable.
Minimise the need to travel; provide alternatives to car/lorry use	**O**	Not likely to have a significant effect.
Maintain and enhance animal welfare standards	✓	Animal welfare likely to be a focus of advice and support. Depends on the productivity balance & potential for intensive systems in some areas.
Optimise opportunities for rural tourism whilst minimising negative impacts	✓	Tourism has potential to be significant. Depends on extent of the supporting measures.

M04 Investments in physical assets		
Improve physical and mental health and reduce health inequalities	O	Not likely to have a significant effect.
Protect and enhance biodiversity	?✓	The focus is on farm efficiency and economic performance. Some minor benefits from e.g. invasive eradication. Will need other measures to support farm birds. Agri-environment measures will be positive.
Protect places, landscapes and buildings of historic, cultural and archaeological value	?	There may be some local landscape impacts, and impacts on important vernacular buildings. Will require careful design considerations.
Protect soil quality and quantity	?✓	Likely to have a positive effect depending on the nature of animal/plant health measures. Efficiencies in water management likely to reduce erosion. Soil management is an element of the measure.
Protect the water resource and ensure its sustainable use	✓	Efficiencies in water use are specific to this measure. Capital investment may include water storage facilities as well as measures to reduce water loss through leakages.
Protect and improve water quality	✓✓	Measures to reduce nutrients and to manage soils are likely to have a string positive effect on water quality.
Protect and improve air quality	✓	Potential to reduce/capture ammonia and methane emissions.
Limit and adapt to climate change	✓✓	Potential to reduce/capture ammonia and methane emissions. Ammonia is linked to nitrous oxide, a greenhouse gas. Renewables element will contribute.
Minimise waste increase re-use, recycling and recovery rates	O	Not likely to have a significant effect.
Minimise the need to travel; provide alternatives to car/lorry use	O	Not likely to have a significant effect.
Maintain and enhance animal welfare standards	✓✓	This is an explicit aspect of this measure.
Optimise opportunities for rural tourism whilst minimising negative impacts	?	On its own this measure does not target the tourist market, but may promote non-farm activities that will enhance landscape.

M06 Farm and business development		
Improve physical and mental health and reduce health inequalities	**O**	Might benefit socially isolated young farmers, build confidence.
Protect and enhance biodiversity	**O**	Would not necessarily promote this objective without parallel measures such as advice, training and funding.
Protect places, landscapes and buildings of historic, cultural and archaeological	**O**	As above.
Protect soil quality and quantity	**O**	As above.
Protect the water resource and ensure its sustainable use	**O**	As above.
Protect and improve water quality	**O**	As above.
Protect and improve air quality	**O**	As above.
Limit and adapt to climate change	**O**	As above.
Minimise waste increase re-use, recycling and recovery rates	**O**	As above.
Minimise the need to travel; provide alternatives to car/lorry use	**O**	No obvious significant effect.
Maintain and enhance animal welfare standards	**O**	Would not necessarily promote this objective without parallel measures such as advice, training and funding. Legal requirements as minimum.
Optimise opportunities for rural tourism whilst minimising negative impacts	**O✓**	Potential slight effect from diversification - new entrants likely to be receptive to diversification and new opportunities - less risk averse?

M07 Basic services and village renewal in rural areas		
Improve physical and mental health and reduce health inequalities	✓✓	Access to services. Local enterprise will develop skills. Opportunities to volunteer for community projects. Job opportunities.
Protect and enhance biodiversity	O✓	Some potential for positive local effects from community biodiversity initiatives.
Protect places, landscapes and buildings of historic, cultural and archaeological value	✓	Potential to reinforce local distinctiveness and maintain sense of place and cohesion. Re-using redundant buildings will maintain their fabric. Opportunity for communities to market places of heritage interest.
Protect soil quality and quantity	O	No obvious significant effect. Re-using redundant buildings/brown field land will reduce need for green field development.
Protect the water resource and ensure its sustainable use	O✓	Community/public buildings should ensure high quality water management systems.
Protect and improve water quality	O✓	Community/public buildings should ensure SUDS as part of improvement schemes.
Protect and improve air quality	O	No obvious significant effect.
Limit and adapt to climate change	O✓	Community/public buildings should ensure use of renewables, energy efficiency and sustainable buildings. Link to ERDF?
Minimise waste increase re-use, recycling and recovery rates	O✓	Community/public enterprises should ensure water and waste recycling.
Minimise the need to travel; provide alternatives to car/lorry use	✓	Improving access to services locally will reduce the need to travel. Community transport could reduce the need to use cars?
Maintain and enhance animal welfare standards	O	No obvious significant effect.
Optimise opportunities for rural tourism whilst minimising negative impacts	✓	Community based enterprises such as shops, crafts, refreshments, accommodation could contribute significantly. Access to doctors, dentists etc important.

M08 Investments in forest area development and improvement in the viability of forests		
Improve physical and mental health and reduce health inequalities	O	No obvious significant effect.
Protect and enhance biodiversity	✓✓	Measures prioritise N2K woodland associated sites. Potential to develop buffers/ corridors. Improved habitat.
Protect places, landscapes and buildings of historic, cultural and archaeological value	O✓	Measures to enhance woodland quality and appropriate planting will reinforce landscape character. Need to protect archaeological sites.
Protect soil quality and quantity	✓✓	An explicit aspect of the measure is to protect soil quality and minimise erosion risk.
Protect the water resource and ensure its sustainable use	✓✓	A key element of the measure is to optimise the management of water to reduce flood risk.
Protect and improve water quality	✓	The measure aims to ensure water quality by reducing erosion/nutrients - need for other measures (see M015) to reduce acidification of water courses.
Protect and improve air quality	✓	Air quality likely to be maintained/improved as a result of the measures.
Limit and adapt to climate change	✓✓	Carbon sequestration is a key objective of the measure, by increasing the amount of woodland in intermediate agricultural land - needs careful consideration/woodland management plans/EIA as appropriate.
Minimise waste increase re-use, recycling and recovery rates	O	No likely significant effects.
Minimise the need to travel; provide alternatives to car/lorry use	O	No likely significant effects.
Maintain and enhance animal welfare standards	O	No likely significant effects.
Optimise opportunities for rural tourism whilst minimising negative impacts	✓	Likely to result in attractive accessible woodlands.

M010 Agri-environment climate		
Improve physical and mental health and reduce health inequalities	O✓	Not likely to be significant, but moves towards co-operative working may build confidence.
Protect and enhance biodiversity	✓✓	Farm habitat networks, woodland & upland resilience schemes & targeted delivery of ecosystem services is likely to be positive.
Protect places, landscapes and buildings of historic, cultural and archaeological value	✓	Glastir should help to reinforce landscape character including historic & cultural values.
Protect soil quality and quantity	✓✓	Significant benefit to soil conservation from interventions to promote ecosystem services.
Protect the water resource and ensure its sustainable use	✓✓	Significant positive likely, especially from upland schemes & proposed farm habitat networks
Protect and improve water quality	✓✓	As above.
Protect and improve air quality	O✓	Under organics regime, management of fertilisers (including animal wastes) and pesticides could improve local air quality.
Limit and adapt to climate change	O✓	Enhancement of moorland and upland resilience will contribute. Could be significant over time.
Minimise waste increase re-use, recycling and recovery rates	O	No obvious significant effect.
Minimise the need to travel; provide alternatives to car/lorry use	O	No obvious significant effect.
Maintain and enhance animal welfare standards	?✓	Improved soil condition and a reduction in chemicals could have a positive effect on animal welfare.
Optimise opportunities for rural tourism whilst minimising negative impacts	?✓	General condition of the rural environment is a factor on people's willingness to visit. A less industrialised rural landscape is more attractive.

M011 Organic farming		
Improve physical and mental health and reduce health inequalities	O✓	Not likely to be significant. Satisfaction factor?
Protect and enhance biodiversity	✓	Strong evidence of benefit, but depends on the type of organic regime.
Protect places, landscapes and buildings of historic, cultural and archaeological value	O✓	Potential to reinforce landscape character and to protect traditional farm infrastructure, e.g walls, hedges, barns etc.
Protect soil quality and quantity	✓	Organic farming aims to use natural systems to fertilise soils and to maintain their structure. There is string evidence of positive effects.
Protect the water resource and ensure its sustainable use	O✓	Where mulching is used extensively, this may help to conserve water on land. Mixed systems and rotation will reduce run-off.
Protect and improve water quality	✓✓	Removal of artificial fertilisers and pesticides will reduce diffuse pollution of water courses.
Protect and improve air quality	O✓	Locally, air quality may improve as a result of a reduction in industrial land management, depending on the scale and type of enterprise.
Limit and adapt to climate change	✓✓	The removal of industrial processes, including the production, transportation and dispersal of chemical fertilisers and pesticides will have a significant effect.
Minimise waste increase re-use, recycling and recovery rates	✓	A key element of organic farming is the recycling of crop and animals wastes.
Minimise the need to travel; provide alternatives to car/lorry use	O✓	Reductions in transportation of fertilisers/ pesticides?
Maintain and enhance animal welfare standards	✓✓	Animal welfare is a central element of organic farming - feeding, living conditions.
Optimise opportunities for rural tourism whilst minimising negative impacts	O✓	Organic farming provides an attractive marketing brand that is popular with some tourists. Supports the promotion of places as tourism destinations.

M015 Forest environmental and climate services and forest conservation		
Improve physical and mental health and reduce health inequalities	**O**	No obvious significant effect.
Protect and enhance biodiversity	✓✓	Measures will aim to maximise environmental value including biodiversity in cleared sites. Subject to appropriate plan. May need appropriate assessment.
Protect places, landscapes and buildings of historic, cultural and archaeological value	**O**	No obvious significant effect.
Protect soil quality and quantity	**O**	Does not explicitly address this - potential for temporary damage to soil as a result of woodland clearance operations?
Protect the water resource and ensure its sustainable use	✓	A key element of the measure is to optimise the management of water to reduce flood risk by extending peatland where viable.
Protect and improve water quality	✓✓	The measure aims to ensure water quality by reducing the scavenging of pollutants by woodlands.
Protect and improve air quality	**O**	No likely significant effects.
Limit and adapt to climate change	**O**	No likely significant effects.
Minimise waste increase re-use, recycling and recovery rates	**O**	No likely significant effects.
Minimise the need to travel; provide alternatives to car/lorry use	**O**	No likely significant effects.
Maintain and enhance animal welfare standards	**O**	No likely significant effects.
Optimise opportunities for rural tourism whilst minimising negative impacts	**O**	No likely significant effects.

M016 Co-operation		
Improve physical and mental health and reduce health inequalities	✓	Should provide some opportunities for improving skills and confidence, and reducing isolation, depending on levels of funding.
Protect and enhance biodiversity	✓✓	The potential to deliver ecosystem services will be enhanced where this is done collaboratively.
Protect places, landscapes and buildings of historic, cultural and archaeological value	✓	As above.
Protect soil quality and quantity	✓	As above.
Protect the water resource and ensure its sustainable use	✓✓	Co-operative approaches are critical to addressing this objective. Significant potential positive.
Protect and improve water quality	✓✓	As above.
Protect and improve air quality	✓	Potential for significant positive local effects where promoted in adjoining farm systems.
Limit and adapt to climate change	✓✓	Significant increase potential to address climate change where interventions are carried out co-operatively.
Minimise waste increase re-use, recycling and recovery rates	O✓	Co-operative approach to waste management will increase efficiency and should reduce costs.
Minimise the need to travel; provide alternatives to car/lorry use	O	May have a local effect, but not significant.
Maintain and enhance animal welfare standards	✓	Animal welfare minimum standards are regulated. A key element.
Optimise opportunities for rural tourism whilst minimising negative impacts	✓	Potential to promote farm-based tourism. Potential to exploit enhanced biodiversity and landscape.

M019 Support for LEADER local development (CLLD - Community-led local development		
Improve physical and mental health and reduce health inequalities	✓✓	LEADER's purpose is to support community resilience. The option to provide non-statutory local services would be positive.
Protect and enhance biodiversity	?✓	Potential, but depends on choice of option.
Protect places, landscapes and buildings of historic, cultural and archaeological value	?✓	Potential for local visual impact from terrestrial wind turbines. Potential for landscape enhancement through planting for biomass, biodiversity etc. Potential to promote cultural distinctiveness/historic values.
Protect soil quality and quantity	O	No obvious significant effect.
Protect the water resource and ensure its sustainable use	O	No obvious significant effect.
Protect and improve water quality	O	No obvious significant effect.
Protect and improve air quality	O	No obvious significant effect.
Limit and adapt to climate change	?✓	Depends on the options chosen by the LAG. Option to promote renewables will contribute, as will energy efficient developments.
Minimise waste increase re-use, recycling and recovery rates	O✓	Potential small benefit linked to standards for project management/developments.
Minimise the need to travel; provide alternatives to car/lorry use	✓	Provision of local non-statutory services could have a significant positive effect locally, as could short supply chains & access to ICT.
Maintain and enhance animal welfare standards	O	No obvious significant effect.
Optimise opportunities for rural tourism whilst minimising negative impacts	O✓	Local opportunities likely to arise from adding value to local identity & natural/cultural resources.

5.2 Comparing this SEA with the 2013 draft SEA

5.2.1 The March 2013 assessment indicated some reservations, stating that *'there are more question marks than would be the case if there was a set of objectives and if the interventions were more specific. A key issue is whether the advice and support provided, and the training and restructuring are prioritised towards soil, air, water and biodiversity conservation beyond cross compliance, alongside the development of skills, or whether they are prioritised towards land improvement and productivity.'*

5.2.2 These concerns have been largely addressed. There now appear to be no likely significant negative effects, compared to the eight identified in the previous assessment. This still depends on ensuring that the measures are rigorously applied to ensure cross compliance, that the funding is targeted to optimise environmental benefit whilst addressing other priorities, and that activities are regularly monitored to ensure compliance with environmental standards.

6 ALTERNATIVES

6.1 Selection and discussion of alternatives to the proposed programme

6.1.1 In discussing alternatives, it might be possible in theory to consider a variety of high level policy scenarios, such as an 'economic growth first' scenario or, say, an 'environment first' or a 'food security first' scenario, as is common in many policy forecasting studies, but that would be inappropriate, since the EU and the Welsh Government have both indicated that the scenario they seek is a 'sustainable development' scenario in which social, environmental and economic priorities are balanced as a matter of principle. There is thus no definitive 'first', since it is not the intention to seek 'trade-offs' at a policy level.

6.1.2 The SEA Directive requires a discussion of reasonable alternatives to the proposed Programme, and why they are not considered to be an improvement in environmental terms. The Directive does not specify what is 'reasonable' but does state (in paragraph 5.12) that a discussion of alternatives should include *'...the likely evolution of the current state of the environment without the implementation of the alternative'.* The Directive doesnot specify whether 'alternatives' means alternative programmes, or different alternatives *within* the proposed programme.

6.1.2 The Wales SEA Regulations state that the environmental report must identify, describe and evaluate the likely significant effects of implementing the plan and reasonable alternatives, taking into account the objectives and the geographical scope of the plan[197]. In the case of the RDP, the key objectives referred to are those described in the EAFRD Regulation, within the framework of the CAP, based on three headline objectives and nine sub-objectives, namely:

(1) viable food production

- to contribute to farm incomes
- to improve competitiveness
- to compensate for production difficulties in areas with specific natural constraints

[197] section 12 (2)

(2) the sustainable management of natural resources, and climate action

- to guarantee sustainable production practices and secure the enhanced provision of environmental public goods
- to foster green growth through innovation
- to pursue climate change mitigation and adaptation actions

(3) a balanced territorial development of rural areas

- to support rural employment and maintaining the social fabric of rural areas
- to improve the rural economy and promote diversification
- to allow for structural diversity in the farming systems, improve the conditions for small farms and develop local markets[198]

6.1.2 The purpose of analysing alternatives is to determine whether the proposals offer the optimal option in terms of *'the likely evolution of the current state of the environment*' in the context of sustainable development[199]. Although it is beyond such an analysis to consider the economic or social dimensions in detail, the reality is that these dimensions have a significant influence on the state of the environment, because its condition relies on the support of economically and socially viable communities.

6.1.3 Any discussion of alternatives must therefore be based on what is reasonable, and must take into account the objectives of the plan.

6.1.4 The EAFRD contains a number of constraints and a degree of flexibility. It would not be reasonable to select and discuss

[198] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the Regions. The CAP Towards 2020 Meeting the food, natural resources and territorial challenges of the future page 7

[199] The EU's position on sustainable development is presented in its 2009 review of the EU Sustainable Development Strategy, which makes the following points: "A number of unsustainable trends require urgent action. Significant additional efforts are needed to curb and adapt to climate change, to decrease high energy consumption in the transport sector and to reverse the current loss of biodiversity and natural resources... It is crucial that measures to support the real economy and reduce the social impact of the current crisis are compatible with long-term sustainability goals."

alternatives that will be illegal or cannot be implemented within the constraints set by the EAFRD.

6.1.5 Other factors include:

- Time - the plan is subject to a seven year timescale. Recommending alternatives that require interventions after this period would not be reasonable, nor realistic since it would not be possible to predict the situation beyond 2020.

- Funding - this has yet to be finalised and allocated. Although negotiations have yet to be completed, the indications at the time of this report are that the budget has been set. It would therefore not be reasonable to discuss alternatives in terms of any likely increase in funding.

- Deployment of funds - there is a degree of flexibility, currently allowing a small percentage of shift of direct payments from Pillar I to Pillar II to allow for a reinforcement of rural policy[200]. A minimum allocation of five per cent of the total EAFRD contribution has been proposed for the LEADER programme, implying that funding could be increased[201].

- Policy - it would not be reasonable to consider alternatives that are not consistent with EU, UK and Wales policies.

6.1.16 This discussion considers the effects of focusing interventions in different ways.

6.1.17 **Option 1 - productivity:** focus on building capacity to compete on market share might emphasise marketing, productivity, efficiency, food security, animal welfare alongside support to enterprises by way of advice and training. This might shift production towards the most productive, cost efficient areas.

6.1.18 **Option 2 - social capacity:** focus on promoting social cohesion, promoting services and public transport, with an emphasis on community based enterprises and access to ICT. Interventions would be targeted thematically and spatially to ensure maximum effectiveness and efficiency in terms of accessing facilities and

[200] EU Regulation 1307/2013. 17 December 2013. Article 14

[201] EU Regulation 1305/2013. 17 December 2013. Article 59(5)

opportunities for training. This option might target local supply chains in line with option 1.

6.1.19 **Option 3 - environmental resilience:** focus on optimising opportunities for environmental benefit, subject to alternative environmental priorities. **Option 3a** would seek to support the climate change agenda as much as possible within available funds, entailing support for carbon soil management; for addressing farm based emissions through bio-digestion; promoting appropriate habitat (woodland, scrub, semi-natural grassland) restoration and management for sequestration; promoting public transport, alternatives to long-distance haulage, reducing production to consumption chains. **Option 3b** would seek to gain maximum benefits for biodiversity and for ecology, by promoting co-operative approaches to managing land at a 'landscape scale' e.g. commons, watercourses, catchments; by supporting alternative land uses and management to develop buffer zones, corridors, hedgerow, scrub and woodland planting, setting aside land, winter feeding crops; bankside management; pesticide, herbicide and fertiliser management.

6.1.20 Whilst none of these is exclusive, different focuses entail different funding strategies. Some elements will require significant financial support, e.g. training costs and farm improvement schemes in option 1, local transport and infrastructure or set-up costs in option 2, interventions such as anaerobic digestion and transport in option 3a, which would inevitably divert funds away from other interventions.

6.1.21 The effect of focusing too strongly on **option 1** might be over intensification in productive areas, with impacts on already fragmented adjacent conservation sites. There could be a reluctance to use buffer zones or build ecological corridors on productive land. The selection of productive grasses may increase soil compaction and reduce water and soil carbon, potentially increasing carbon and methane emissions, and the use of herbicides will reduce plant, bird and invertebrate diversity. Climate factors may exacerbate the likelihood of flooding events on land that has been drained and which offers few buffers and water containment measures. Conversely, such land is likely to be more susceptible to drought conditions, with impacts on crop and stock resilience. Diverting funds towards productivity will also have a negative impact on marginal areas which will not

be able to sustain agri-environment systems in ways to sufficiently address biodiversity losses.

6.1.22 The effect of overemphasising **option 2** might be a commitment of funds to social and community programmes that might be met from other resources, or that might be incapable of being sustained without continuing funding support. This may divert funds from important and ultimately self-sustaining environmental projects that might in the future be able to support social programmes through income generation. Some social and community programmes might focus on enhancing ecosystem services through the development of collaborative initiatives. The promotion of access to high speed ICT may reduce the need to travel, but this may not affect significant numbers of people to impact on car use.

6.1.23 Whilst options 3a and 3b are seen as complementary, it is likely that **option 3a** is more costly, since it will require support to develop a considerable number of anaerobic digesters, farm-scale renewables, and supporting public transport and local product delivery systems through re-establishing more local-level abattoirs for example. Whilst **option 3b** may be less costly in terms of 'hard' interventions such as those in option 3a, there will be costs in terms of training, developing collaborative management systems, monitoring and regulating, as well as the costs of appropriate plant for land management. The benefit of focusing on ecosystem and biodiversity protection and enhancement is the development of a resilient environment that will be responsive to climate change, and will offer economic opportunities in the future, providing that appropriate value systems for ecosystem services are established. On the other hand, there is a danger of over-regulation and community resentment that cannot be sustained. In some cases there may be a loss of production systems that benefit some species over others.

6.1.24 Any plan or project should seek to optimise benefits across environmental, economic and social interests, and minimise disbenefits. For this reason, the options discussed above are not exclusive. However, it is critical that environmental limits are respected, and wherever possible made more robust, and therefore **the funding emphasis in Pillar II is rightly on the agri-**

environmental aspect. It is indicated that fifty nine per cent of the funding will be directed towards this[202].

6.1.24 It is not clear whether a 'do nothing' option means 'continue the current programme' or 'have no programme at all'. In the first case, the question is whether the current programme is a preferred option to the proposed one. The current programme was designed under different circumstances. The economy had not taken a downturn, and the likely failure to halt and reverse biodiversity loss by 2010 was perhaps less apparent at the time. Climate change was a major concern, but the Welsh Government had yet to clarify its position fully on its priorities. Certain directives on water, climate and waste had not been fully implemented, and fuel costs were not as high as they are at present. The proposed programme is based on addressing these concerns[203]. By removing the axes and by allowing for complementary approaches with Structural Funds, the proposals aim to promote flexible approaches that reflect the needs of the regions.

6.1.26 Glastir's different elements were progressing at different rates by June 2012, with demand described as “mixed” with some elements such as the Common Land element experiencing good, and sometimes very good, demand with other elements such as the All Wales Element having not yet achieved the objectives of the scheme by that time, for various reasons such as design and communication[204].

6.1.27 If 'do nothing' literally implies the withdrawal of any rural development programme, the obvious implication is that there will be insufficient funds to address environmental priorities, including the need to protect sites of European conservation interest. The environmental implications might include (not exhaustive):

- loss of small extensive units and abandonment of some important upland areas;

[202] Common Agricultural Policy Reform: Wales Rural Development Programme 2014-2020 Final Proposals. Consultation Document. Welsh Government February 2014. WG20644. p18

[203] 'Against the background of the economic crisis and the pressure on public finances, to which the EU has responded with the Europe 2020 strategy and the MFF proposal' - EARDF Regulation proposal. p4

[204] Glastir Stocktake June 2012. Report of findings.

- intensification of potentially productive areas in the lowlands, with a loss of fragmented adjacent habitats, resulting in species losses, and CO_2 releases;
- degradation of peat and organic soils with increased CO_2 emissions;
- increases in chemical use with resultant impacts on water bodies;
- reduced ability to manage risk in relation to animal welfare and disease;
- loss of potential for woodland creation and restoration, resulting in a lost opportunity to sequester carbon, manage water and provide a natural resource;
- loss of support to key rural services, with the likelihood of a spiral of social decline, the abandonment of property to second homes, the loss of vibrant culture, and increases in car use;
- lack of capacity to protect, restore and enhance important heritage sites and vernacular buildings

6.1.28 None of the above takes into account external factors such as global food markets, retail sector attitudes, policy on, for example, the environmental costs of transportation, support to production, other consumer costs affecting their choice of product or climate change. Furthermore, natural systems are neither stable nor static. Key future considerations include the need to:

- ensure resilience by protecting and enhancing the environmental resource;
- ensure that messages are clear and that there are sufficient resources to monitor and to enforce high environmental standards;
- allow for some flexibility to be able to respond to changes in economic and environmental circumstances.

6.1.29 In conclusion, the proposed interventions aim to address a range of circumstances not envisaged in 2006, and therefore it is anticipated that they will be more 'fit for purpose' than, say, a continuation of

the 2007-2013 programme without change. The proposed plan appears to offer an optimal combination of measures.

7 ASSESSMENT OF THE PROPOSED PROGRAMME

7.1 Summary of findings

7.1.1 The overarching aim of the RDP for 2014-2020 is *"...to support the rural economy, and in particular agriculture...to be sustainable in the long term*[205]*."*

The objectives are:

- To increase the productivity, diversity and efficiency of farming and forestry businesses, improving their competitiveness and resilience, reducing their reliance on subsidies
- To improve the environment, encouraging sustainable land practices, the sustainable management of natural resources and climate action
- To promote strong, sustainable rural economic growth and encourage community-led local development[206]

7.1.2 This is in line with the Ministerial programme articulated in *'Shaping a More Prosperous Future'*, which states that:

"Overall, emphasis is on support to make farming and land management more resilient for the long term, to promote a viable food production sector, to maintain rural communities and to ensure that natural resources are used sustainably with action to mitigate and adapt to climate change[207]*."*

7.1.3 In January 2014 the Welsh Government issued a consultation document on proposals for Glastir[208], which presented a powerful case for focusing on the extensive range of ecosystem services that nature provides, and ensuring that this is accounted for in the way farming and forestry is managed. Since Glastir is a central element of the RDP, its provisions are a key to the delivery of this Plan. Apart from the streamlining of delivery

[205] Common Agricultural Policy Reform: Wales Rural Development Programme 2014-2020 Final Proposals. Consultation Document. Welsh Government February 2014. WG20644. p26

[206] Welsh Government. Wales RDP draft 2014UK06RDRP004. 6 June 2014

[207] Welsh Government Natural Resources Policy Statement. *'Shaping a More Prosperous and Resilient Future'.*
October 2013

[208] Welsh Government Proposals for the Glastir Scheme. Consultation Document. January 2014

mechanisms, two important themes are discussed: the move towards co-operative approaches to delivering ecosystem services (p9), and towards a market-based system of payments for such services (p10). These proposals have been taken into account in this assessment.

7.1.4 The following points have emerged from the assessment (in no particular order):

- As the RDP develops, it should seek opportunities to co-ordinate with the ERDF and ESF to deliver environmental benefits by harmonising funding and by supporting projects that the RDP cannot deliver alone.

- Some aspects of the current Glastir scheme, such as the Common Land Element, have been well received, largely because of the work of the support officers[209]. The development of a single common land scheme, with enhanced roles for development officers, will be beneficial.

- It is essential to provide adequate training for staff delivering the Farm Advisory Service and agri-environment schemes to ensure that environmental priorities are highlighted. The service should work closely with the statutory environmental bodies and the NGOs to provide high quality advice.

- Some effects may not become immediately apparent. Monitoring is therefore critical. There is a need to fund follow up monitoring, to train individuals and to co-ordinate results, some of which are not easily accessible.

- The previous SEA highlighted the need to ensure adequate funding for the protection and enhancement of Natura 2000 sites, and to meet the obligations of the Water Framework Directive. It is reassuring to note that the area-based measures refer specifically to these concerns. ERDF funding may provide further opportunities.

7.1.5 The RDP clearly has the potential to protect and enhance ecosystem services and biodiversity values, culture and heritage

[209] Glastir Stocktake. 2012

and climate issues. The decision to vire the maximum 15per cent from Pillar I to the RDP in particular will provide additional opportunities to meet future challenges to the rural environment.

7.1.6 Without the RDP it is arguable that significant and urgent interventions would not take place, and some of these aim to address the Welsh Government's targets to reduce carbon emissions, to improve air quality and to reduce Wales' ecological footprint.

8 MONITORING

8.1.1 The SEA Guidance defines significant effects as positive, adverse, foreseen and unforeseen. The methods and scope for gathering information either directly or indirectly are not defined. There is no requirement, for instance, to aggregate or collate potentially relevant data from other monitoring sources under other laws or programmes[210].

8.1.2 There are three key challenges related to monitoring the environmental effects of the RDP. Firstly, the data is dispersed across a number of statutory and non-statutory bodies. The bringing together of three statutory bodies into Natural Resources Wales will help to bring together a significant amount of environmental data related to the plan's implementation. Nonetheless, it would be helpful for Welsh Government to ensure some co-ordination between collating the data needed to address the RDP objectives and that needed to address the environmental objectives in this report.

8.1.3 The second issue is that it in some cases environmental effects may be impossible to attribute directly to the RDP. The Welsh Government has a legal duty to promote sustainable development, and its Programme for Government is based on sustainable development principles. A wide range of parallel actions are likely to deliver on these objectives were the funding to be available. It is impossible at this level to determine the synergies and tensions between the RDP, the ERDF and other interventions that might determine particular environmental outcomes.

8.1.4 For example, whilst it is possible to calculate an output, such as biodiversity increases from a particular project, the overall *outcome* in terms of overall biodiversity gains in a particular area is likely to be influenced by other factors, not least climate- related phenological changes. This makes it difficult to report genuine environmental gains (or losses) in a way that can be confidently attributed solely to the RDP.

8.1.5 The third challenge is a logistical one. Different measures are needed for different environmental targets, and they often

[210] (COWI/AS Denmark 2009 p133).

require different timescales incorporating different skills in capturing and analysing data. The costs entailed are significant, and therefore adequate monitoring may be influenced by economic constraints. Some degree of self reporting might be possible, but this would still require sampling for ground truthing purposes.

8.1.6 Monitoring, and especially programme evaluation, should therefore be approached with these challenges in mind.

8.1.7 Table 12 summarises the key monitoring bodies for the SEA objectives identified above. Welsh Government and its departments, including WEFO, will monitor a number of outputs and outcomes related to the RDP indicators listed in paragraph 2.4.2. University departments are also commissioned to carry out monitoring on behalf of the statutory bodies and the Welsh Government. Organisations such as the Health and Safety Executive are responsible for monitoring workplace safety issues. NRW monitors the state of Wales' woodlands and the condition of tree species, including threats from diseases. Local councils undertake monitoring of the effects of their spatial planning policies as required by the Planning and Compensation Act 2004, as well as a number of environmental and health topics including air quality and waste.

Table 12: Monitoring against SEA objectives

SEA Objectives	Monitoring implications
Improve physical and mental health and reduce health inequalities	The Public Health Observatory monitors health and wellbeing issues and maintains databases
Protect and enhance biodiversity	NRW monitor condition of sensitive sites/species; Appropriate Assessment case studies/invasive species/data on landscape character Wildlife NGOs monitor condition of BAP species and habitats; maintain databases Local authorities hold ecological data
	Cadw - monitors condition of historic

Protect places, landscapes and buildings of historic, cultural and archaeological value	buildings; archaeological trusts - monitor condition of sites; Royal Commission on Historic and Ancient Monuments - maintains database Local planning authorities - monitor building standards; conservation areas; development management; listed buildings; maintain EIA databases Archaeological Trusts maintain relevant data and carry out research
Protect soil quality and quantity	A wide range of institutions carry data, including CEH; NSRI; Countryside Survey; UK ECN. BGS. Forestry Commission maintain soil databases for planting.
Protect the water resource and ensure its sustainable use	Water companies/NRW monitor abstraction and discharges of water; losses. Flood risk databases.
Protect and improve water quality	NRW monitors ecological and chemical condition of river systems; bathing water quality; maintains databases. Water companies monitor chemical quality
Protect and improve air quality	NRW and local authorities issue permits and monitor air quality; maintain databases
Limit and adapt to climate change	WG - Estimated decrease in GHG
Minimise waste increase re-use, recycling and recovery rates	Local authorities monitor municipal waste including recycled waste; on farm monitoring for farm waste
Minimise the need to travel; provide alternatives to car use	WEFO - Public transport services created or improved WEFO - Total length of new railway line (including TEN-T) WEFO - Total length of reconstructed or upgraded railway line (including TEN-T)
Maintain and enhance animal welfare standards	Farm Animal Welfare Committee provides advice and collects data; NFU/FUW; RSPCA collects data; Welsh Government Office of the Chief Veterinary Officer; Defra

	gathers statistics
Optimise opportunities for rural tourism whilst minimising negative impacts	National parks and AONBs monitor visitor statistics; Visit Wales and Regional Tourism forums maintain records.

8.1.8 It is not possible to monitor everything. Environmental indicators are a 'proxy' of the state of the environment, and where carefully selected will provide a picture of its condition. It is critical that indicators are sufficient in number to be comprehensive, but do not duplicate unnecessarily. It is important when aggregating data to higher levels, to ensure that critical factors are not lost, such as cumulative effects over periods of time that in themselves are not significant. It is also critical to capture *quality* as much as quantity. Simply quantifying the number of schemes entered into, or the amount of fencing or planting, does not in itself confirm that there has been an increase in quality environments. The indicators below have been selected to reflect the objectives, and aim to be sufficient enough to be reasonably attributable to the Welsh Government's rural programme.

Table 13: Objectives and indicators

Population and human health	Improve physical and mental health and reduce health inequalities	Minimise environmental nuisance noise and light pollution Promote access to the countryside Promote learning in, about and for farming and forestry Increase access to locally produced high quality foods	Change in number and extent of tranquil areas Percentage of dark sky at night by area Numbers of farm education visits Availability and type of locally available produce

Biodiversity	Protect and enhance biodiversity	Avoid damage to sites of European conservation value and enhance them where possible Protect and enhance rare or endangered species and habitats and provide opportunities for habitat creation/restoration Protect habitats and minimise the fragmentation of nature corridors and networks in accordance with Biodiversity Action Plans, and improve these where possible Avoid damage to sites of geological interest	Conservation status of SAC/SPA features dependent on/impacted on by agriculture Conservation status of target species/habitats dependent on/impacted on by agriculture Conservation status of NNR/SSSI features dependent on/impacted on by agriculture Presence & condition of unfarmed features - hedges, scrub, fallow areas, buffers, trees, ditches & ponds Percentage area of independently certified woodland (such as FSC)

Biodiversity (continued)	Protect and enhance biodiversity	Promote agri-diversity through support for endangered local breeds Promote indigenous woodland species Support biodiversity health through the management of disease and invasive species	Lowland/upland farm birds - target species, presence, numbers - overwintering, breeding, spring feeding Woodland birds - target species, presence, numbers - overwintering, breeding, spring feeding Presence/location of invasive species Condition of Geological Conservation Review (GCR) sites that are SSSI's Common land in management agreements

Culture, architecture and archaeology	Protect places, landscapes and buildings of historic, cultural and archaeological value	Improve the quality of the local built environment Promote the re-use of previously developed land and buildings Protect village greens and community wildlife areas/ woodlands Promote and market locally sourced products Protect archaeological sites on farmland Protect and improve the stock of listed buildings	Condition of sites on agricultural land Number and condition of listed farm buildings LANDMAP culture aspects - condition Number of community-owned or managed biodiversity/amenity assets Register of SAMs - condition status Number and location of farmers' markets/ community local product market stalls
Soils	Protect soil quality and quantity	Maintain and enhance soil quality in terms of porosity, biota and structure Minimise soil erosion through run-off, wind and tillage Optimise the capacity of soils to sequester carbon	Change in soil organic carbon, acidity, nitrogen, biology Water capture Changes in compaction, erosion Changes in area of grassland and woodland
Water resource	Protect the water resource and ensure its sustainable use	Complete flood and coastal risk plans Promote technology to conserve and recycle water	Water abstracted for agriculture (licensed) Water abstracted for agriculture (unlicensed) Agricultural discharge to water courses Change in crop type Number and cost of flooding incidents

Water quality	Protect and improve water quality	Protect and enhance the quality of groundwater, rivers, lakes, and coastal waters Comply with 'good' status under the Water Framework Directive (WFD) Protect and enhance the salmonid and other fisheries Avoid physical disturbance to the water and water edge environment Reduce diffuse pollution from agriculture and other sources Ensure sustainable drainage systems in development	Bank erosion remediated (length) Chemical/ecological quality of rivers Number of agriculture-related pollution incidents Eutrophication statistics Estuary water condition Bathing water quality Area designated as Nitrate Vulnerable Zone Number of water pollution incidents, category 1 & 2
Air quality	Protect and improve air quality	Reduce atmospheric hazards such as ammonia, methane and carbon dioxide Reduce the risk from radon	Change in ammonia,CH_4, N_2O, ozone Air quality incidents Radon remediation programmes Percentage of sensitive habitat area exceeding critical loads for acidification and eutrophication

Climate issues	Limit and adapt to climate change	Reduce emissions of greenhouse gases, especially N_2O and CH_4 Minimise the requirement for energy generation Promote efficient energy use Increase the use of energy from renewable resources including hydro-systems and biomass Promote ICT as an alternative to travel and print	CH_4 emissions from livestock Number of micro-generation schemes established Change in rural ecological footprint
Waste management	Minimise waste increase re-use, recycling and recovery rates	Restrict biodegradable materials going to landfill Promote anaerobic digestion Promote the use of organic waste to agriculture where appropriate	Amount of biodegradable material going to landfill Amount of biodegradable material going to anaerobic digestion Amount of organic waste to agriculture
Transport infrastructure	Minimise the need to travel; provide alternatives to car use	Protect and enhance the public transport system Optimise opportunities to work locally Promote non-recreational walking and cycling	Availability of public transport (bus and rail) - national, National Park/county, local buses; taxis; community schemes Promotion of public transport associated with tourism

Animal welfare/disease transmission	Maintain and enhance animal welfare standards	Improve on-farm animal welfare standards Reduce stresses related to transportation Minimise the risk of animal-animal/animal-human disease transmission	Number of Farm Health & Welfare Plans based on risk assessments Number of farms with separation / quarantine facilities Number of farms with contingency plans in place Sales of Welsh higher welfare products
Rural based tourism and access	Optimise opportunities for rural tourism whilst minimising negative impacts	Optimise opportunities for engagements with wildlife/food production Protect and enhance access to the coastline and countryside Protect rights of way, open space, and commons	Hectares of Open Country and Common Land Length and condition of PROWs Amount and condition of accessible land in agri-environment schemes

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