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Wales **Rural** Observatory

Assessing the Eco-economy of Rural Wales

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Research Report 11

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PREFACE

Following two reports by the Wales Rural Observatory concerned with labour markets in rural Wales, *The Rural Business Survey* (2004) and *Rural Labour Markets: exploring the mismatches* (2006), this report is a more focused scoping and pilot study on the eco-economy of rural Wales. The eco-economy research project ran from January 2006 to March 2006. In highlighting the richness of the natural resources of rural Wales we point to some of the ways by which entrepreneurs are mobilizing natural resources; the socio-economic benefits that are accruing; and the potentialities of the eco-economy. This report lays the foundation for a broader and deeper assessment of the eco-economy in the second phase of the Wales Rural Observatory.

ASSESSING THE ECO-ECONOMY OF RURAL WALES

1. INTRODUCTION

This research project and report on the eco-economy in rural Wales builds on the work done by the Wales Rural Observatory [WRO] in investigating labour markets (WRO, 2006). In addition to identifying significant mismatches in rural labour markets, and the variable existence of a rural 'spiral of decline', the WRO rural labour market report identifies the need, especially in the context of the new spatial planning approach (Welsh Assembly Government, 2004), to assess the endogenous potential of rural areas by considering the potentialities of the rural eco-economy. That is the variable ways in which many of the aspirations and visions contained in the sub-area statements of the new spatial plan can be realised through both harnessing environmental added-value and creating more environmental goods and services firms. The labour market report goes on to suggest that the onset of a spatial planning approach in Wales could open the door for more innovative eco-economic thinking, and provide a basis for both bridging the traditional and economically thwarting divide between environment and employment, and begin to reverse the persistence of the complex business and labour mismatches that the report identifies in rural Wales.

In the economic context, there are, historically, two polarized perspectives on the environment. Firstly, there is the largely discredited and outdated economic argument whereby the environment is perceived as a key obstacle to development. From this perspective the environment represents a barrier to the economy, which, if it is to be overcome, must be altered, rendered impotent or obliterated. Secondly, there is the approach employed by certain interest groups who have used the environment to prevent development. These groups argue that the environment, especially in rural spaces, is inviolable and that no development should be undertaken that has the potential to damage or degrade it. In contrast the discourses of sustainable development broadly conceived, and, more particularly, ecological modernization, turn around these two approaches. Theorists and practitioners of sustainable development and ecological modernization seek ways to establish a mutually reinforcing relationship between environment and economy; the environment can assist the economy and the economy enhances the environment under new models of development.

At this juncture it is useful to develop a definition of the rural eco-economy. We draw on recent reports, first, to define the environment as:

> The natural and historic built heritage including
> - The landscape, geology, water, land, air and wildlife elements
> - The historic built heritage including scheduled monuments, listed buildings and conservation areas
>
> The definition excludes cultural and historic heritage represented in the museum, gallery and arts sectors as well as the urban environment apart from those parts of the built heritage defined above.
> (National Trust Wales, 2001, p7).

Second, one working definition of the environmental economy, which also introduces the rural dimension is:

> The "environmental economy" can be defined to include a variety of economic activities that are either concerned with the management and enhancement of the environment, or that benefit from the quality of the environment. The "rural environmental economy" is simply the subset of these activities that are concentrated in rural areas. (GHK, 2003, p3)

Defining the ecology as the relationships and interactions between organisms (including humans and their various activities and outputs) and their natural environment, and building on the two definitions above; further developing the two definitions above; and drawing on Brown (2001), we may define the eco-economy of rural Wales as:

> **The effective management of environmental resources in ways designed to mesh with and enhance the local and national ecosystem rather than disrupting and destroying it. That is, the eco-economy consists of viable businesses and economic activities that utilize the varied and differentiated forms of environmental resources of rural Wales in sustainable ways that do not result in a net depletion of resources but provide net benefits and add value to the environment.**

We would argue that this needs to go further in the sense that it is not a one-way process; rather it is that environmental and economic development initiatives can potentially and sufficiently intertwine such that they create economic and environmental added value through production and service activities in the rural sphere and between the urban and rural spheres.

In addition, it should be noted that a great deal of work in environmental economics has concentrated on identifying and measuring potential externalities that arise when environmental resources are economically mobilized (e.g. Pearce and Turner, 1990). [1] But this tends to hide the point that consumer demand requires alternative or better designed products and services from rural firms. There is, then, a need to build the eco-economy into new regional debates.

Rural Wales possesses an abundance of environmental resources and is well positioned to exploit the eco-economy. The WRO labour market report observes, however, that it is ironic that it is those most beautiful and ecologically rich (e.g. western and Atlanticist) parts of rural Wales that are also suffering from the more entrenched forms of economic inactivity on the one hand, and employer-employee mismatch on the other. Indeed, the mismatches in rural Wales identified in recent WRO reports would appear to be evident in an eco-economical mismatch: a mismatch between high environmental value and low economic activity. The question is - why do these mismatches arise? The labour markets report goes on to suggest that in policy terms they may also reflect a long-running UK policy disability to creatively link environmental value with economic added value: that is, to create and innovate sustainable economic development (WRO, 2006, p79). Moreover,

[1] An economic externality is a consequence of production ignored in pricing. For example, environmental damage that results from a production process but is not taken into account in establishing a market price for the good produced.

to date neither the academic nor the policy literature has integrated the eco-economy into the question of how the rural 'spiral of decline' could be potentially reversed.

This research project has, then, the following aims and objectives:

- To identify existing components of the eco-economy.
- To assess the current value of the eco-economy.
- To assess the potential of the eco-economy.
- To examine, using a variety of techniques, how the potential synergies between environmental and economic activities can be enhanced.
- To investigate how the rural environment and economy can be mutually reinforcing to reduce mismatches.

Following this introduction, this report falls into the following chapters. The methods used for research and analysis are described in Chapter 2 Chapters 3 and 4 discuss, respectively, the academic context for the eco-economy of rural Wales, and the sustainable development policy in Wales. The value and scope of the eco-economy of rural Wales are assessed in Chapter 5. Chapter 6 consists of fieldwork on six case-studies of businesses in rural Wales that, we suggest, are part of the eco-economy. Finally, in Chapter 7 data from the preceding chapters are brought together and analyzed; synergies and potentialities identified; and some concluding hypotheses made.

2. METHODOLOGY

Before discussing the methods used in this research project, it is useful to re-state how we define the eco-economy of rural Wales:

> **We may define the eco-economy of rural Wales as the effective management of environmental resources in ways designed to mesh with and enhance the local and national ecosystem rather than disrupting and destroying it. That is, the eco-economy consists of viable businesses and economic activities that utilise the varied and differentiated forms of environmental resources of rural Wales in sustainable ways that do not result in a net depletion of resources but provide net benefits and add value to the environment.**

In addition, we reiterate the need to go further in the sense that it is not a one-way process; rather it is that environmental and economic development initiatives can potentially and sufficiently intertwine such that they create economic and environmental added value through production and service activities in the rural sphere and between the urban and rural spheres.

In outline the research methods used were:

1. A review of the academic literature to identify essential themes.
2. A review of the policy literature to identify how far these themes are being incorporated at present.
3. A scoping exercise to identify the more specialized existing components of the eco-economy, and where possible to assess the value of the components.
4. A series of six case-studies of businesses and projects involved with eco-economy.
5. Analysis to identify synergies and potentialities in the eco-economy.

These research tasks were, in essence, completed in sequence.

2.1 The academic literature – Chapter 3

The review of the academic literature is deliberately concise. It provides the academic context for the eco-economy by summarising the development of two strands of environmentally-related thought: the discipline of ecological economics and the discourse of sustainable development, and the subsequent development of ecological modernization. Ecological economics is concerned with the effective management of natural resources in ways that conserve and sustain natural resources, environment and ecology, while retaining the bottom-line of profitability; ecological economics is, then, concerned with how to achieve a sustainable economy. Sustainable development has evolved into a pervasive discourse in policy-making. We argue, however, that in view of sustainable development's ambiguity, ecological modernization offers more precision and prescription concerning how to move towards sustainable economic practices: which

must be at the core of the eco-economy. Moreover, we suggest that the case studies presented in this report are examples of ecological modernization in practice.

2.2 The policy literature – Chapter 4

The review of the policy literature outlines the policy framework for the eco-economy in rural Wales. This framework is constructed around policies for sustainable development in Wales. In analyzing this policy framework, we suggest that there is the potential to develop an integrated rural policy framework for Wales, specifically a framework that incorporates the eco-economy, although there are a number of issues to consider. Foremost of these issues is the recognition that rural is a diverse and variably constructed concept, which makes it difficult or potentially inappropriate to formulate specific rural polices.

2.3 Assessing the value of the existing eco-economy – Chapter 5

Drawing on documentation and data from a range of sources, in this chapter we consider those parts of the current rural economy that resonate, in full or in part, with the definition of the eco-economy or that have the potential to contribute to it. The chapter is in two parts. Firstly, we assess the scope and value of the rural eco-economy in general terms. Secondly, we pay attention to the different sectors of the eco-economy.

2.4 The case studies – Chapter 6

Six case studies were chosen to provide both geographical and sectoral coverage. The case studies were:

1. An equine business in Monmouthshire.
2. A produced of organic apple juice in Powys.
3. A water sports and management clinic in Pembrokeshire.
4. A National Trust project in Carmarthenshire.
5. A community windturbine on the borders of Gwynedd and Powys.
6. A Forestry Commission mountain-bike course in Gwynedd.

These sites were visited and face-to-face interviews conducted. The interviews were semi-structured, and to ensure consistency and comparability they all covered the following themes:

1. Biography/history of business/venture
2. Finance – Grants etc
3. Obstacles to be overcome – e.g. Planning, NIMBY, local objections
4. What and where is the market for business/venture
5. How things are now with the business/venture
6. How many people employed
7. Socio-economic impacts
8. Connections to local communities
9. Value added for local communities
10. Significance of natural (local) environment

11. How business/venture connects with environment
12. How business/venture enhances local environment
13. Innovation
14. Potential
15. Synergies with other environmental and/or business sectors
16. Good practice

All of the interviews were recorded and transcribed. Each of the six case studies is awarded its own section for description and preliminary analysis.

2.5 Analysis

The analysis draws together the evidence from the other chapters to identify synergies and potentialities in the eco-economy.

3. THE ACADEMIC CONTEXT FOR THE ECO-ECONOMY OF RURAL WALES

The academic context for the eco-economy, as defined, has two principal roots: ecological economics, which has developed from environmental economics, and ecological modernization. Arguably, the search for eco- economic efficiency, the integration of economy and environment, begins with the assimilation into economics of two laws of physics: the First and Second Laws of Thermodynamics. The First Law of Thermodynamics states that energy and matter can neither be created nor destroyed. This brought into prominence the idea of planet Earth as a closed economic system with finite resources (Boulding, 1966). On this model, economic processes produce wastes and other externalities. Environmental economics focuses on the internalization of such externalities, often through market-based mechanisms such as carbon taxes and tradable permits in pollution.

Recycling can convert some of the wastes back into resources but those wastes that cannot be recycled are returned to the environment, which acts as a sink. The reason why not all wastes can be recycled is given by the Second Law of Thermodynamics or Entropy Law, which states that in the universe there is a continuous and irrevocable degradation of free (usable) energy into bound (unusable) energy (Georgescu-Roegen, 1971). This implies that the energy available from natural resources will degrade, over time, into forms that are not available for use; materials are dissipated within the economic system and entropy increases (Pearce and Turner, 1990). A range of intra-disciplinary disputes has emerged concerning the relationships between entropy, free energy, work, heat, recycling and the reversibility of economic and industrial processes (e.g. Gillett, 2006; Lozada, 2006). It is, however, the inclusion of entropy in its philosophy and calculations that, arguably, differentiates ecological from conventional economics, including environmental economics (Daley and Farley, 2004). Conventional neoclassical economics assumes that the economy is a closed system but, as Daley and Farley highlight, economies actually function in and are dependent on the ecosystem; subject to the laws of thermodynamics and characterized by throughput of resources and the production of waste – that is, entropy that cannot be necessarily internalized. Daly and Farley challenge another key assumption of conventional economics; that allocative efficiency is the primary desirable outcome of economic activity. In arguing that just distribution and sustainable scale should be the aims of economic activity Daly and Farley point to the core of ecological economics - to find more efficient ways of utilising natural resources: ways that conserve, balance and sustain natural resources, environment and social considerations, while retaining the bottom-line of profitability:

> 'Ecological economics is based on the tenet that all economic activity must be regarded as a subset of the ecosystem in which the economy is embedded and on which it depends. Of specific concern are the limits of ecosystems to handling human impacts and of the possibilities for human systems to maintain or increase quality of life.' (Ruth, 2005, p336)

Ecological economics as a discipline seeks to address a number of issues. Foremost among these issues is the articulation of a theory of value with the premise that global sustainability can be achieved; a theory that respects the complexity of the natural world and its ecology while retaining the benefits of free markets. Other issues under consideration include how to measure ecological costs; what changes are required for a

sustainable economy; how to address social inequities; and the role of the market. Recent, subject-specific academic work on these problems includes explorations of new ecological approaches to economic efficiency (Jollands, 2006); to ethics and environmental management (Azqueta and Delacamara, 2006); to the theory of economic value (Nadeau, 2003); to material flows and natural capital (Hintenberger *et al*, 1997); and complex systems approaches to the value of ecological resources (Straton, 2006). More generally, although the contribution of Beckermann (1995) that conventional economics is quite capable of delivering sustainable development should be noted, authors such as Brown (2001), Wubben (2000), and Starkey and Welford (2001) argue that the incorporation of ecological principles into economic and regulatory systems is a necessary condition for sustainable development.

3.1 Sustainable development and Ecological Modernization

The development of ecological economics may be seen as a dimension of the gradual recognition, witnessed during the second half of the twentieth century, that the, principally Western, economic model, the 'growth machine', was causing severe consequences for the world ecology such as global warming, climate change, forest depletion, ozone degradation, natural habitat loss, the extinction of some species, and biodiversity loss. Initially, this recognition was driven by academics, philosophers of nature and science, and radical protest movements, which because of their adherence to ideas and political theories such as anarchism, Marxism, perceived eco-fascism and their critique of capitalism tended to fall outside the consideration of modern democratic systems. In the last twenty years, however, ecological concerns have become part of mainstream politics and some ideas from these radical movements have been assimilated. For example, bioregionalism (e.g. Sale, 1985; Berg, 1991; McGinnis, 1999) rejects existing state boundaries, political structures and hierarchies, and capitalism but its advocacy of administrative systems based on natural boundaries such as watersheds and river catchments has caught the attention and interest of environmental policy makers.

The pre-eminent example of the assimilation into national and global politics and policy-making of environmental and ecological thought is sustainable development. Sustainable development suggests that the often competing needs of economy, society and nature can be met, with especial attention to the requirements of economic growth, social justice, ecological protection and inter-generational equity. However, what sustainable development means in practice is a matter of considerable dispute, and as Dryzek, (1997) argues, the notion of sustainable development receives greater precision in the discourse of ecological modernization [EM], which is concerned with restructuring the capitalist political economy along more ecologically sound lines:

> 'The capitalist political economy needs conscious reconfiguring and far-sighted action so that economic development and environmental protection can proceed hand-in-hand and reinforce one another.'
> (Dryzek, 1997, p65)

EM theory originated in the 1980s in a European context (Huber, 2000). A key issue at the root of the theory is how to continue to develop the economy at the same time as ameliorating the detrimental environmental effects outlined above. In short, how to create 'win-win' solutions; or what is now often regarded in business circles as the 'triple bottom line'- whereby economic yields are matched with social as well as ecological

benefits. Theoretically it poses a question; how to achieve 'ecological consistency between material flows, resource use and consumption?' (Andersen and Massa, 2000). Or, to put it another way, how to reduce the effects of the second law of thermodynamics. Basic features of EM are:

- A belief in managed technological modernization and innovation as a means for its achievement
- Double dividends [2] and triple bottom lines are potentially feasible in the right technological market and policy environment.
- Business responsibility and accountability.
- Policy integration across sectors.
- Use of Green Taxes.
- Eco-efficiency - exploring the ways of reducing inputs without affecting outputs (for example, less use of carbon fuels and wastes thereof).
- Adoption of the Precautionary Principle at all levels of policy making and business decision-making.
- Using technological innovation as a means of achieving the precautionary principle.
- Greening supply-chains and adopting a supply chain approach to ecological development.
- Being institutionally reflexive – institutions should be self-critical concerning their practices.

3.2 Towards Sustainable development in practice

At the level of practice the work of the New Economics Foundation [NEF] is instructive. For example, NEF have suggested the 'leaky bucket' concept to characterize local economies. The 'leaky bucket' argument is that too much money leaves local economies in the forms of profits to external investors; salaries to non-local people; and energy bills; which to an extent resonates with the entropy concept (drawing the analogy that resources leaked from local economies are unusable wastes). NEF argues that sustainable development, at local scales, would be better achieved if ways could be found to re-circulate monies locally through wages for local jobs and people; locally produced goods and services; local markets; and the local production of energy, particularly from renewable sources – and its economic effect multiplied. Such developments often require the acquisition of new skills.

The 'leaky bucket' concept, while highly relevant to the situation of many local economies, is a more global concept; one that can be applied to all economies. In the context of rural development, van der Ploeg *et al* (2002, p12) present a theoretical model of how farm enterprises acquire new skills and move towards multi-functionality. On this model, van der Ploeg *et al* suggest that farm enterprises comprise three aspects. First, there is the classical side of agricultural production: milk, livestock and crops. Second, there are the interactions, either enhancing or degrading, with the rural landscape and its inherent values. As van der Ploeg *et al* argue, this aspect forms an intrinsic part of local and regional culture, and the social fabric of the countryside. Third, there is the

[2] The notion that environmental taxes can both reduce pollution (the first dividend) and reduce the overall economic costs associated with the tax system by using the revenue generated to displace other more 'distortionary' taxes that slow economic growth at the same time (the second dividend).

mobilization and use of resources. These three aspects are interdependent and any rural enterprise that uses natural resources, if it is to succeed, must coordinate them. Van der Ploeg *et al* further argue that during the processes of rural development the relations between these three aspects are both reproduced and transformed. Agricultural activities are deepened; transformed and expanded by linkages and associations with new actors and agencies as farm enterprises focus on new products that add more value in the new markets demanded by wider society. Typical examples of deepening are organic farming; high quality foods through on-farm production; and short linkages between production and consumption created by selling to local markets such as farmers markets. The interactions with the rural environment are subject to broadening. Examples here are agri-tourism; environmental and landscape management though agri-environmental schemes; new on-farm activities; and diversification. The third aspect is the mobilization and use of resources and here van der Ploeg *et al* identify a process of re-grounding. Enterprises are grounded in new or different sets of resources, and become involved with new patterns of resource use. Van der Ploeg *et al* explore a number of case studies of farm enterprises in Europe. We suggest that these processes of broadening, deepening and re-grounding to better utilize natural resources and the ecology represent EM processes. Further, we argue that the model is adaptable and transferable to enterprises, other than farming, that use natural resources in rural areas, such as the case studies from the rural Wales eco-economy presented later in this report. We present this model, together with findings from van der Ploeg *et al*'s case study of Welsh agri-environmetal schemes, in Chapter 7 of this report.

Other relevant European studies include the EU project 'Building New Relationships in Rural Areas under Urban Pressure' otherwise known as 'Building Rurban Relations', which studied cases in Finland, France, Hungary, the Netherlands and Spain with the aim of assisting enterprises in rural areas to provide and trade in rural goods and services, related to landscape and environment. (e.g Andersson, 2005; Esparcia and Buciega, 2005). In summary the conclusions of this work are that, firstly, producers of rural goods and services tend to be on a small scale. Secondly, that many rural enterprises are started and run by in-migrant entrepreneurs. Thirdly, in areas with strong and regulated agricultural sectors the market in rural goods and services tends to be reduced in scope. However, agriculture remains an important engine for both the production and consumption of rural goods and services. More broadly, it was argued that although many rural areas are under increasing urban pressure, particularly from in-migrants and real estate markets, this pressure is accompanied by potential new markets for enterprises providing rural goods and services. A differentiation was made in this study between rural areas close to large cities and conurbations, and more remote tourist areas. Those rural areas close to larger urban settlement were found to be under especial housing pressures and to have less potential for their rural goods and services, although potential markets were still held to be 'considerable', than more remote areas. In the latter, although their remoteness and lack of internal resources remained problematic, markets in rural goods and services tended to be larger and more certain of development in view of expanding and changing tourist markets.

This research does not cover Wales and there are issues of scale, with comparatively small distances between settlements and Cardiff, the largest city in Wales, having a population of 300, 000. Nevertheless, owing to the ruggedness of much of the Welsh landscape, the differentiated categories of rural area are identifiable in Wales and the findings of this research are applicable there.

3.3 The environmental economy in south west England

Turning back to the UK, it is useful to present outline data from a recent report on the environmental economy of the rural areas of south west England (GHK, 2003), as the rural areas of the south west of England have many factors in common with rural areas in Wales: such as beautiful scenery; historic, cultural features; remoteness; high unemployment and rates of economic inactivity; in places a reliance on tourism and seasonal work; a tendency to less than adequate communications and transport networks; and the potential to develop an economy that meshes effectively with the local natural environment. The GHK report points to key relationships between the south west England economy and the natural environment; relationships that, to some degree, are applicable also to rural Wales:

- over 12% of the regional economy relies on the land, landscape or sea;
- the quality of life (often associated with environmental quality and cultural opportunities) in the region is a major attractor of investment, businesses, workers and tourists;
- business efficiency can be enhanced through better environmental management;
- environmental technologies and services, such as renewable energy, represent a huge global market where the SW can become a leader. (GHK, 2003, p5)

Headline data from the GHK report indicate that in rural areas of south west England:

- The environment sector – c.38,000 jobs and c.£833 million output in environmental industries, environmental management, renewable energy, waste management and the natural environment sector.
- Regenerating the primary sector – c.600 jobs and c.£13 million output in agri-environment, organic farming, regional produce and multi-purpose forestry.
- Capitalising on a high quality environment – c.55,000 jobs and c. £744 million output mostly in tourism but recognising other links through film/media, inward investment and quality of life. (GHK, 2003, p3-4)

The aim of the report was to set out a framework for programming development activity for rural areas in south west England, which would create employment and economic opportunities that used, sustained and enhanced the natural environment of these areas. In setting out this aim the report defined the "environmental economy":

> '….to include a variety of economic activities that are either concerned with the management and enhancement of the environment, or that benefit from the quality of the environment.' (GHK, 2003, p3)

Later in the report this definition is qualified:

> 'In this paper it is assumed that environmental economic activity should aim primarily to enhance the contribution that the environment makes to economic development while having at least a benign, and wherever possible a positive, impact on the environment itself.' (GHK, 2003, p13)

Drawing on other studies of rural economies (National Trust, 2001; Countryside Agency 2003; other GHK reports; and a range of reports by ERM), the GHK report makes a number of definitions of:

- The fabric of the countryside (countryside capital/environmental capital).
- Economic activities that manage or enhance the environment and build countryside capital/environmental capital.
- Economic activities that use countryside capital/environmental capital.
- Linkages between the two types of capital-based approaches.
- Sectoral approaches to the rural environmental economy, which are useful for quantification and assessment.
- The specific linkages with the environment of specific sectors, which are often very different for each sector.

Pointing to the more general linkages that exist in supply chains in the environmental economy, such as management and conservation (enhancement of environmental capital) and downstream activities that benefit from enhanced environmental capital, the GHK report argues that there is potential for market failure:

> ..the separation between those who incur the costs and those who provide the benefits means that markets are likely to under-provide environmental goods and services. This gap can be (and is, at least to some extent) addressed by public sector investment in land management (e.g. agr-environment and woodland management schemes, management of nature reserves etc). Thus there are strong inter-linkages in the environmental economy between the production of public and private goods and services. (GHK, p11)

The GHK report discusses a number of key issues in the environmental economy (2003, p15). In summary these are:

- Although win-win situations are possible, the aims of environmental action plans and policy should be to either:
  - To achieve economic outcomes and benefits.
  - To achieve environmental outcomes and benefits.

  The report argues that there are risks in confusing aims and objectives.

- At regional levels, greater impact will result from economic activities that bring money into the region, rather than shifting it around the region. Activities that bring additionality should be prioritized.
- Priority should be given to those activities that have a competitive advantage – e.g. activities associated with regional and cultural identity, image, brand and future strategy.
- There is a strong case for promoting those activities of the environmental economy that are not already in promotional programmes.
- Synergies – the ability of different types of activity to reinforce one another – should be sought and encouraged.
- The place specificity of economic activities is an important aspect of viability.

3.4 Summary of literary context

This outline review of studies relevant to the development of the eco-economy shows that at the core of the two academic roots of the eco-economy, ecological economics and EM, lies the search for the integration of environment, economy and society in sustainable development. The development of EU environmental policy since the late 1970s exhibits attempts to adopt some of the principles of EM, for instance:

- 1977 1st Environmental Action Programme
- 1987 Single European Act
- 1988 5th Environmental Action programme
- 2000 6th Environmental Action Programme announced with a raft of EM principles.

Sustainable development is, however, the predominant policy discourse of the Welsh Assembly Government and, as such, sustainable development provides the potential policy framework for the eco-economy of rural Wales.

4. SUSTAINABLE DEVELOPMENT POLICY AND WALES

The Welsh Assembly Government [WAG] is unique for a legislative body in Britain, and probably in the EU, in having a statutory requirement to promote sustainable development. There are three key elements of this piece of legislation: its statutory binding nature, together with the fact that this function must be carried out by WAG and cannot be delegated; the inclusive and open nature of the process for producing sustainable development strategies and plans; and the fact that WAG have control of the function, with any reporting or evaluation directly to WAG, and not the UK government. [3]

A UK wide sustainable development strategy is in preparation – the *Taking it on* consultation exercise, leading to the new strategy *Securing the future* (Defra, 2004). But, in a recent report, Flynn and Marsden (2006, p12) observe that although the UK-wide strategy implies an expectation that the different parts of UK government can co-operate to deliver common sustainable development goals, it does not contain structures or processes to achieve this, and fails to address the particular issues and demands on policy making implied by devolution. They argue that the consequence of this strategic oversight is that:

> At a political and civil service level the UK strategy for sustainable development is almost an irrelevance. Policy on sustainable development is devolved to Wales and what happens at a UK level is of little interest in policy terms. (Flynn and Marsden, 2006, p18)

In effect, then, sustainable development policy is devolved to Wales, and it could be argued that WAG is in advance of the UK wide strategy. WAG has formulated its own strategy with a suite of policy outputs including '*A Sustainable Wales – Learning to Live Differently* (NAW, 2000) and '*Starting to Live Differently* (NAW 2004). The framework for the implementation of sustainable development policy is provided by the *Wales Sustainable Development Action Plan* 2004-7. [4] There is a range of policy documents that connect, to varying degrees, with the Action Plan.

The foremost of these policy documents is '*Wales: a better country*' (WAG, 2003), which together with '*A Winning Wales*' (WAG, 2002a) sets out the overarching vision and strategy for WAG's second term, with four key areas: employment; health; stronger communities; and creating better jobs and skills. '*A Winning Wales*' identifies targets for rural development and highlights the importance of interaction between rural and urban economies. An increasingly important document is the '*Wales Spatial Plan*' (WAG, 2004a), which explicitly embraces sustainable development aims, objectives and principles, with especial emphasis on joining-up other relevant policies and documents to ensure effective delivery at regional and local community levels. The new '*Environment Strategy*' (WAG, 2005a) is the third policy document connected with sustainable development, with explicit links to both the *Wales Spatial Plan* and '*A Winning Wales'*. In the economic context, the Strategic Framework for Economic Development is provided by '*Wales: a vibrant economy - WAVE*' (WAG, 2005f).

[3] Government of Wales Act 1998: section 121
[4] The signal aim of the Wales Sustainable Action Plan is to move to a low carbon economy.

Energy requirements for sustainable development are addressed by the '*Energy Route Map Consultation Document*' (WAG, 2005b) and the recently revised planning *Technical Advice Note 8* (WAG, 2005c), which provides a planning framework more conducive to the provision of renewable energy sources such as windfarms. Rural development is addressed specifically by the draft *Rural Development Plan* (WAG, 2006d). The draft *Rural Development Plan* [RDP] is, however, essentially a project statement, a mechanism to access EU funding for sustainable development, which while starting to address wider social and environmental issues still tends to focus largely on agricultural and economic development rather than their integration with other aspects of rural life such as environment, society and culture. Other policy documents for sustainable development include '*Education for Sustainable Development* (WAG, 2005d); '*Making the connections: delivering better services in Wales* (WAG, 2004b); the *Business and Environment Action Plan for Wales* (2006a); '*Sustainable Business Wales* (2006b); '*the Expert Panel on Resources Management for Wales 2005* (2005e); and '*A Better Wales*' (2006c), which identifies the potential for the development of rural Wales's distinctive landscape characteristics and biodiversity, and how agri-environmental schemes can assist the enhancement of the environment.

Taken together these policy documents represent the beginning of the development of an integrated and holistic rural policy framework for Wales, specifically a framework that incorporates the eco-economy. There are, however, a number of obstacles to overcome. A primary obstacle is how best to conceptualise 'rural'; for as evidenced by WRO research there is no one singular 'rural' but widely diverse understandings and constructions of what it is to be rural. This makes it difficult to formulate specific rural policies. In a paper that explores rural development policy networks in Wales and compares them to Finland, Marsden *et al* (2004, p98) identify a number of networks that have, to date, remained discrete. For example, they suggest that rural development programmes may be seriously hampered by more dominant regional development and agri-environmental priorities. Building on this observation, it is not yet clear in Wales how rural development lies between the RDP and the Wales Spatial Plan. Marsden *et al* argue, however, that there is a trend in Wales (and in Finland) towards the articulation and mobilization of rural development *per se* within a more conscious and strategic regional framework. Indeed, Marsden *et al*'s observation is confirmed by the convergence on the eco-economy of the sustainable development policies and the strategy for economic development.

5. ASSESSING THE VALUE AND SCOPE OF THE ECO-ECONOMY

Taken together the nine local authorities that are generally taken to constitute rural Wales (Anglesey, Carmarthenshire, Ceredigion, Conwy, Denbighshire, Gwynedd, Monmouthshire, Pembrokeshire and Powys) have 4.5 times the total land of the other thirteen local authorities in Wales. Rural Wales, as defined, has an area of 17,074 square kilometres compared with 3,728 for the rest of Wales: that is, rural Wales covers 82.1% of the total area of Wales (WAG, 2002a). In land area alone the rural parts are, then, a significant section of Wales. Much of rural Wales is land of poor agricultural quality, but nevertheless has a diverse ecology that contains a range of environmental features and natural resources that have the potential to make a major contribution to the national economy. As a consequence of the richness of its biodiversity approximately 30% of land area and 70% of coastal and marine environment are designated as high wildlife value and conservation importance at European level (WAG, 2006d). Examples of designated areas (compared to the sum for all Wales' land of approximately 20, 800 square kilometres) are:

	Number	**Area (square kilometres)**
National Parks	3	4100 (a fifth of Wales's total area)
AONBs	5	830
Agri-environmental	5639 (agreements)	5190
SSSIs	1,020	2640
Special Protection Areas	19	1370
RAMSAR sites	10	260
National Nature Reserves	67	240
Total		14630

(ONS, 2006, p6)

We suggest that environmental designation could be seen as a surrogate for high environmental value. In this chapter we further explore and assess the value and scope of the rural eco-economy of Wales.

5.1 Assessing the value of the eco-economy

Drawing on a report entitled 'Valuing our Environment' (National Trust, 2001) by a commission headed by the National Trust Wales and including the Countryside Council for Wales [CCW], Environment Agency Wales, RSPB Cymru, Heritage Lottery Fund, Wales Tourist Board and the Welsh Development Agency, Bilsborough provides headline statistics that indicate:

- Work associated with the management, use and appreciation of the natural environment in Wales creates 117,000 full-time jobs.
- Other spin-off work related to this takes the total number of jobs in Wales that depends on the environment to 169,000 – equivalent to 1 in 6 Welsh jobs.

- The management and use of the environment, and the knock-on economic effects of this, generates output goods and services worth £8.8 billion pa to Wales.

- GDP measures the 'value added' component of this total – this is £2.4bn each year, around 9% of Welsh GDP
- This work contributes around £1.8 billion in wages to people in Wales.

(Bilsborough, 2004, p1)

Bilsborough, drawing on the National Trust (2001), argues that if the natural environment was defined as a sector - in a similar manner to, for example, manufacturing or agriculture – then it would be the second most important in employment terms in Wales, after manufacturing. A number of jobs within the overall figures for the employment sectors are environmentally-related – for example:

- Employment in agriculture, forestry and fishing is 47,900.

- Employment in environmentally-related tourism is estimated to be 23,600.

- Employment with the landscape services business sector is estimated at 7,000.

- Employment in the public 'environmental sector' is 3,852.

- Employment in the voluntary environmental sector is 829.

(Bilsborough, 2004, p1)

5.2 Generalising the rural from all-Wales data

The National Trust report extracted environment-related data from all-Wales data, and the report's economic analysis has been used in a range of reports and briefing papers (e.g. National Trust, 2001; CPRW, 2004; Bilsborough and Hill, 2003). It is important to note that the original analysis was concerned with the economic impact of the environment of all Wales. When seeking to further extract the rural components from the analysis it is, however, instructive to reiterate the National Trust report's definition of the environment:

> The natural and historic built heritage including
>
> - The landscape, geology, water, land, air and wildlife elements
> - The historic built heritage including scheduled monuments, listed buildings and conservation areas
>
> The definition excludes cultural and historic heritage represented in the museum, gallery and arts sectors as well as the urban environment apart from those parts of the built heritage defined above. (National Trust Wales, 2001, p7).

From this definition it may be inferred that the principal focus of the National Trust report is non-urban Wales, apart from those structures and buildings of archeological, cultural, historical or architectural interest found in urban areas, typically in designated Conservation Areas. The findings and conclusions of this report may, then, be generalized to rural Wales. Data from the National Trust report are reproduced and discussed in Tables 5.1 – 5.5 below.

Table 5.1 Employment in environmentally related sectors

Sector	Direct FTE Employment
Voluntary environment sector	829
Public sector environmental services	3,852
Conserving the built environment	291
Environmental goods and services	4,853
Landscape services sector	7,000
Waste management and recycling	3,424
Pollution control and sewage disposal	3,582
Environmental protection within business	2,750
Agriculture	45,200
Forestry	1,800
Fishing	900
Mining and quarrying	3,162
Renewable electricity generation	275
Water abstraction	1,265
Defence use	8,248
Public transport	6,426
Tourism and leisure	23,600
Specialist education	200
Total	**117,657**

Source: Valuing our Environment: the Economic impact of the Environment of Wales. (National Trust Wales, 2001, p2).

5.3 Input-Output Tables and Multiplier effects

The National Trust report employed Input-output tables and multiplier analysis to capture the value of the environment to the Welsh economy. Input-Output tables provide a financial picture of an economy, showing domestic and international trade flows between different industries, consumers and government sectors during a particular year. This accounting framework enables inter-industry transactions (sales and purchases) to be mapped and quantified, enabling detailed descriptions of economy interactions, whilst manipulation of these tables allows the effects of changes in that economy to be estimated, via calculation of economic multipliers. [5]

Multiplier effects are a calculation of the economic value of changes in the flows of supply chains in an industry sector. For example, expansion at any point in an industry supply chain will require increased inputs at all points, leading to increased outputs, jobs and increased wage income; some of which will be spent in the local economy thus multiplying economic benefits. The multiplier analysis in the National Trust report

[5] Welsh Input-Output Tables 1996 were the latest available for the National Trust report. New tables were made available in May 2004.

required the environmental sectors presented above to be re-grouped into the nine Standard Industry Classification sectors.

Table 5.2 Direct and multiplier employment from environmentally related activities

	Direct	Multipliers	Total FTE jobs
Agriculture, forestry & fishing	32,685	6,863	39,548
Energy & water	5,896	896	6,792
Manufacturing	17,503	5,555	23,058
Construction	4,188	2,790	6,978
Distribution, hotels & restaurants	22,931	13,371	36,302
Transport & communications	10,026	4,057	14,083
Banking, finance & insurance	3,939	9,339	13,278
Public administration & health	12,987	2,652	15,639
Other services	7,500	6,155	13,633
Total	**117,655**	**51,677**	**169,332**

Source: Valuing our Environment: the Economic impact of the Environment of Wales. (National Trust Wales, 2001, p82).

Table 5.2 shows that from the 117, 655 jobs related directly to environmental activities, a further 51, 677 jobs were supported: an overall multiplier effect of 1.44. That is, for every FTE job in activities related directly to the environment an additional 0.44 of a job was supported in other activities in Wales. Taken together, the 169, 332 environmental and multiplier jobs represented 17% of total employment (964, 000 FTEs) in Wales.

The National Trust report also assessed economic output, GDP, and income to labour from environmentally related activities per annum using multiplier analysis. These data are reproduced below in Tables 5.3 – 5.5.

Table 5.3 Direct and multiplier output from environmentally related activities

	Direct £ m	Multipliers £ m	Total £m
Agriculture, forestry & fishing	1,128	237	1,364
Energy & water	729	194	923
Manufacturing	1,886	589	2.475
Construction	149	99	249
Distribution, hotels & restaurants	706	471	1,177
Transport & communications	419	205	624
Banking, finance & insurance	127	650	778
Public administration & health	705	95	800
Other services	266	197	463
Total	**6,115**	**2,737**	**8,852**

Source: Valuing our Environment: the Economic impact of the Environment of Wales. (National Trust Wales, 2001, p82-83).

The output (turnover) of £8,852m from environmental and multiplier activities was 15% of the £60,707m output from all economic activities for all-Wales in that year.

Table 5.4 Direct and multiplier GDP from environmentally related activities

	Direct £m	Multipliers £m	Total £m
Agriculture, forestry & fishing	332	70	401
Energy & water	102	16	118
Manufacturing	261	84	345
Construction	48	32	80
Distribution, hotels & restaurants	255	168	423
Transport & communications	177	68	245
Banking, finance & insurance	55	153	207
Public administration & health	331	60	391
Other services	82	74	156
Total	**1,643**	**724**	**2,367**

Source: Valuing our Environment: the Economic impact of the Environment of Wales. (National Trust Wales, 2001, p83).

Table 5.5 Direct and multiplier income to labour from environmentally related activities

	Direct £m	**Multipliers £m**	**Total £m**
Agriculture, forestry & fishing	234	49	283
Energy & water	71	12	83
Manufacturing	190	64	253
Construction	39	26	65
Distribution, hotels & restaurants	207	134	342
Transport & communications	137	52	189
Banking, finance & insurance	44	121	165
Public administration & health	237	46	283
Other services	66	60	126
Total	**1,225**	**563**	**1,788**

Source: Valuing our Environment: the Economic impact of the Environment of Wales. (National Trust Wales, 2001, p84).

Environment related income to labour of £1,788 million was 10% of the total £17,794 Welsh income to labour.

5.4 Welsh Input-Output tables 2000

The analysis of the Input-output tables 2000 for Wales (Bryan *et al.*, 2004) have not, to date, included a specific focus on the environment. Some sectors of the economy, such as agriculture and forestry, tend to be regarded as inherently environmentally-related and, indeed, as rural. [6] To bring the latest available data to bear, and to provide comparisons, below we reproduce tables showing gross output, compensation to employees and gross value added [GVA] for the current Standard Industry Classification sectors. [7]

Table 5.6 Gross Output by sector: Wales 2000.

Industry sector	Gross output £m	% of Total
Agriculture, forestry & fishing	1077	1.6
Manufacturing & extraction	22680	33.5
Energy & water	3289	4.9
Construction	3468	5.1
Distribution, retails, hotels	7081	10.5
Transport & communications	3235	4.8
Financial & business services	10010	14.8
Public administration	4489	6.6
Education & health	8356	12.3
Other services	3986	5.9
Total	**67670**	**100**

Totals may not sum due to rounding

Source: Welsh Input-Output Tables for 2000 (Bryan *et al.*, 2004, p16)

[6] The south Wales valleys, while not defined as part of rural Wales, have extensive Forestry Commission plantations.

[7] Under new EU accounting rules, GVA is used rather than GDP as the most appropriate method of representing economic output. There are differences between GVA and GDP concerning taxation.

Table 5.7 Compensation of employees as a percentage of Gross Value Added [GVA]: Wales 2000

Industry sector	Compensation of employees £m	GVA	Compensation as % of GVA
Agriculture, forestry & fishing	178	478	37.2
Manufacturing & extraction	5391	7710	69.9
Energy & water	325	1075	30.2
Construction	739	1320	55.9
Distribution, retails, hotels	2222	3782	58.7
Transport & communications	1063	1536	69.2
Financial & business services	2180	6201	35.2
Public administration	1953	2323	83.2
Education & health	3505	4161	84.1
Other services	1502	2213	67.9
Financial services indirectly measured	0	- 650	Na
Total	**19059**	**30149**	**63.2**

Totals may not sum due to rounding

Source: Welsh Input-Output Tables for 2000 (Bryan *et al.*, 2004, p17)

5.5 Local businesses and the rural eco-economy

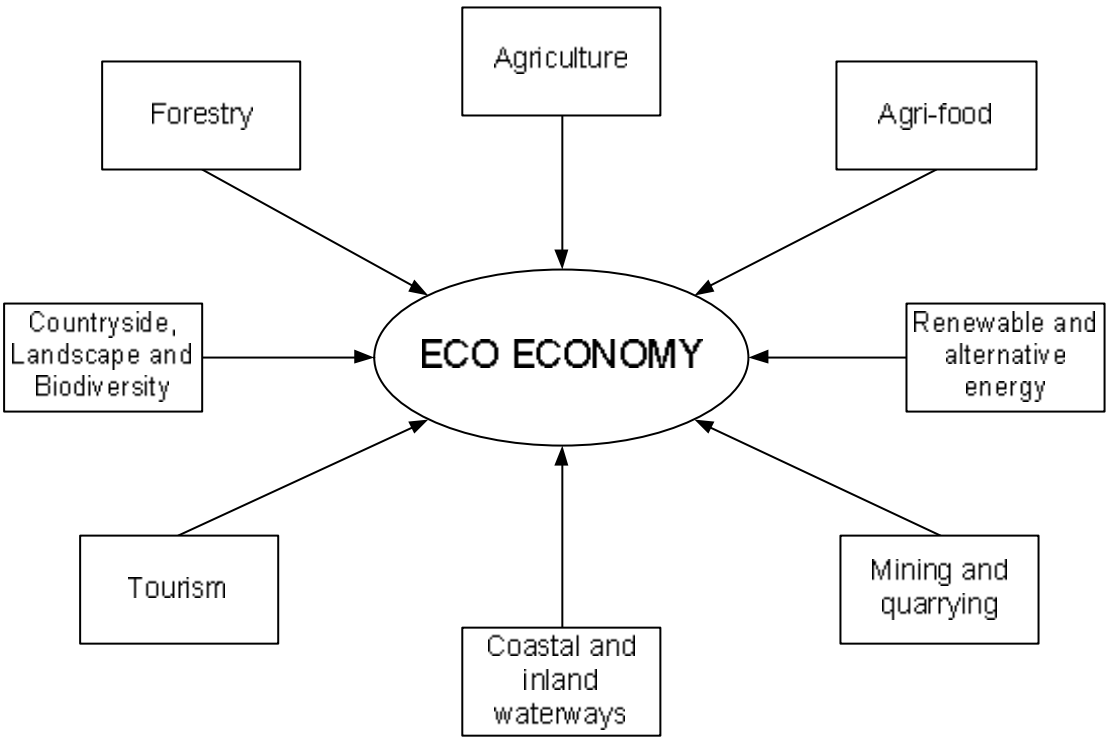
The data above are concerned with the macro-level of the Wales rural economy. For a micro-economic perspective we are able to draw on the recent Rural Business Survey conducted by the Wales Rural Observatory (WRO, 2004). This was a survey that analyzed 1,000 SME respondents in rural Wales. Headline statistics from the survey analysis highlight the importance of the environment and eco-economy to businesses in rural Wales.

- Of the 1,000 respondents, 15% were directly involved with the eco-economy.
- Survey respondents directly involved with the eco-economy included:
  - tourist related businesses
  - agricultural services (farms were excluded from the survey)
  - agricultural and forest machinery
  - saw mills and other timber related businesses.
- The majority of the other businesses surveyed, particularly shops and wholesalers would have benefited from the multiplier effects of eco-related businesses.
- 85% of respondents considered the Wales rural environment to be 'important' or 'very important' for their businesses.
- Of those who provided comments on why the environment was important to their business, 55% gave comments connected with tourism.

As discussed earlier in this report at 5.2, much of the foregoing data are concerned with the wider Wales economy and it has been necessary, in some cases, to infer information about the rural economy. Nevertheless, this descriptive data begins to reveal the

importance of the environment to the economy, particularly the eco-economy of rural Wales. The following sections of this chapter presents data in a sectoral framework. While essentially descriptive these data allow a deeper exploration of the eco-economy, as represented in the diagram at **Fig. 5.1.**

Figure 5.1 Sectors of the Eco-economy of rural Wales



The agricultural labour force fell by 10% between 1998 and 2000, from 62,000 to 55,700. (WAG, 2002a)

Combining data from the draft RDP strategic approach (WAG, 2006d, Annex 1, p6) and Farming Facts and Figures, Wales 2005 (WAG, 2005g) provides a time series for total farm employment:

1992	1994	2002	2003	2004	2005
64,900	63,800	56,300	55,600	57,500	57,500

For the period 1980-1990 the total number of farms remained nearly constant (increasing by a small number) but over the period 1990 - 1999 there was a drop of 4%. Over the same period, however, dairy farm numbers had halved.

	1980	1990	1999
Total no of farms	29,508	29,646	28,410
No of dairy farms	7,705	5,224	3,381

(WAG, 2002a)

More recent data show the total number of farm holdings increasing, while the number of dairy farms continues to decrease (WAG, 2005g). [8]

	2001	2002	2003	2004
Total no of farms	36,220	36,473	35,499	35,855
No of dairy farms	3,364	3,165	3,015	2,901

(WAG, 2005g)

Since 1995 net farm incomes for dairy and livestock farms have declined, and in the period 1998 – 20001 they dropped considerably from £6,600 to £4,100 pa. (WAG, 2002a).

Net farm incomes have, however, increased between 2000/01 and 2001/02, with dairy farms experiencing a 30% increase in income from milk and milk products. However, 2002/03 witnessed weakening prices in the liquid milk market. Table 5.8 shows a time series of Net Farm incomes by Farm type, with forecast figures for 2004/05.

[8] The 2005g data include holdings with small amounts of agricultural activity.

Table 5.8 Net Farm Income by Farm Types – in real terms (deflated by RPI)

Farm Type	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05 Forecast
All farm types	6,500	6,200	5,900	9,500	14,400	15,800	15,600
Dairy	14,500	15,500	13,200	31,000	19,100	18,100	20,000
LFA Grazing Livestock	4,900	3,400	4,000	1,800	12,900	15,900	16,400
Lowland Grazing Livestock	- 1,400	700	800	2,300	9,400	8,900	8,100

Source: Estimates of Farm Incomes, 2004/05 Statistical Release 16/2005 (WAG, 2005h) and WAG (2005g)

Recent data show, however, that the forecasts for 2004/05 were at variance with the provisional results- there was a downturn for all farm types, although dairy improved more than expected. These data are shown below, with forecasts for 2005/06.

Table 5.9 Net Farm Income by Farm Types – in real terms (deflated by RPI) 2004/05 and 2005/06 (www.wales.gov.uk/statistics)

Farm Type	2004/2005 Provisional	2005/2006 Forecast
All farm types	14,600	14,100
Dairy	20,500	19,800
LFA Grazing Livestock	14,300	14,000
Lowland Grazing Livestock	3,900	3,600

The table below shows outputs, inputs, net farm income, cash income and non-farm income for all farm types.

Table 5.10 Farm income for all farm types (www.wales.gov.uk/statistics)

	2003/04 final	2004/05 provisional	2005/06 forecast
Total farm output	90,900	94,000	95,100
Total inputs	75,100	79,400	80,900
Net farm income	15,800	14,600	14,100
Cash income [9]	29,700	31,200	31,000
Total non-farming income	7,400	11,200	n/a
On-farm non-farming income	4,100	5,800	n/a
Off-farm income	3,300	5,400	n/a

[9] Cash income is defined as the cash return to the group of people with an entrepreneurial interest in the business for their manual and managerial labour and all their investments in the business.

Subsidies

Much of farm income is, however, made up by direct subsidies. For example, in 2000 direct subsidy payments at £18,600 per farm were over three times the value of net farm incomes at £5,700 per farm (WAG, 2002a). The forecast for 2004-2005 was that direct subsidies at £19,100 per farm would continue to exceed net farm incomes at £16,100 per farm (WAG, 2005g). [10]

According to 'Farming Facts and Figures, Wales 2005', the total amounts paid to Welsh farmers for the principal grants and subsidies were (all amounts are multiples of £million):

(£ million)	**2001**	**2002**	**2003**	**2004**
Tir Myndd	42.2	38.7	37.1	35.5
Sheep Annual Premium	67.0	90.5	91.4	101.0(a)
Suckler Cow Premium	22.1	28.3	29.7	33.3(a)
Beef Special Premium	23.3	23.8	24.7	30.0(a)
NB. (a) estimated				
Farming Connect Capital Grants	0.3	0.4	1.3	6.1
(WAG, 2005g)				

For 2006 the draft RDP strategic approach (2006d, p1) estimates that 20,000 farms in Wales are in receipt of CAP Single Payments.

Data from the WAG Agricultural Census for 2005 indicate:

The number of farm holdings employing only part-time workers was -	13,304.
The number of part-time farmers was -	22,317 [11]

The draft RDP strategic approach notes that agriculture's contribution to GVA has remained stable, despite the recent rise in total farm income, which comes at the end of a long-term 20 year declining trend. However, the RDP strategic approach suggests that short-term trends in farm incomes should be treated with care, as farm incomes are especially susceptible to movements in prices, exchange rates and shocks such as the recent BSE and foot and mouth crises.

Environmentally friendly farming

Although agriculture has been, and remains, a major factor in the rural economy, with farmers historically claiming to be the 'stewards of the countryside', intensive farming practices in the late twentieth century raised questions concerning the effects of agriculture on the rural ecology. Agri-environmental schemes such as Environmentally Sensitive Areas, introduced in 1987, afforded opportunities for agriculture to be re-

[10] £16,100 is net income for 'all farm types' (i.e. including hobby farmers and other holdings) cf £15,600 for 'all dairy and livestock' at Fig. 5.8.

[11] Data are not available for the number of farms that are pluriactive or diversifying.

integrated with the eco-economy. Put broadly the aims of agri-environmental schemes are to maintain and often to enhance the conservation, landscape and historical value of the key environmental features of an area, and, where possible, improve public access to these areas, through grant payments to participating farmers and land managers.

In Wales, Tir Gofal, introduced in 1999, has taken over from the existing schemes such as Environmentally Sensitive Areas and Tir Cymen, which was the Wales entry-level agri-environmental scheme. Tir Gofal operates under the CAP agri-environment measures, jointly funded by the European Union and the UK Government. Tir Gofal is a whole farm agri-environment scheme for Wales, which encourages farmers throughout Wales to maintain and enhance the agricultural landscape and its wildlife and to provide new opportunities for people to visit the countryside. There are now over 1600 Tir Gofal agreements across Wales covering an estimated 160,000 hectares.

In 2005, Tir Cynnal, a new entry-level agri-environmental scheme, was introduced. It is estimated that by 2007 there will be 10,000 participants in Tir Cynnal, and that, together with Tir Gofal, 80% of farmed land in Wales will be managed under an agri-environmental agreement (WAG, 2006d, p14).

Table 5.11 Total payments for agri-environmental schemes

Environmentally Friendly Farming - Total Payments (£ million)

	2001-02	2002-03	2003-04	2004-05
Tir Gofal	5.7	11.1	13.4	16.9
Organic Farming Scheme	1.6	2.5	2.7	1.9
Other Environmental Schemes	13.5	10.8	6.3	5.4

Source: Wales in Figures, Farming Facts and Figures, 2005 (WAG, 2005g)

In addition, a range of activities and projects to enhance and protect the natural environment have been funded with EU money, under Objective 1, Priority 5, Measure 7: A Sustainable Countryside – enhancement and protection of the natural environment and countryside management.

Table 5.12 Objective 1 Funding – Priority 5, Measure 7

Funding	Total funds Available £(000)s.	Committed to Date £(000)s.	Projects under Appraisal
	£23, 054	£21, 323	£0

Outputs		Target	Forecast to Date
	Activities		
	Access management projects	300	283
	Land management projects	1,500	1,595
	Resource management (including energy, water and waste management) projects	20	108
	Results		
	Km of managed access in the countryside	1,100	610
	Ha brought under sustainable management	33,000	44,382
	Km of traditional boundary created or renovated	1,000	392
	No of land managers adopting comprehensive pollution and waste management systems	0	2
	No of land managers adopting energy efficiency and conservation measures	400	353
	Gross jobs created	100	111
	Ha of buffer zones managed alongside water	50	67
	Courses		
	Land managers adopting agricultural water resources management	20	61
	Gross safeguarded jobs	500	181

Background

42 projects have been approved throughout the Objective 1 region covering a wide range of environmental enhancement and management objectives, including water quality management, conservation measures and access management.

Source: www.wefo.wales.gov.uk – January 2006

Prospects for Agriculture in Wales

Looking forward, the RDP strategic approach argues that Welsh agriculture is inherently disadvantaged due to factors such as small scales of production and long distances from the major markets. In addition, it points to a general lack of integration within Welsh agriculture, with few examples of sustained co-operative activities and a low allocation of final product prices to primary producers and local economies. The 2005 CAP reforms are another major factor, requiring Welsh agriculture to adjust to fundamental changes in direct support mechanisms through the Single Payment regime and the full decoupling from production. To meet these challenges the RDP strategic approach calls for industry restructuring to meet market requirements and customer preferences.

5.7 Sector: Agri-food

One way forward for agriculture is through the development of the agri-food sector. From 1999 to 2006 the strategic direction of the Wales agri-food sector has been the responsibility of the Agri-food Partnership and the Welsh Development Agency [WDA]. Headline statistics for the sector indicate:

- Total output for 2001 of £2, 048 million.
- GVA was £696 million.
- Exports worth £150 million.
- 22, 900 people were employed in food processing for 2001.
- 64% of firms employed 1 - 10 people.
- 6% of firms employed more 200 people.

Source: Strategy in Action: Towards 2007. (Agri-food Partnership, 2004)

To further develop the agri-food sector in Wales, WAG have established 'Food Centres of Excellence' at UWIC Food Industry Centre in Cardiff; the Food Centre Wales based at Horeb, Ceredigion; and the Food Technology Centre at Coleg Menai.

5.8 Sector: Forestry

Although the National Trust (2001) and Bilsborough and Hill (2003) categorize forestry as an industry that makes extensive use of natural resources, recent developments in sustainable forestry policy and practice, particularly by Forestry Commission (Wales) [FC(Wales)], have pointed to forestry's potential to contribute to and enhance the environment and ecology. These developments seek to emphasize forestry's role in economic, social and environmental sustainable development through both traditional forest industries and non-timber, socially-oriented activities such as recreation, education and tourism. Forestry has, then, significant roles to play in the economic, industrial, sustainability and ecological future of Wales (e.g. WAG, 2001).

The following data and tables provide an assessment of the scope and value of forestry in Wales.

Table 5.13 Area of forest and woodland

Hectares	Conifers	Broadleaves	Total area
FC (Wales)	98,000	12,000	110,000
Non- FC	64,000	112,000	176,000
Total	**162,000**	**124,000**	**286,000**

Source: Forestry Facts and Figures (Forestry Commission, 2004)

FC (Wales) is the principal manager of woodlands in Wales, with 38% of total woodlands, and their estate, which FC (Wales) manages on behalf of WAG and the Welsh nation, is divided into four administrative units. Coed y Gororau (north east and mid-Wales); Coed y Myndd (north west and mid-Wales); Coed y Cymoedd (south east Wales); and Llanymddyfri (south-west and mid-Wales). In addition, FC (Wales) manages other land. FC (Wales) holdings are shown below.

Table 5.14 FC (Wales) holdings

Hectares	Woodland/Forest	Other land	Total
Coed y Gororau	18,883	1,940	20,823
Coed y Myndd	32,315	5,921	38,236
Coed y Cymoedd	26,148	4,401	30,549
Llanymddyfri	32,377	3,706	36,083
FC (Wales)	**109,722**	**15,969**	**125,691**

Source: Digest of Welsh Local Statistics (WAG, 2004, p222)

Forestry and woodland cover 13.8% of the total land area for Wales (20, 802 square kilometres), and 16.8% of rural Wales (17,074 square kilometres). [12] Approximately 50% of the broadleaf woodland in Wales is classified as ancient woodland of particular conservation value (National Trust, 2001, p47).

The economics of (industrial) forestry in Wales

Munday and Roberts (2001), drawing on the Welsh Forestry Multiplier Study (Welsh Economy Research Unit, 1999), assess the economic characteristics of forestry-related sectors:

Table 5.15 FTE employment and output of forestry related sectors in Wales

Sector	All forest sectors	Private estates	Harvesting and allied contracting	Sawmills	Panel board and paper	Haulage
FTEs	3281	728	846	557	936	215
Gross output (£000s)	403,444	16,533	43,474	47,253	286,837	9352

Source: Munday and Roberts (2001, p341)

The draft RDP strategic approach (WAG, 2006d) estimates the value of forestry's contribution, including tourism, through both state and privately owned woodlands, to the rural economy as in excess of £30 million per annum.

The Forest Employment Survey 1998, which was published in 2001, gave an employment breakdown under different categories.

[12] See Footnote 3. Coed y Cymoedd Forest District includes the south Wales 'valleys', which have extensive forests but are not defined as rural.

Table 5.16 Forest employment (FTE) in Wales

Activity	Wales
Forest nurseries	2
Establishment	252
Maintenance	380
Harvesting	493
Road construction	47
Other forest	144
Total forest	**1318**
Haulage	142
Processing	2192
Other non-forest	447
Total Non-forest	**2781**
Total	**4099**

Source: Forestry Facts and Figures 2004 (ONS, 2004)

More recently, and as part of their sustainable development agenda, FC (Wales) conducted a survey entitled 'Public Opinion of Forestry 2005: Wales'. Headline statistics from the survey report further indicate the value of forestry to the rural eco-economy.

- 88% of respondents selected at least one benefit that local woodlands provided. The most named benefits concerned wildlife, landscape and recreation.
- 50% had been shopping for wood products in the last few years.
- 23% stated that they were more likely to buy a wood product labelled as Welsh than another similar product.
- 11% used wood as a domestic fuel.
- 69% had visited woodlands in the last few years – important factors when visiting woodlands were:
    - Peace and quiet (56%)
    - Attractive scenery (54%)
    - Wildlife (47%)
    - Close proximity of woodlands to community (43%)

Other contributions that FC (Wales) is making to the eco-economy include:

- Plans for partnerships with local communities for sites for renewable energy.
- Pilot partnerships with local communities in the management of local forests, such as Brechfa Forest and Long Wood, which is near Lampeter.
- A range of partnership projects with local communities.
- Participation in Intermediate Labour Markets.
- Plans for forest-based Intermediate Labour Markets.
- World-class commercial mountain-bike trails such as Glyn Corrwg, Afan Argoed and Coed y Brenin.
- An extensive range of forest parks and tourist trails.
- Robinwood - a three year European Interreg IIIc Regional Framework Operation project looking at how woodland can provide new jobs by generating extra incomes for businesses in rural communities across Europe.

5.9 Sector: Countryside, Landscape and Biodiversity

The development and health of the beautiful Welsh countryside, landscapes and biodiversity are, of course, intrinsically linked to both agriculture and forestry, and constitute natural resources for the eco-economy with specific linkages to the tourist sector, for example Natura 2000 sites. In addition to the agri-environmental schemes, discussed above, designed to enhance these valuable assets a range of other measures are in place to further protect them. These measures include a number of Statutory Designated Areas:

- 3 National Parks:
  - Snowdonia
  - Brecon Beacons
  - Pembrokeshire Coast
- 5 Areas of Outstanding Natural Beauty (AONB):
  - the Gower
  - Clwydian Range
  - Llyn
  - Wye Valley
  - Yns Mon (Anglesey)
- 900 Sites of Special Scientific Interest (SSSI)
- 62 National Nature Reserves

In addition, the National Botanic Garden of Wales in Carmarthenshire is an asset that provides both scientific and tourist interest.

With respect to biodiversity, Wales has a wide range of natural habitats with 30% of its land area and 70% of its coastal and marine environment designated as high wildlife value and conservation importance at European level (WAG, 2006d). The Wales Biodiversity Partnership coordinates Wales's actions under the UK Biodiversity Action Plan.

The National Trust Wales

Cutting across the countryside, landscape and biodiversity sector, and with strong linkages to tourism, is the work of the National Trust Wales. Earlier in this report we drew on data from Valuing the Environment (National Trust, 2001) – more recent National Trust research (National Trust Wales, 2005a, p2) estimates that:

- the historic environment of Wales had a total impact of around £780 million.
- the historic environment of Wales supported over 22,500 jobs.
- sites based on history and heritage made up to approximately 80% of the most visited attractions in Wales.

More specifically the National Trust Wales have entered into a range of projects concerned with the eco-economy of rural Wales. Two examples are drawn on here.

- First, we provide outline data from the Socio-economic impact assessment of the project to restore the Llanerchaeron Estate and open it to the public. The

Llanerchaeron Estate is a small estate near Aberaeron in Ceredigion. It was in a dilapidated condition, but following extensive surveys the National Trust began a major project of work in October 1999. Key to this project were a £2 million Heritage Lottery fund Grant and £1.5 million in grants from Objective 5b, Objective 1 and Cadw. As a part of the project, a socio-economic impact assessment was conducted using questionnaires and interviews with target groups. The socio-economic impact assessment (National Trust Wales, 2005b) found that:

- There was a substantial local economic contribution by the National Trust to the Aberaeron area. [13]
- 103 local businesses benefited substantially, with 70% of a sample reporting increases in turnover and operating profit, and greater marketing opportunities.
- When the property first opened, although not a full season, visitor numbers at 34,000 were above the initial target.
- It was estimated that £3,523,000 in gross income had flowed to the local economy.

The second National Trust Wales project to undergo a Socio-economic impact assessment was the Nantgwynant Integrated land Management Project. Nantgwynant is an area located on the southern side of Snowdonia, running along the Glaslyn River valley. The National Trust acquired the Craflwyn Estate in Nantgwynant in 1994 and with Objective 5b funding repaired parts of the dilapidated estate and established an education centre. Then, in 1998, with the aid of a public appeal, the National Trust were able to purchase 4,000 acres of land in the Snowdonia National Park. With a significant landholding in the area, the National Trust devised the Nantgwynant Integrated Land Management Project, which aims to establish partnership working between local communities and other stakeholders to work towards sustainable development through restoring and maintaining the local environment, so creating a thriving local economy. Outline data from the Socio-economic impact assessment (National Trust Wales, 2005c) indicate that:

- 22 FTE jobs are supported locally.
- In 2003-2004 there were an estimated additional 17,592 visitors to the area.
- 121 local contractors were employed on the project.
- Gross income of £2, 9550,115 had flowed to the local economy.
- Local partnerships have been established to support the regeneration work in the area.

A third, in-progress, National Trust Wales project, at Dynefwr in Carmarthenshire is the subject of a case study in Chapter 6 of this report.

5.10 Sector: Tourism

Tourism is one of the fastest growing activities in the Welsh economy. In outlining the scope of tourism in Wales, however, one must be aware of the fault-line caused by the

[13] The National Trust report defined 'local' as within 25 miles.

Foot and Mouth [FMD] crisis of 2001 (Scott *et al*, 2004). The first sets of data below, relate to tourism some years before FMD.

Tourism is especially important for rural Wales, which attracts twice as many visitors and generates nearly four times as much money from tourism as non-rural Wales (WAG, 2002a).

Table 5. 17 Tourist visits and money spent by tourists by local authority 1997-99

Local Authority	Tourist visits (millions)	Tourism spend £m
Anglesey	0.5	59.7
Carmarthenshire	0.3	38.5
Ceredigion	0.6	73.3
Conwy	1.0	133.4
Denbighshire	0.8	97.1
Gwynedd	1.6	201.5
Monmouthshire	0.3	28.8
Pembrokeshire	1.1	182.6
Powys	0.8	72.1
Total – Rural Wales	**7.0**	**887.0**
Rest of Wales	3.2	233.0
Total Wales	10.2	1120.0

Source: 'A statistical focus on rural Wales' (WAG, 2002a)

Table 5. 18 Money spent by tourists (including day visits) by local authority 1997-99

	All Tourism Spending (£m)
Anglesey	80
Carmarthenshire	60
Ceredigion	110
Conwy	190
Denbighshire	140
Gwynedd	285
Monmouthshire	50
Pembrokeshire	260
Powys	105
"Rural Wales"	**1208**

Source: Quinquennial Review of the Wales Tourist Board Interim Report (WAG, 2002)

Table 5.19 Employment in tourism-related industries 1997-99

	Full time (000s)	Part time (000s)	All (000s)	FTEs	Percentage of all FTEs in tourist-related employment
Conwy	2.8	2.4	5.2	4	15.7
Gwynedd	2.9	2.4	5.3	4.1	11.8
Pembrokeshire	2	1.5	3.5	2.8	11.5
Ceredigion	1.1	1	2.1	1.6	9.5
Denbighshire	1.7	1.3	3	2.4	9.2
Powys	2	1.8	3.8	2.9	8.8
Isle of Anglesey	0.7	0.8	1.5	1.1	8.5
Monmouthshire	1.1	1.7	2.8	2	8.3
Carmarthenshire	1.7	1.6	3.2	2.5	6.7
Wales	**38**	**34.1**	**72.1**	**55.1**	**6.5**

Source: Quinquennial Review of the Wales Tourist Board Interim Report (WAG, 2002)
NB: Data for non-rural authorities are not shown

Employment-based estimates of tourism's value to the economy are criticized by Bryan *et al.* (2004, p16) in their analysis of the Welsh Input-Output Tables for 2000; they argue that such approaches treat tourism as an industry, but that tourism is a demand side event rather than an industry. Tourism, Bryan *et al.* continue, is not an industry-specific activity demanding goods and services from across the economy, and employment based approaches fail to account for tourist dependent employment and spend in 'non-tourist' related sectors, such as retail. Bryan *et al.* suggest that Tourism Satellite Accounts [TSA] (see also Jones *et al.*, 2003) bring the necessary complexity to assessments of tourism's value. TSAs are constructed as satellites of the overall Input-Output national accounting framework and built around ten constituent tables:

1. Inbound tourism expenditure.
2. Domestic tourism expenditure.
3. Outbound tourism expenditure.
4. Domestic 'tourism final consumption'.
5. Production of tourism commodities.
6. Domestic supply and consumption by product.
7. Employment and labour use.
8. Tourism Fixed Capital formation (investment).
9. Tourism Collective Consumption.
10. Non-monetary indicators

Source: Bryan *et al.* (2004, p34) Welsh Input-Output Tables.

Using the TSA accounting framework Bryan *et al.* produced the following data.

Table 5.20 Tourist consumption in Wales, 2000

Tourist Type	£million
Welsh residents staying in Wales	241.9
Visitors from the rest of the UK	1402.5
Visitors from the rest of the world	267.3
Day-trippers	1506.8
Total tourism expenditure	**3418.6**
Of which: • Welsh sourced goods and services • Imports from outside Wales • Taxes on products	 • 1976.3 • 1124.4 • 317.9

NB. There is a small rounding error.

Source: Welsh Input-Output Tables for 2000 (Bryan *et al.*, 2004, p35)

Data for business size show that tourist-related businesses accounted for nearly 10% of businesses in Wales. Table 5.21 shows numbers and proportions of business units in Wales.

Table 5.21 Tourist-related business units by employee numbers 1997-99

Employment size band	Tourism-related industries Number of local units	Percentage of total
<10	2,369	59.2
11 -20	911	22.8
21-50	519	13.0
51-75	110	2.8
76-100	50	1.3
101-250	32	0.8
>250	9	0.2

Source: Adapted from Quinquennial Review of the Wales Tourist Board Interim Report (WAG, 2002)

Tourism since the Foot and Mouth crisis

As indicated, the foregoing tourist data relate to the period before the FMD outbreak in 2001, which had a particular effect on rural tourism across the UK (Scott *et al*, 2004). To address the problems caused by FMD in Wales, in April 2002 CCW launched 'Adfwyio Cefn Gwlad – Rural Recovery for Tourism': a £5.2 million match-funding grant scheme to stimulate economic recovery following FMD. The aims of Adfwyio were to assist projects that integrated tourism business with open air recreation, leisure and the environment – to:

- Help tourism businesses integrate outdoor recreation and enjoyment of the countryside and coast with a better understanding and appreciation of our natural

environment and the historic and cultural character of rural communities.

- Improve or provide new opportunities for outdoor leisure, public access and accessibility for all people to woodlands, water space and the wider countryside and coast.

Funded by WAG and managed jointly by CCW and the Wales Tourist Board (WTB), with additional support from the Forestry Commission (FC), Adfywio was scheduled to run for two years, ending March 2004, but the scheme was such as success, and demand for funding so high, that it closed to new bids ahead of schedule. To December 2003, 192 projects had been awarded grant of just over £5.07 million. It is estimated that the total investment in Wales stimulated by this grant was £13.4 million.

It is then, instructive to compare the pre-FMD data above with 2004 data, issued by WTB. Data are for all-Wales.

www.wtbonline.gov.uk and www.industry.visitwales.co.uk

	2004	**1997-99**
Tourist visits (millions)	9.913	10.2
Tourist spend (£million)	1803	1120
Employment (000s)	90	55.1
% of total workforce employed	9%	6.5%

Other headline statistics from WTB (www.industry.visitwales.co.uk) show that:

- Tourists spend over £8 million a day on trips in Wales.
- This amounts to around £3 billion a year.
- WTB's baseline budget for 2005/2006 is £22.6 million.
- In direct terms, tourism contributes 3.7% of whole-economy value added in Wales. It is important to note that this figure does not include indirect value added that occurs.
- Approximately 100,000 people in Wales are employed in tourism. This represents approximately 9% of the workforce.
- UK residents account for 93% of tourism trips to Wales.
- 70% of UK tourists to Wales come for a holiday, 20% to visit friends or relatives and 7% for a business trip.

- Over one million trips are taken to Wales annually by overseas tourists. The most popular origins of overseas visitors are Republic of Ireland, USA, and Germany.

- 50% of trips by UK tourists to Wales go to the countryside or small towns/villages.

- The most popular activities undertaken by tourists in Wales are: walking, swimming, visiting historic attractions such as castles and visiting museums and galleries.

- The most popular attraction in Wales is the Museum of Welsh Life which attracts over 600,000 visitors annually.

- In serviced accommodation in Wales, there are over 80,000 bed spaces available.

The WTB has vigorously promoted tourism , including activity tourism, through a wide range of strategy documents including 'Best Foot Forward' (WTB, 2005).

5.12 Sector: Coastal and inland waterways

Forward planning under the Water Framework Directive [WFD] of the European Commission is underway. This EU Directive came into force on 22 December 2000. Defra has responsibility for establishing policies under WFD, while the Environment Agency has responsibility for their implementation. WFD establishes a framework for the protection of inland surface waters, coastal waters, and groundwater, in order to prevent and reduce pollution, promote sustainable water use, protect the aquatic environment, improve the status of the aquatic ecosystem, and mitigate the effects of floods and droughts. Three River Basin Districts have been established in Wales: the Severn, the Dee and the river systems of west Wales.

The coastal and inland waterways are, of course, an important sector of the eco-economy of rural Wales. Sections 3.1.226 – 3.1.227 of the RDP consultation draft (WAG, 2006e) provide key statistics:

- The value of angling visits to rural and coastal Wales is in excess of £80m pa.
- The above value has the potential to increase to £120m pa.
- 240 salmon and trout rivers.
- More than 20 large reservoirs.
- Several hundred natural lake fisheries.
- Over 200 small stocked still water fisheries.
- 150 kilometres of canals.
- 1200 kilometres of coast.
- 300 charter boats.

A joint initiative by the Environment Agency and the Welsh Tourist Board, funded by WAG, and entitled 'The Fishing Wales' project is aimed at developing fishing tourism. (www.fishing.visitwales.com).

The Draft RDP strategic approach (WAG, 2006d) notes the minor role played by the Welsh fisheries industry – outline statistics indicate:

(a) 1,000 full-time employees in the fisheries industry.
(b) 400 part-time employees in the fisheries industry.
(c) The aquaculture industry (mussel and other shellfish beds) is valued at £10 million pa.
(d) In 2001, 19,700 tonnes of fish worth £15.6 million were landed.
(e) In 2002, 17,795 tonnes of fish worth £14.5 million were landed.
(f) In 2002, the industry produced 268 tonnes of rainbow trout, and 23 tonnes of brown trout.

Sources: (a) – (c) Draft RDP strategic approach (WAG, 2006d)

(d) - (g) Strategy in Action: Towards 2007. (Agri-food Partnership, 2004)

Wales also has the first major integrated land-based marine fish farm in Europe. This is designed to produce halibut to a level that will allow the development of the first fully sustainable fish processing plant in Wales (WAG, 2006d, Annex 1, p41).

In addition, much of the EU funding, under Objective 1, Priority 5, Measure 8: Support for Recreational Opportunities and Management of the Natural Environment has been directed towards inland and coastal waterways-related projects – as indicated at Table 5.22.

Table 5.22 Priority 5 Measure 8: Support for Recreational Opportunities and Management of the Natural Environment

Funding

Total funds Available (£000s)	Committed to Date (£000s)	Projects under Appraisal
£15.595	£15.949	£0

Outputs

Activities	**Target**	**Forecast to Date**
No. of coastal management schemes supported	25	22
Kms of riverine habitat improved	450	368
Visitor initiatives supported	140	151
Inland fisheries projects	41	39
Results		
Gross new jobs created	800	317
Gross safeguarded jobs	1,350	1,367

Background

33 projects have been approved throughout the Objective 1 region covering a wide range of recreational opportunities and environmental management.

Source: www.wefo.wales.gov.uk – January 2006

5.13 Sector: Renewable and alternative energy

With some of the best wind and water resources in Europe, Wales is in a good position to develop clean and sustainable energy, and at the core of WAG 's future energy policy is the stated aim for Wales to become 'a global showcase for clean energy by 2010' (Technical Advice Note 8, Annex A, p23). The UK Energy White Paper sets a target of 15% renewable energy to 2015 – WAG has set the following targets in Technical Advice Note [TAN] 8 [14] :

- 4 TWh per annum renewable electricity production by 2010. [15]
- 7 TWh pa by 2020.
- 60% carbon savings by 2050.

The installed renewables capacity required to meet the 2010 target of 4 TWh pa is 1500 MW. Current capacity is 450 MW, comprising onshore and offshore wind generation, and biomass and hydro-electricity. Taken together this generates 1.4 TWh pa.

The requirement to meet target is for:

- 2.6 TWh pa additional electricity production, which equates to;
- 900 – 1000 MW additional renewable generating capacity.

WAG propose that this additional renewable generating capacity and power requirement will be met from the following sources:

- 800 MW from large-scale (> 25 MW) onshore turbines sited on strategic developments
- 200 MW from new offshore turbines at Scarweather and Rhyl Flats.
- A smaller contribution (0.1 TWh, 40 MW) from other sources such as biomass.

Source: TAN 8 Annex A

TAN 8 observes that onshore wind farms, biomass electrical plants fuelled by wood wastes and small scale hydo-electrical plants are, even now, commercially competitive, and that in the future offshore wind and biomass electrical plants fuelled by energy crops are predicted to become commercially competitive. [16] Looking beyond the 2010 target, technologies such as wave and tidal systems may have a role to play, and the WAG First Minister suggests that the Severn Barrage, with the second largest tidal range in the world at around 14 metres, has considerable potential. [17]

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[14] kW = 1,000 watts (10^3): MW = 1,000 kW (10^6); GW = 1,000 MW (10^9); TW = 1,000 GW (10^{12})
TWh = One terawatt (TW) for one hour.

[15] Just over 20% of annual Welsh electricity demand in Wales - figure based on 2002 UK per capita electricity consumption – (Friends of the Earth Cymru, 2004)

[16] The Renewables Obligation provides for support for some of these types of scheme.

[17] The largest tidal range in the world is the Bay of Fundy, which separates Nova Scotia from New Brunswick, Canada and Maine, USA.

Windfarms are, of course, very visible and tend to be controversial, but TAN 8 points to the opportunity for community benefits through contractual partnership arrangements between power developers and local communities. TAN 8 gives details of three current schemes in Wales: Carno in Powys; the Power Factory in Rhondda Cynon Taff; and Ail Wynt, Moel Maelogen Windfarm in Conwy. There are also examples of small-scale community-owned wind turbines, such as Glantwymyn, Powys. This turbine is on FC land, and is one of the case-studies in Chapter 6 of this report.

With respect to biomass, the RDP strategic approach points to the development of markets for energy crops through a range of projects: capital grants for SMEs for woodfuel burning equipment; research on energy crops such as willow; assistance to growers of Short Rotation Coppice; and support for farmers to grow energy crops on set-aside land. The RDP strategic approach also observes that after 2009, an increasing percentage of the biomass used for co-firing power stations must come from energy crops to qualify for Renewable Obligation Certificates. With these growing markets in mind WAG is considering the options for financial support to growers of energy crops (WAG, 2006d). It should be noted that in recent months there have been a number of media reports concerning a range of locally-based alternative energy schemes.

5.14 Sector: Mining and quarrying

Coal mining continues on a reduced scale in south Wales, with three underground mines and nine open-cast pits, many of which, as mentioned above, are located on FC land. In addition there are a number of quarries in stone, slate, sand and gravel. Employment in mining and quarrying includes:

- 1,185 jobs in coal mining.
- 712 jobs in stone quarrying.
- 1,029 jobs in sand and gravel extraction
- Llechwedd Slate Caverns continue to operate as a slate mine and also attracts 160, 000 tourist visitors per annum.

Source: National Trust (2001, p55)

Mineral extraction tends to be thought of as an environmentally damaging activity. There is, however, the potential for planning gain with modern planning permissions demanding environmentally sensitive reinstatement. In addition, some abandoned workings have evolved into sites of geological and biological interest, with some included in the 400 Geological Conservation Review sites in Wales (National Trust, 2001, p56).

5.15 Summary of Sectoral Data

To a certain extent this presentation of data, much of which is concerned with grants and subsidies, on the basis of eight key sectors is symbolic of the prevailing vertical approaches of both business and policy to the rural economy. We suggest that integrative approaches are required; lateral and horizontal approaches that explore potentialities and exploit synergies between the different parts of the eco-economy of rural Wales. To start to explore these potentialities and synergies the following chapter of this report consists of six case-studies of enterprises embedded in the eco-economy of rural Wales.

6. THE ECO-ECONOMY OF RURAL WALES: CASE-STUDIES

6.1 BRO DYFI COMMUNITY RENEWABLES LTD

COMMUNITY WINDTURBINE

Image courtesy of the Energy Saving Trust

This outline of the community windturbine at Cilgwyn, Pantperthog, in the Dyfi Valley of mid Wales draws extensively on papers provided by Andy Rowland, the manager of Eco Dyfi - the community regeneration organization for the area. Acknowledgements and thanks are given at this juncture; for details of the papers see the 'References' at the end of this report. Eco Dyfi is:

" Formally the Dyfi Eco Valley Partnership and we have been established since 1998 and our mission is the sustainable community regeneration of the Dyfi Valley. So from one point of view we are a body that is working for sustainable development and so we have a close regard to the international dimensions

- the underdeveloped world and global justice - and we have a close eye on intergenerational justice issues of what are we leaving to our future generations. We are also trying to deliver local benefits. That's where we started really was coming from the kind of global aspects with climate change. In 2002 we had a review, we are still engaged in much the same subject matter, but we are starting from the other end - we are saying what are the local needs of the community and how can we meet some of those needs in a way which also contributes to global solutions and contributes to sustainable development?"

History

Since April 2003 the first wind turbine in the UK to be established and owned by the community has been producing pollution free energy in the Dulas Valley. The 75 kW turbine, named Pwer Pobl – People Power, is located on Forestry Commission land at Pantperthog, just above the Centre for Alternative Technology [CAT]. It is owned by Bro Dyfi Community Renewables Ltd [BDCR], a community-owned and run wind energy co-operative based in the Dyfi Valley.

The project had a number of drivers. Firstly, during 1998 – 2001 Eco Dyfi were engaged in a Community Based Renewable Energy Project:

"…a specific European funded project under Objective 5B, with the premise that it's possible to engage local communities in what is an apparently complex subject of energy generation and supply and consumption."

Eco Dyfi identified energy production and consumption in the area as a case of what the New Economics Foundation terms 'leaky bucket' or 'plugging the leaks', with approximately £4 million per annum spent on energy by the 12,000 people in the Dyfi Valley, which, as it was paid to utilities, leaked directly out of the local economy.

"If you can identify the flows of money out of the economy and try and stop some of them…. so the strategy in this case is firstly how can we reduce our energy use and therefore spend less money on energy and therefore have more in our pockets to spend on local goods if we choose. And secondly, which is what this project was aimed at, how can we spend some of that expenditure on energy on local suppliers rather than UK suppliers. So if we're going to buy from the local farmer, say, then that farm will have more money in their pocket. They can then spend locally and so it will circulate longer in the local economy."

Two significant events then occurred within a short time of one another. An individual moved into the area, who was an enthusiast and an expert in community wind energy. She became one of the prime movers of the project. Then the Centre for Alternative Technology [CAT], which is based in Machynlleth, recognized a need for more renewable generation for its own site, to provide energy for its expanding operations. Through Eco Dyfi, a model was formulated whereby the community raised the funds and built the generator – electricity generated is sold to CAT.

"From CAT's point of view it is a good demonstrator as well - also enabling a community group to set up generation."

In this operational model, community members buy shares in an Industrial and Provident Society named Bro Dyfi Community Renewables Ltd [BDCR], which was established in 2001 to explore and create opportunities for the local community to

benefit from wind energy projects, and to provide a legal identity with limited liability. The initial share offer proved so popular that the maximum investment was restricted to £1,000, with a minimum of £100. With support from Eco Dyfi and from the Powys Energy Agency, the project secured funding support from the European Regional Development Fund, the Energy Saving Trust and the Scottish Power Green Energy Trust.

All pre-development work and work on the environmental assessment to accompany the planning application was carried out by members of the partnership in kind, which was rewarded with nominal shares in the project once it was operational. In April 2001, planning permission was submitted, and granted in July 2001. The share offer and the raising of finance for the project took place in October and November 2001. Construction contracts were then placed; a turbine selected and purchased; and construction of the project commenced in April 2002. The turbine was installed in July 2002; connected to the national grid; and fully commissioned in April 2003.

BDCR have a 15 year power purchase agreement with CAT for all of the windturbine output. The turbine supplies electricity directly to CAT and all excess electricity produced exported to the National Grid. The annual electricity production is predicted to be approximately 163500kWh/year and to supply approximately 45 households in the local area with green electricity. Annual income is approximately £6,500 pa (depending on production) and the annual costs are approximately £2,300 pa. The anticipated rate of return over 15 years is 8.44%. Part of the income generated by the project goes into an Energy Conservation Fund, which is jointly managed by BDCR, CAT, Eco Dyfi and Glantwymyn Community Council. The fund supports initiatives to promote energy efficiency in the area.

BDCR (2003) provides a fact summary for the windturbine:

- Owned by Bro Dyfi Community Renewables Ltd (BDCR) - an Industrial and Provident Society (one vote per shareholder).
- 59 shareholders, including Baywind Energy Co-operative and the Energy Saving Trust (EST). The others are individuals, who between them invested over £23,000 in the project.
- All bar three of the individual shareholders live in the Dulas or Dyfi valleys.
- 11 of them earned their shares by working on the project during either the planning or construction phases.
- The minimum shareholding was £100 and the maximum had to be reduced to £1,000 so that everybody who applied could buy some.
- Those who leave their investment in for a 15 year term hope for an 8% rate of return.
- Second hand Vestas V17 turbine and tower bought from Denmark (where many wind turbines are being replaced with larger ones).
- 22 metre tower and a rotor diameter (all the way across) of 17.5 m.
- Maximum output of 75 kilowatts.
- Output enough for nearly 50 households (average household consumption is 0.5 kW continuous, so that would be 75 x 2 = 150, but the capacity factor of 30% brings it down to 45 houses i.e. average output is 30% of the maximum capacity).
- Projected annual output is 163 megawatt hours (163,000 units).
- This amount of electricity would release 70 tonnes of climate-changing carbon

dioxide into the atmosphere if generated using fossil fuels.

- The dividends from EST's shares will go into a Community Energy Saving Fund and be spent on practical measures to reduce energy use locally. This means that further CO2 savings (probably another 345 tonnes) can be made and that people will spend less on energy.
- The Fund will be managed jointly by representatives of BDCR, ecodyfi, the Centre for Alternative Technology (CAT), Glantwymyn Community Council and Powys Energy Agency.
- In practice, the power will all be sold to CAT.
- They will use about 20% of this on site and sell the rest. They can sell the Renewables Obligation Certificates as well (public suppliers need to buy these if they aren't generating enough electricity from renewable sources themselves to meet the government's instructions).
- This surplus will power local houses, although the householders will pay their existing suppliers in the normal way. The structure of the electricity industry and its regulation make it prohibitively expensive for a small generator like this to actually sell the power to several different local customers.

Finance and Grants

In December 1999, a grant application was successfully submitted to Eco Dyfi for 30% funding of the anticipated capital costs. The total cost of the project was £81,500 of which £44,000 came from grant funding (ERDF Objective 2, Energy Savings Trust and Scottish Power Green Energy Trust). WDA and the Mid Wales Partnership also provided financial assistance. £37,500 came from shareholders of the co-operative. BDCR used the Renewable Energy Investment Club [REIC] to raise money from local shareholders. They succeeded in raising £54,000 in 3 weeks and were almost £17,000 oversubscribed. There were also contributions from Powys County Council.

Obstacles to be overcome

When the project was first mooted there were objections from one local person, who withdrew her objections when she realized that this was an authentic community project. In addition, Snowdonia National Park Authority lodged a formal objection on the grounds that the turbine, although it would be outside the national park boundary, would be visible from within the national park. This objection was over-ruled by Powys planning department.

In addition, the project went through an extended development process:

"It's only a small wind turbine by modern standards and it was second hand. It went through a long development process before it decided on the exact site and the exact turbine. We had to change the size of the turbine and the site of the turbine was quite a battle."

Andy Rowland argued that the main obstacle was the complex structure of energy generation and distribution in the UK, which makes it extremely difficult and costly for a project of this type to produce and distribute electricity to the local community. Moreover, actual electricity generated by the windturbine was not used directly by local people but distributed through the National Grid, which led to problems bound up with local identity and project satisfaction:

"The financial dealings with the electricity are completely separate from where the electrons flow. And that's difficult for local people to get their heads around. It's frustrating because they want to buy the electricity from the turbine they can see. So psychologically that's the trick - because of legislation and the regulatory arrangements it's very difficult to arrange that. You have to buy and arrange… you have to go through a very costly process to become a public supplier of electricity."

"CAT uses what it needs at the time which will vary depending on the demand at the time but it's on average about 35% over a year and then the rest they spill into the National Grid or they sell it to the National Grid to a supplier that they've made an agreement with. What actually happens of course is that it is used in the local village which is Pantperthog. But the Pantperthog villagers don't see any change in their electricity bills because each resident will have made an agreement with a particular electricity supplier. So the fact that they're using green electricity doesn't show up in their bills unfortunately."

The market for the business

Andy Rowland characterized the community windturbine as an *'ethical investment'*, and argued that this was an area of growth:

"Well there is an established growing niche market for ethical investments and this is part of it. I mean there are much bigger offers that have gone into the same UK-wide market from companies like Bay Wind, and so it's an established and growing market."

Current position of the project

The turbine has had two complete years of operation. Andy Rowland said that the first year was relatively poor in terms of output, due to technical problems. A major problem was the low reliability of the National Grid in the area, with widely fluctuating voltage.

As a failsafe precaution, when the grid voltage goes outside set limits it shuts down. Consequently, the windturbine also tripped-out and production was lost. In addition, the first year was a poor year for wind.

The technical problems with the grid have now been rectified, and production is on track.

Employment

The windturbine does not support any direct jobs, except the maintenance jobs in CAT, which are held by local people. There were a number of additional jobs when the contract was in progress.

Socio-economic impacts

Direct economic benefits from the windturbine are relatively low. There are, however, significant benefits in terms of social capital and place identity bound up with a community project; a co-operative; pollution-free and carbon-free energy generation; and ethical investment.

"Yes, a lot of people were quite chuffed that that wind turbine up there is producing electricity and has been done by the local community. So there is a kind of pride factor involved for some people - obviously those who are involved but some other people as well. And then in a wider circle of the community it has demonstrated that it's not always the case that it is a big utility that has to come and do the wind and that's one of the main resistances to wind power around here. Obviously the visual effect is controversial from commercial wind farms but I'm convinced that a lot of people will change their view on that depending on who they think is profiting from it. If their perception is just some big multinational that has come in and it's basically taking all the profit from our local wind then that causes resentment. But if they think OK it's not me but you know somebody in the local community is benefiting from that that puts a completely different slant on it."

Connections to the natural (local) environment

The community turbine uses the natural resource of wind-power.

Enhancing the local environment

As Andy Rowland pointed out, aesthetically, of course, windturbines tend to be controversial and opinions concerning them are personal and subjective. Andy argued, however, that people balanced aesthetic values against the problems of global warming, climate change and CO2 emissions:

"So some people will see that and think oh that's nice - and the reason they think that probably is because they know something about global warming, climate change and about fossil fuels and CO2, and they probably think it's being of some use. And other people will like the look of it and other people won't like the look of it. But the use value critically informs people's aesthetic judgment."

"That's why people do it. That's a critical motivator. They didn't do it to make money. They did it as an ethical investment to reduce climate change. But it's a bit of this kind of chalk and cheese thing here because the climate change is a global situation and how it looks on your hill is a local situation. So how you play one off against the other is very tricky."

Innovation

Andy Rowlands considered that the innovative aspects of the project were the ways in which the financial and technical components had been linked to bring the project to fruition.

"There's nothing innovative in the technology but it's in the social and the economic model where the interest lies."

Potential for business

BDCR have recently been successful securing the contract to purchase an existing non-operational windturbine site, including associated power purchase contracts, grid connection, planning permission and lease agreements from CAT. The project will harness wind energy to generate a sustainable long-term income for the Dyfi valley. BDCR will purchase the site from CAT and replace a non-operational prototype 600Kw wind turbine with an operational one. The turbine will be owned by shareholders of the local community and Eco Dyfi. It is estimated that the project will bring in the region of £200,000 to local companies in terms of contracts during the construction period and approximately £95,000 pa to local companies, shareholders and residents in the Dyfi Valley through income to Eco Dyfi. A large number of local companies, self-employed contractors, farmers, companies and community organisations will benefit from the proposal. These include CAT, Eco Dyfi, BDCR, REIC, FC, two local landowners, a wind turbine construction company and five local self-employed contractors. All construction materials will be sourced locally. Once the project comes on-stream BDCR will be able to employ a part-time administrator and technician to run and operate the two turbines and the co-operative. The second turbine is going to be grid-linked so BDCR will sell all the electricity into the National Grid - in this case it will be sold to the Non-Fossil Fuel Purchasing Authority. This second turbine project is scheduled to start in May 2006 and to complete by the end of the summer.

"The second turbine is going to be grid linked so BDCR will sell all the electricity into the National Grid, actually in this case it will sold to the Non Fossil Fuel Purchasing Authority. And then for an individual householder in Pantperthog - if they wish to buy green electricity they have to make a contract with a supplier of green electricity such as Good Energy so, as I've said, the financial dealings with the electricity are completely separate from where the electrons flow. And that's difficult for local people to get their heads around. And it's frustrating because they want to buy the electricity from the turbine they can see."

Synergies with other environmental and/or business sectors

The key synergy is with CAT. CAT has a wide portfolio of alternative technologies and a strong commitment to education:

"It will add to people's experience and understanding of not only the energy field but the other things that they will get exposed to there - organic growing and recycling and waste and all that - so a holistic understanding of what it's all about - what sustainable development is all about."

Andy Rowland also pointed to other synergies through the wider Eco Dyfi project. These involved sustainable development and integrated rural development through the the establishment of a biosphere reserve and the development of the Dyfi River watershed area:

"Renewable energy owned by the community is one example of where we get involved in that debate and sustainable tourism is another area. So the other way of looking at it is we are about integrated rural development and the way that we hope that this can be taken forward over the next several years is through something called the Dyfi biosphere reserve. This is not an Eco Dyfi project but Eco Dyfi for many years now has had a role in helping to make that designation mean something as opposed to being just on paper. It is a UNESCO designation so it has got the power of the UN behind it and it's… well originally it was a designation for habitat and biodiversity seeking to protect our most valuable areas from the point of view of the natural environment. There was a big review while Britain was actually out of UNESCO. When we came back in we found the criteria had changed and now it's a designation for beacons of sustainable development so it is still rooted in biodiversity but it's a purely voluntary designation and it's now about how local communities can interact with habitat and biodiversity and how it can both protect those vulnerable areas and benefit from them simultaneously. So it's not primarily about the protection because there will be either EC level or UK level statutory designation is protecting the most vulnerable areas so in our case that's the estuary and the local national nature reserve. So CCW is the regulatory body for that and will continue to be so. The added dimension, the added value of this designation, is how can the community become more aware of that, the value of that, get more involved in protecting it? ……If as a whole community we are going down this route and seeing this as our development path that we are seeking to develop the whole Dyfi Valley sustainably and make the most of our natural assets then there is an opportunity for branding using the UN brand. That we can do on the back of the biosphere reserve if you like - to say this is the clean, green Dyfi Valley, this product is coming from the Dyfi Valley biosphere reserve with some kind of credibility behind it and that will be worth something in the marketplace. Equally with sustainable tourism, people can come on wildlife watching tours or even on study tours directly to study the biosphere reserve and then other aspects in which there will be an economic value to the existence of this designation. So we are just entering a period of consultation with the community to try and explain all that and ask people what they think, whether they think it is a viable development path, whether they want to be on board and if so how? And at the end of that we will try and take a judgment as to whether the community has come to a consensus that it likes the idea of it and is willing to get involved in a voluntary management plan and then we will apply to UNESCO for redesignation of this on the larger geographical area. At the moment it's just a small area by the estuary but the prospect is that the whole watershed could be in the project area."

Best practice

For this type of community-involvement project, Andy Rowland suggested that it was important to involve as many people as possible, at an early stage. In addition, it was important that people were fully informed; that communication was maintained; and that the process was transparent. These practices ensured that problems were identified at an early stage and could be addressed.

6.2 CRICKLANDS LTD

History

Close to the first Severn Bridge and Wentwood Forest, Cricklands is one of a group of businesses based on the Broome family farm. One of these businesses named 'Wales and the West' has been running for 30 years; it focuses on affiliated show jumping, which has a specific customer base of expert, professional horse riders seeking to improve their competitive skills. 'Wales and the West' has grown by 50-60% in the past 5 years. Cricklands Ltd was set up 4 years ago to, as James Broome, Show Director states:

"…try and reach people that we didn't reach before - they were riders that may be more aspirational riders rather than professional riders. Possibly at the grassroots level and some way beyond that up to the point where they become affiliated and professional - although we do have customers that are both professional and international and all the rest of it so we were there to sort of bridge a gap."

Cricklands stage weekend events for competitive horse riders, who bring their horses to the site; stay either on site or locally; compete in equestrian events in the Cricklands arena; attend social events organized by Cricklands; and spend money in the local communities.

"We try and find an event for them to come to that they can enjoy - and you know it's not all about winning. We have discos in the evening and we have talks and we have things that make the whole weekend like a holiday."

Participants generally arrive on a Thursday and leave on Sunday evening or Monday morning. When Cricklands first started, 5 weekend events were held each year; now they run every weekend from January to December.

Finance and Grants

Cricklands itself has not received any grants. To set up the arena, Broome and Company received funding from the Sports Council for Wales.

Obstacles to be overcome

James Broome could not think of any specific obstacles that had to be overcome.

"We had to do a feasibility study….. the local area and government and council and everything have actually been very good to us."

The market for the business

The market for this business is competitive horse riders, not necessarily of international standard but who may aspire to higher levels. James Broome observed that although this market was large and dynamic it tended to be incoherent. Unlike other sports there is no umbrella organization; riders only join the British Equestrian Federation by choice. James Broome estimated that 60% of horse riders were not members.

"There is an awful lot of it that is untapped, you know it's very sporadic …because there is no central organisation that deals with them all like with the rugby you see there will be the WRU and most people… almost everybody that plays rugby will be a member of one shape or form. Whereas with riding you don't necessarily become a member until you want to. So although we have got very strong organisation which is the BEF - the governing body of horse sports in Britain - there are a heck of a lot of people that own horses. Far more than about 60% aren't a member. So there is this sort of the unknown sector, which is the people that we are going for."

It is this unaffiliated, untapped sector that Cricklands is trying to reach. Consequently, Cricklands undertakes a large amount of advertising.

Current position of business

Cricklands is currently doing very well. The large majority of their events are full and they are approaching the position of having to turn people away. As James Broome observed, they do not want to turn people away but it is a healthy sign for the business.

"Yes, it's brilliant – I mean we are full most of our events. You know we are nearly turning people away which is a very healthy… we don't want to turn too many people away. But it's healthy to have a few people saying sorry we're full – I think that's a healthy situation so yes, it's going really, really well. Each year we seem to grow and say I know we're going to do more through the winter or now we're going to do shows in the week in the summer and now we're going to introduce this and we're going to do merchandise and we're going to do… you know the website has had about 1.6 million hits in the last

year, which for a not a website company is I think quite good, you know what I mean? So yes, it just keeps growing – it's really good."

Employment

Cricklands employs 3 permanent staff. For event weekends they take on large numbers of temporary staff for catering, judging, course maintenance and general duties.

"When the shows are on we employ loads of people. People to pick the poles up, judges, catering people - but they are not actually employed on a permanent basis – they are just working for me that day."

Socio-economic impacts

James Broome pointed to a formal evaluation that estimated that Cricklands events brought £1.4 million per annum to the local economy.

"We are now one of the biggest tourist attractions in Wales in as far as well certainly in Monmouthshire anyway we attract people to come and they stay over and when they are staying over they go to the restaurants and hotels and petrol stations and everything like that. And so they come and they spend money. They worked out I think before we got as busy as we are now that we introduced something… I mean certainly not to us - we wouldn't earn this much at all but to the local economy I think we were worth something like £1.3 million or £1.4 million worked out on how many people came to the area and spent their money."

The evaluation was based on numbers that attended events and how much on average visitors spend on commodities such as food, drink and fuel. Apparently, many horseboxes contain small (tiny) living accommodation for owners. Consequently, owners tend to eat out.

"We have a huge amount of people ringing up saying oh where can we stay? You know where can we go and get some milk and bread? I mean the supermarkets sell out every time we have a show on."

Connections to the natural (local) environment

It was observed that horses were perceived as an intrinsic part of the rural, and that the local natural scenery was an essential part of the events' ambience.

"We need green fields to have horses on full stop - it wouldn't work if we didn't. The scenery around here is lovely, you know we have got the Severn, we've got Wentwood Hills, we have got trees everywhere and I think when people come to an event they like to enjoy it and especially with horse events it's an outdoor sort of sport and it's part of the whole package really."

Enhancing the local environment

Cricklands maintains and conserves the environment of the arena, including tree-planting.

Innovation

James Broome pointed to a range of small ideas connected with event-related merchandise but considered that the real innovation was the weekend concept itself:

"To grow at the speed that we've grown in the last few years we have had to be very lateral thinking. We now have a business based around an area of I suppose riders and carriage drivers in general that weren't recognised a few years ago. So we have taken the step to say they are the people that we are going to go for and get them to come and stay over at our shows. Now for instance, most people at that level don't have the horse boxes with little live-ins at the front you know so when we first did it people were staying in the back of their trailers, you know putting up tents – everything. I mean it was like a mini Glastonbury. They came with their horse and went what do I do? You know they had never stayed away before. Since then they have all gone home and said to their friends this is brilliant, it's really good fun - you can ride, you can do that bit and then you can go for a meal in the evening and then you go to the disco"

"We found a way of 'selling it to people' - you know selling the concept of staying over and people have bought into it and enjoy it and coming to Wales we had 20 lorries, or 20 people rather coming from Scotland last year. They came and it's just their outing to Wales - I think we charged them £75 a horse to come and the stable and everything that we provided and I think they paid about £800 each for the transport which is ludicrous really but they still came, they saw that as their vacation."

"I think the central innovative and entrepreneurship concept is the fact that we have created a demand for a product that just wasn't there."

Potential for business

James reasoned that the business had to expand, and to aim to run an event every weekend of the year:

"He who stands still goes backwards."

Economically, there is a huge facility with high running costs – to make profits it must be operating and earning.

"It's probably only 1 day in 3 actually that we are trading. That's our shop open whereas most shops are open Monday to Friday and sometimes on a Saturday so they are working 6 days out of 7, we are working 1 day out of 3. So I mean I know it's slightly different but that's what we have to be… we have to be going for 5 days a week. We need a couple of days to tidy up and prepare but if everything is smooth, you know if you went to the NEC, which is obviously like a bigger version of, a colossal version of what we do, they have got something on one day and then they've got 100 staff go in, tidy it up through the night, prepare it for the next day and they've got something the next day. That's how it should be rather than a handful of people - oh we've got to set that up. That's how I see it, I don't want to be the next NEC but that's how it should run, one to the next, to the next, to the next and I'd rather have more staff, more events, more people, more money coming in, more pain in the neck for everybody that tries to run it. That's how it would need to be I think if we were going to do well."

To fill the gaps in usage, principally on weekdays, James Broome outlined plans for carriage-driving, and country sports such as archery and fly-fishing. In addition, he was exploring ideas for expanding the event-related merchandise side of the business. Before

these plans are realized, however, he argued that the core business of event weekends needed more time to become fully established.

Synergies with other environmental and/or business sectors

Synergies that James Broome was exploring included marketing rural Welsh food products at 'country events' in a 'Welsh food tent'.

"We have had the idea of doing like a carriage driving drop-in day where people come once a month and they have a go at doing that that they've never done before, you know a day in the country and do a bit of archery and fly-fishing or something so that people that never done country sports before can you know come along, have a countryish sort of meal and soups and all that kind of thing."

Best practice

To an extent best practice for Cricklands is circumscribed by animal welfare considerations, as James Broome stated:

"Very good question. The best practice I suppose is that number one is the customer doesn't actually come first with us, the customer comes a very close second but the horse comes first."

Consequently, Cricklands often had to turn down entrance fees from horse owners who wanted to enter too many events for their horse's welfare.

James considered it vital for the business that he and other Cricklands personnel attended other shows, as both competitor and spectator, to keep in touch with the customer's perspective and requirements:

"Yes there is a certain element of enjoyment doing that too, but I think that's absolutely paramount. Otherwise if Stephen Spielberg never watched another film his films I'm sure would soon start to go a little bit odd, wouldn't they? He might think they were wonderful but he wouldn't stay in the mainstream."

The final element of best practice that James Broome advocated was a 'hands-on' approach to the business – staying in touch with both staff and customers.

6.3 FORESTRY COMMISSION – COED Y BRENIN MOUNTAIN-BIKE TRAILS

History

To the north of Dolgellau in Gwynedd lies Coed y Brenin, one of the largest and most mountainous forests in the Forestry Commission's Coed y Myndd Forest District. Some ten to twelve years ago, an FC employee at Coed y Brenin, who was a mountain-bike enthusiast, had the idea of using the steep terrain of the forest for his sport. Seeing the potential of this, then new, sport he started to develop some specialist trails – there were originally four trails at Coed y Brenin. Initially these activities did not have a proper budget, and monies were diverted from other FC recreational budgets. The Forest District Manager [FDM] for Coed y Myndd highlighted how the initial mountain-bike trails were the work of one individual with a vision:

"Dafydd Davies who was a very keen mountain biker, still is a very keen mountain biker, doesn't work for the organization any more - has gone off on his own now…….he was quite visionary in looking ahead and seeing where the market for that kind of thing was actually going ….and he did it very much off his own bat - the provision of these routes - didn't really have a budget."

FC came to realize the value of the new facility and mountain-biking is now part of the FC business plan, with nominated budgets and personnel such 'Mountain-bike rangers'. From this low-key beginning, Coed y Brenin has developed and expanded, and is now widely recognized as a world-class venue for mountain-biking:

"I mean the actual bike routes are known as world-class - they have been graded you know of some of the best routes in the world - they are talking about places like Hawaii and other places - so yes it is internationally known. It always surprises me you go out there and you meet people and they have come from Norfolk or wherever you know, just for a days riding or a weekends riding."

Finance and Grants

As mentioned above the initial costs were met from FC Coed Y Myndd's recreation budgets. There was some low-level sponsorship *('in the region of £3,000')* from Red Bull and Karrimor, which is why two of the original mountain-bike routes are named for these two companies. Again mentioned above, mountain-biking is now part of FC's business plan, with nominated budgets. Maintenance costs are met from FC Coed Y Myndd's budgets.

FC has been successful in an Objective 1 bid to build a new visitor centre at Coed y Brenin. With 50% matched funding from WEFO the Objective 1 bid amounts to £1.6 million. The new visitor centre is due to open at the end of April 2006.

Obstacles to be overcome

Coed y Brenin is within the Snowdonia National Park and the FDM made the point that FC did not have Crown exemption; planning permission was required for developments such as the visitor centre. At Coed Y Brenin no planning problems had been encountered, but at Gwydyr, another FC mountain-bike centre in Coed y Myndd, the

owner of a stables and pony-trekking business had lodged a formal objection. In addition, the National Park Authority required estimates and assurances concerning visitor numbers, and FC were required to undertake an Environmental Impact Assessment. Constraints at Coed y Brenin included the various Sites of Special Scientific Interest in the forest and the impacts of mountain-biking on FC timber operations:

"We have had objections in Gwydyr north of here in the Penmachno development where in the forest where the bike route was being built there was a local stables; horse pony trekking kind of enterprise. And the owner of that saw it as a very definite detrimental effect on her business in terms of bikes. People have this perception of bikes whizzing around and how it is going to affect the horses so there are a lot of objections there. The National Park is hugely associated with volumes - how are you going to cope with them? Where are they going to park? And you know is there going to be erosion and that kind of thing. Will it be visible? So we have to, we do have to get planning permission for these where there is no Crown exemption or anything like that and we also have to have an environmental impact assessment determination."

"In terms of constraints there are a lot of constraints in Coed-y-Brenin because it's in the National Park initially. It's… there are various Sites of Special Scientific Interest throughout the forest. We have to balance it with our timber objectives because of the end of the day it is a working operational forest."

"We have to be aware of the diversity of users in Coed-y-Brenin as well, I mean it's a bit like Gwydyr - you have not just got mountain bikers; you have got walkers; you have got cyclists and other people and obviously we need to sort of keep them apart where we can and ensure the safety of them. So the main constraints are basically internal ones of conservation notification and operational constraints."

The FDM noted that there have been few complaints from mountain-bikers when felling, even clear-felling, has taken place. He attributed this to good communications between FC and the mountain-bikers, and suggested that mountain-bikers appreciated the new vistas and challenges, such as loss of wind protection, presented by newly felled forest areas.

Other operational issues concerned the integration of mountain-biking with the recreational activities of other forest users such as walkers, 'ordinary' cyclists, and family groups. The FDM also pointed to pressure from mountain-bikers to continually change, update and develop the trails, which is potentially expensive.

"People don't recognize how much it costs to keep these trails going and keeping them safe."

The market for the business

The market in mountain-biking was perceived to be dynamic and growing. As evidence the FDM pointed to the new visitor centre; the continued demands from within the sport for new developments; and the variety now offered at Coed y Brenin, which now includes walking trails and all-ability trails:

"And not just normal mountain bike trails you know you have to recognize that the market is sort of spreading, there is a family trail there now."

There are now five other FC mountain-bike centres in Wales, together with some non-FC venues.

Current position of business

Visitor numbers continue to increase at Coed Y Brenin.

Employment

FC now employs a dedicated Mountain-bike Ranger at Coed Y Brenin. The other employment benefits present in the local economy are discussed below.

Socio-economic impacts

The first thing to state is that FC does not run the mountain-bike centre and trails as a business – all routes are free to ride. The only charge is for the car park:

"The Forestry Commission doesn't get anything out of the cyclists - the money they spend all goes into the local economy, it doesn't come into the Forestry Commission at all. Because riding the routes is free; we don't charge for them. All we charge for is the pay and display parking machine. We don't make anything out of it at all - it costs us.

The benefit for the Forestry Commission is pressing all the right buttons with the different Assembly agendas such as Health and Well-being and things like that.
And I think the other one is Climbing Higher - you know about improving tourism. You bring people in through tourism. You get people on bikes, you know they are healthy - it's the whole green gym concept kind of thing."

The principal economic benefit was to the local economy, with a number of bike-related businesses in the area, such as bike shops and bike hire businesses in Machynlleth and Dolgellau, and other businesses such as bed and breakfast and catering. It was estimated that the mountain-bike centre brought approximately £5 million pa to the local economy:

"There is a figure bandied around of £5 million to the local economy. Quite where that figure has come from - it is quoted liberally and I have never actually seen the evidence for it myself. But there's no doubt that the people who ride these bikes I'm sure that the consultants will tell you they are A1's or whatever it is, whatever the definitions are, but they drive BMWs, they buy expensive cars. They spend on average between £1000 and £1500 on their bikes.
They have got high disposable income and when they come into this area they need bed-and-breakfast so the local pub gears itself for that kind of thing now. There is a house up in the forest and the woman there opens the kitchen window and does scones and jam and things like that in summer - so undoubtedly it has created jobs."

Connections to the natural (local) environment

The local natural environment was held to be critically important to mountain-biking. It was argued that people wanted to have *'that wilderness experience'*, and that Coed y Brenin's woods and mountain slopes provided both testing terrain and the visual value of

magnificent landscapes. This was particularly the case at Coed y Brenin, which is noted for its *'majestic Douglas firs'* and larches.

"People want to ride in that wilderness feeling. They want to ride through a nice landscape. They don't want their head down looking where they are cycling all the time - which they have to do on the technical bits. But I'm told it's nice to, you know just to stop and have views across the countryside so yes they do want the kind of wilderness, the experience. They don't want flat bits all the time - they want to be tested on the down hills and on the slopes and things like that. They like to ride through, Coed-y-Brenin is known for its majestic Douglas Firs - so I mean that's another thing – people, I suspect that people get that feeling as they do in America riding through the big Redwoods. You know maybe something like that they may be getting a feeling of not actually being in Wales, being somewhere else."

Enhancing the local environment

The FDM suggested that there were two sides to the argument concerning the enhancement of the environment. Coed y Brenin's Conservation Ranger might argue that mountain-biking caused environmental damage through erosion. In contrast, the Mountain Bike Ranger might argue that the bike-trails enabled access to parts of the forest that were not normally accessible. Moreover, the provision of delimited routes served to protect the biodiversity of off-route areas of the forest:

"We're very careful when we build the trails. There's a whole lot of constraints on planning that goes into building the trails so we treat it as like a corridor evaluation – the people who design these say we want to put the trail here. We are very up on where our badger sets are, where our Schedule 1 birds are nesting – things like that – so once that trail evaluation has been done it goes into the planning team who will then do an assessment for the known constraints."

Innovation

The FDM considered that the original idea of mountain-biking in FC forests was innovative. In addition, the development of Coed v Brenin and other FC mountain-bike centres had initiated innovation in forestry; in path and track design and maintenance, and in conservation and biodiversity. On a personal note the FDM stated that:

"I think it has also really rammed home to people like myself who you know are trained Foresters that forestry is much more than growing trees and cutting them down. You know there is a whole other use for forests and when you have got an example like this - you do realize quickly and when you live in this community you realize quickly how... you know the benefits it brings to it."

Potential for business

Although the FDM predicted that mountain-biking would continue to expand and develop, he considered that Coed y Brenin, together with other FC centres in Wales, was approaching saturation point.

Synergies with other environmental and/or business sectors

The principal potential synergy was the creation and maintenance of a critical mass of touristic activity in the area, to hold people in the area as a benefit to the local economy. Potential developments for this critical mass included canoeing at Coed y Brenin.

"One of the things we are looking at is broadening it from what it is known as as a mountain bike centre to a much wider sort of activity hobby is the way I think we will be looking to push in the future, you know there is potential for canoeing down the river through Coed-y-Brenin. You know I am sure there are other developments - there is the walking; there is the cycling - you know you are not far from Snowdonia."

Best practice

The FDM suggested that the forestry and biodiversity practices that had evolved at Coed y Brenin represented best practice in those fields. More broadly, he argued that good communications with the public was a key factor:

"*The Forestry Commission, over a sort of the last five years, the Forestry Commission's communication with local communities has improved out of all recognition. You know I go to many evening meetings and things like that and talk to local communities now and they look at you and say - oh five years ago you wouldn't have been here. Five years ago I would have just - you know - not really taken much notice of them. Big bad public organization, but we are not like that any more. There are still a few glitches in the system but on the whole our communication is much better. Whether I would see it as best practice in terms of other organizations communicating with sort of communities and things like that I'm not sure at the minute. I think we are getting much better and we are learning."*

There were, however, problems of communication with the mountain-bike industry:

"They very much see Coed-y-Brenin as a mountain bike centre and we don't - we see it as a wider thing. And of course when we take decisions that perhaps they don't like or don't see the bigger picture of yes and they do get a bit… you have only got go on some of the websites such as single track or whatever it's called and you can see an awful lot of bad press coming our way. Oh yes, yes. You see an awful lot of good press as well but yes sometimes we upset them."

The FDM suggested that these elements of best practice could be disseminated and transferred to other sectors. Indeed, to a certain extent they had been incorporated in the development of the new Tilhill economic forestry centre near Wrexham.

6.4 GELLIRHYD FARM ORGANIC

History

In 1991 Colin and Daphne Gardiner sold their electrical business in Abergavenny and bought Gellirhyd Farm, in Powys on the northern slopes of Sugar Loaf Mountain. At the time Gellirhyd Farm, which has stunning views of the Black Mountains and beyond to the Brecon Beacons, was a semi-derelict farmhouse set in 90 acres of land. As they did not have farming backgrounds, they invited various expert opinions on what should be done with the farm. One of the experts, an eminent CCW botanist, informed them that the farm was agriculturally unimproved – i.e. it was untouched by fertilizers, pesticides and other agents of intensive farming. Urged by CCW to set up an 'environmental management agreement' with the Brecon Beacons National Park, with Forestry Commission involvement, the Gardiners called in a range of experts to survey their farm. In summary the surveys revealed:

- 90 acres of unimproved land
- 100 old apple trees (planted in 1910), which were identified as a number of different extremely rare species – some were almost extinct.
- Extensive woodlands, much of which was coppiced.
- A number of rare species, including Red Data Book target species:
  - The Pied Flycatcher
  - Otters
  - The Native Black Poplar – the farm has the largest collection of this, the rarest tree in the UK.

While the Gardiners were pleased to follow the environmental management agreement and to undertake the conservation activities associated with their biodiverse farm, they needed to make a living.

Their ventures included sheep rearing and Bed and Breakfast. Sheep rearing ceased at the first hurdle when their small, hardy, black Welsh mountain lambs, the best breed for the farm, could not compete at market with much larger breeds such as Texel and Charollais, while after the Foot and Mouth outbreak of 2001 the Gardiners decided to stop doing Bed and Breakfast. They also decided to sell their apples. Initially, they sold apples to cider makers in Hereford but realized that profit margins for the producer were extremely low;

"Initially we were taking them to Hereford and practically giving them away to Bulmers and we found ourselves in the same situation as a lot of farmers do and this is not a criticism of farmers, far be it for me to criticise any farmer but basically they produce a raw material and they pass it onto someone else to add value to it. We were producing the raw material, we were getting about £50 a ton we had to pick them ourselves, we had to deliver them into Hereford and we wouldn't get paid until the end of the season - that made absolutely no sense to me whatsoever."

They took a course and bought equipment to make their own cider. While pressing the apples they made the serendipitous discovery that their apple trees were not only rare, they were all of completely different species.

"So we decided that we would turn the apples into a product ourselves, cider was the natural sort of idea, so we went on a cider making course to learn all about making cider and came back and converted a building, bought the press and all the rest of the equipment needed and off we went. We started picking, picked the first tree that was ripe, pressed the apples, tasted the juice well this is nice and then when we picked the next tree it was also nice but completely different and then we suddenly realised that all these apple trees were of completely different species."

This gave them the idea of entering the specialty market – organic, single variety apple juice.

"So we thought let's be different, let's not go down the route of the juice out there at the moment and we had done some research on what was available and you can buy apple juice at 69p a litre, there's no future in that whatsoever, so we thought let's get into a specialty market and let's keep each variety separate and capture each of the unique flavours and tastes of all these apples."

Since they started to produce organic, single variety apple juices the Gardiners have won a number of awards:

"We are the only food producer that has actually won four awards."

As a business Gellirhyd Farm has a number of strands:

- Organic, single variety apple juice – the core business. In addition to the original 100 trees, they have planted 500 trees, all of rare varieties.
- Coppicing hazel – selling hazel sticks to hedge-layers
- Making hurdles from hazel – Colin said that, although there is a large demand, he now only meets special orders.

"There's a lot of hazel, so I questioned why there would be so much hazel and of course they used to make hurdles for controlling sheep so I thought why can't I do that, set myself as a hurdle maker and in fact I could spend all my life making those – huge market.
I do it under pressure now. I got involved in some very large contacts and you get to the point where you just don't want to see another one but I will do it under real pressure. But I still coppice the hazel but in fact I have been selling sticks, the actual sticks, the coppice sticks for hedge laying in areas where they don't have hazel, Tyr Gofal insist you finish the top of the hedge off in hetherings, hazel hetherings and those areas that don't have hetherings I can supply."

- Charcoal making – Colin did run this strand on a large scale in a cooperative with other producers, selling to B & Q. Although the demand remains, he does not make charcoal at present.

"Exploring in the woodland we discovered an old charcoal-making area. So I thought well if they were so clever then why couldn't I make charcoal so I started making charcoal and became probably the leading charcoal maker in the country, taught myself, learnt all about it myself and developed a very up-market product that was for artists that put a very, very high value on to the timber that people had said was worth nothing. Even barbecue charcoal was worth – made the wood £250 a ton. And then I set a group called the Welsh Woodland Workers and we were actually selling it to B & Q. And then as a multiple they start putting the screws in and eventually it all fell apart and we didn't supply B & Q and the other members of the group fell out and so it left me on my own. I've retired from charcoal making now sort of 2 years now but I still coppice my woodland albeit on a smaller scale."

Finance and Grants

They have had an Orchard Restoration Grant from CCW; a hedgerow grant; and they are in Tyr Gofal, the agri-environmental scheme that provides grant payments to farmers for practicing environmental farm management. In addition, although initially the Forestry Commission advised that their woods should be clear-felled for timber (a cost survey proved this to be unviable with a net loss), with recent changes in Forestry Commission ethos towards a more socially concerned agenda, epitomized by the publication of 'Woodlands for Wales', they won a woodlands management award.

Obstacles to be overcome

The Gardiners had difficulties obtaining planning permission, from the Brecon Beacons National Park, to convert a derelict barn to residential use. More generally, Colin Gardiner observed:

"Our biggest problem is actually dealing with bureaucrats who tell me what I can and can't do and I don't mind listening to people who know what they are talking about but invariably they don't and I have been quoted as saying a lot of them can't even - have never even managed a row of cabbages never mind… and if you don't tick the boxes which we don't. We don't tick all the boxes then you are into all sorts of problems."

The market for the business

They sell to local outlets:

"We are passionate about local food for local people."

Indeed, Colin argued that a problem with receiving food awards was that the WDA had introduced them to buyers from London-based stores such as Waitrose and Harrods:

"We have recently turned down Harrods. I would rather go to a farmers market in Usk than go to Harrods and spend two days in Harrods giving tastes to people who probably don't even know where Wales is never mind appreciate what we do but we have a large following of very loyal customers and we supply hotels and delicatessens, farm shops, grocery stores - those few that are left, farmers markets, B&B's - you know across-the-board and it's a local product, it's all local. We have a problem also in that other places in Wales want our product. The difficulty is how to get it there, it's a distribution problem and no one has addressed that yet."

Current position of business

Colin Gardiner stated that the market for their organic apple juice is growing, and they can sell all the apple juice that they can produce:

"Everything we grow we can sell - I mean we will sell out this year by June, we won't have any and we start picking in August and the orchards when you start planting the trees the sort of trees we plant you don't get any fruit for 7 years - not even an apple, so you know it's from 7 years to onwards then you start getting fruit but even then not enough so you're talking 10-15 years before you get… so it's a long-term thing and it's growing, it's growing slowly. There are only the two of us do this and the temptation is to say well yes let's push the boat out, let's get a unit factory and quadruple production and buy in apples but then we become just another Capella at 69p a litre - you know we don't want that."

Employment

Colin and Daphne run the business on their own.

Socio-economic impacts

Colin Gardiner observed that the local community had tended to be rather fragmented, with small settlements, widespread farms and some historic inter-family enmities. The Gardiners have, however, become integrated with more and more local people and take an active part in the community, such as a recent successful bid to the Heritage Lottery Fund for £250,000 to renovate a listed building for a village hall.

Their principal economic impact is selling their produce to local retailers; providing a product with place identification that helps to maintain and enhance the local economy.

"We have only been part of that, it didn't come from me but we are very much part of it and I mean the other thing is to provide a product into the local community as well - we have some very good outlets here,

the Bear Hotel, Crickhowell, the Griffiths Hotel, a grocery shop in Crickhowell and Crickhowell is a unique sort of place - it has still got an old grocery shop and people are loyal to that shop so we've yes we sort of we integrate and very much for the local community."

Connections to the natural (local) environment

Given that their business products are harvested directly from the local environment, the Gardiners have strong connections to it. It is in their interests, and their inclinations, to foster environmental sustainability:

"The natural environment is really important to us, particularly this farm and we feel very much sort of privileged to have come across it and to be able to manage it in the way we do for the time we are here. We also recognize that there will come a time when we won't be able to do it and then we have some major questions to be asked but when that time comes we will ask the questions. The future of it is, does concern us. How can you secure all the effort that we have put in to put all these rare apples, particularly the rare apples in - how can we protect those in the future? That is very, very difficult."

Enhancing the local environment

Living and working on this organic farm has engendered a strong environmental ethos, and, in addition to enrolment in environmental management schemes, Colin is interested in how to measure the success of such schemes. He has suggested to CCW and other bodies that monitoring the bird population could be a measure of environmental health:

"Yes, that's one of the features of this place is enhancing wildlife and identifying wildlife habitats and improving them, creating wildlife habitats and enhancing those that are there. Now I am not an 'ologist' at all but I look at things and how do you measure whether you are successful or not is a big question and the question I have constantly asked of CCW and other authorities with these schemes how do you know if you're successful or not? If you set out your aims and objectives how do you know if it's working? The only way you do that is by monitoring, monitoring the effects of what you do - that's a 24-hour job 7 days a week - I mean you couldn't possibly do it. So what we do is to use birds as the indicator. Yes, our feeling is that if the bird population remains fairly good and all the species are here that would indicate that there is some sort of food keeping them going."

Innovation

The business was held to be innovative in that it produced organic, single variety apple juice. Colin believed this to be unique, and it enabled a premium to be charged:

- Colin showed me a popular brand from a supermarket chain at £0.65 per litre.
- Gellirhyd Welsh Farmhouse Organic Single Variety Apple Juice retails at £2.50 per 0.75 litre - £3.33 per litre.

"So that's the innovative thing is the uniqueness of all these different varieties and we just happen to have a lot of very, very unusual varieties of apples that most people have never heard of. And each one of them has got this unique flavour, texture, taste – imagine putting 50 apples there and biting into 50 different apples."

The apples of those varieties that do not produce enough in any year to warrant a single variety vintage are not wasted; they are pressed together to produce a juice named 'Orchard Gleanings'. This is sold at local farmers markets with full information concerning its constitution; selling it in shops would breach trading standards.

Potential for business

Given that they are able to sell all they can produce, and have rejected some markets, Colin argued that there was considerable potential for the business. The constraints were their time of life; their disinclination to employ large numbers of people; and a shortage of apples in the UK:

"The future is there is only the two of us doing this and we don't want to go down the road of employing lots of people - we've been down there and we wouldn't do that again. Our maximum would be 15,000 to 20,000 bottles a year and we can produce that and we can sell all that. The potential would be to become quite a large producer if we had the apples - you have got to find the apples and 80% of the orchards in this country have gone on the last 20 years, just disappeared - grubbed out. There is no market for the apples. We bring in apples from New Zealand and when you go in the supermarket there are English apples, very few - there are a couple but most of them come in from God knows where."

Synergies with other environmental and/or business sectors

The Gardiners were exploring the possibility of connecting with a transport firm to take their produce to wider markets in Wales. Colin Gardiner, however, related a story that illustrated the potential problems of seeking synergies in rural communities. Having extensive areas of bracken on his farm, Colin, true to his organic ethos cut it down without recourse to chemical agents. He had also explored ways of utilizing, rather than burning, bracken, and had come up with a compost that gardening authorities and academic experts judged to be an excellent organic product, with the potential for a profitable market:

"I teamed up with a Professor Taylor up in Aberystwyth University who had been studying bracken all his life. He had all the technical know-how about bracken and I had all the practical know-how to do it and we sat down and we worked out that if you could harvest 25% of the bracken in Wales up on the hills there was £60 million worth of compost annually."

Following a series of successful trials, Colin Gardiner and Professor Taylor gave a presentation to farmers at a local hotel. At the end of the presentation, a local man stood and invoked the local laws of the commons – 'Thou shalt not remove anything from the common unless you have permission of all of the commoners.' Moreover, he emphasized that the operative word was 'all':

"And you had this feuding and we had to abandon the whole thing. And that just taught me a lesson."

Best practice

Colin Gardiner argued that the future for farming and agricultural food producers was in environmental conservation and management rather than intensive production – but funding was required:

"I think in the future if you look to the future, if your crystal ball is plugged in and functioning, the emphasis is eventually going to be on conservation and the environment - it has to be and so if you could link anything to do with the business and the environment, I think you are going to be quids in. And there may be some funding to help, you whereas in the past all the help has been on production, production, production.
And thankfully that has all gone. But you know, lots of 'ologists' and politicians and all sorts of people come here and rave about what's here and what we do and everything but it doesn't put meals on tables. If this is what you want to do then it has got to be funded - someone has got to fund it from somewhere. If the environment is of paramount importance then you have got to get away from intensive farming. If someone wants to fill his place with sheep that's entirely up to him but I don't think he should be subsidized to do it.
And in the past they have, but if you want to farm for the environment and you can prove that you are enhancing wildlife habitats and things like that then there should be some reward for that. If that's what governments want - they may not want that - but I think they do."

6.5 NATIONAL TRUST – DINEFWR CASTLE PARK

History

Dinefwr Castle is located in the Carmarthenshire town of Llandeilo, which is also the base for offices of the National Trust in Wales. Situated in the Tywi Valley, Llandeilo is a small, attractive town to the west of the Black Mountain. Dinefwr is an ancient parkland estate, which is important in the context of historic Wales; for its designed landscape; and for its biodiversity. For example, National Trust research had revealed that Dinefwr is:

"….one of only about three places in the whole of the UK which has 800-year-old maiden oaks. So you are dealing with a very fragile and very important environment."

From its former status as a single estate Dinefwr had been sold off in smaller parcels of land. Since the early 1980s the National Trust has been acquiring the estate piecemeal with the intention of reinstating it as a single, integrated parkland estate. The most recent acquisition was the Home Farm, which had been an intensively farmed dairy unit of 200 cows that had polluted the unique environment of Dinefwr with fertiliser, slurry, silage and effluent.

"The part or the phase of the project we are looking at now is where we had managed to acquire the Home Farm which was an intensively farmed dairy unit which was impacting against the environment of the historic parkland."

National Trust projects aims are to:

- Safeguard Dinefwr's unique and fragile environment
- Restore the historic designed landscape.
- Invest in the landscape and use the environment as an economic driver to bring economic benefits.

Finance and Grants

Carol Greenstock, National Trust Grants Manager for Wales, outlined the grants that had been received for the Dinefwr project:

- Heritage Lottery Fund
  - Stage 1 safeguarded the acquisition of Home Farm.
  - Stage 2 is for work on the designed landscape - £1.2 million.
- Objective 1 (Priority 5 Measure 7 - Sustainable Countryside Enhancement and Protection of the Natural Environment and Countryside Management) - £2.1 million.
- A significant variation within the Objective 1 funding has recently been secured to acquire the inner courtyard at Dinefwr, which will be used for developments such as volunteer accommodation.

Obstacles to be overcome

The National Trust has planned the project to ensure its smooth operation. For example, they invested in a conservation plan by a landscape historian, and liaise closely with the Countryside Council for Wales in terms of the parkland; the Welsh European Funding Office; and planning departments (a number of the buildings at Dinefwr are Grade 2 listed).

The market for the business

Carol Greenstock identified a number of growing markets for the project. The primary market for the National Trust is to raise the profile of Dinefwr in terms of its design, environment and history in Wales and to increase visitor numbers to the parkland. Carol Greenstock observed that:

"There are a variety of markets. Obviously from the National Trust point of view the main market would be visitors to increase… to raise the profile of the parkland in terms of its design, environment and history in Wales and to increase visitor numbers to the parkland so within the project there are visitor facilities built into the project to enhance the visit to the site so although that's not directly investing in the environment it is using the environment as if you like an economic driver."

Another market for the National Trust is the provision of training in historic building skills such as dry stone walling, lime rendering, and plastering, and in the rural skill of coppicing, hedge planting, and raising trees from locally gathered seed on the property. In addition, the National Trust manages a deer herd at Dinefwr, which produces venison for sale, and the herd of wild white park cattle discussed below.

Carol Greenstock argued that:

"I think that the Wales tourism market is perhaps currently under-exploited. We have far more than most people realize so I think these markets can be dynamic. The trick there is to ensure that you don't exploit the very thing you are trying to protect. So you need to find that balance. I mean Wales is still one of the few places you can go and enjoy yourself as very few people on a beach for example or if you're walking on hills if you don't go up the main things like up Snowdon or up the Beacons then you can still walk across hills like the Preseli hills or mountains like the Black Mountains without having to bump into people every other step. So obviously there is scope for more people to come and visit. I mean you could go and walk around Dinefwr now and probably be able to walk around it without having to meet other people which is what a lot of people want in terms of quiet enjoyment. Now obviously we want to increase access to Dinefwr, we want to increase visitor numbers to Dinefwr but we still want to do it in such a way that we are not cramming a lot of people into a small place - spoiling their enjoyment and impacting against the very environment we are trying to protect."

Employment

The Dinefwr project employed up to 20 people. When the project is completed it is forecast to create 6 new FTE jobs plus an additional 9 part-time jobs. There is the potential for more jobs if visitor numbers rise.

Socio-economic impacts

Dinefwr is a free recreational and environmental resource for the people of Llandeilo. In addition, Carol Greenstock argued that Dinefwr was an important component of a potential *'critical mass'* in the area, which would attract and retain tourists:

"There is also an indirect impact through tourism on the town because the town has an infrastructure including the Cawdor Arms, which is a prestigious hotel in the town, supported by what exists in the Tywi Valley - you have Dinefwr, Aberglasney and Middleton. If you increase the critical mass by bringing Dinefwr to the same sort of prominence in terms of people's knowledge then they don't just visit Middleton, or Aberglasney, they could visit all three and they would spend longer in the area as well as a result of that. So if you can encourage people to stay overnight then you increase the individual spend - so it's a better economic driver. Again that is a way that you can maximize benefit from the environment."

It was argued that the enhanced environment of Dinefwr has also had a beneficial effect on the local recreational fishing industry. As part of the project the National Trust removed three slurry lagoons that were causing pollution of a feeder stream for the Tywi River, which is an important salmon fishery.

Connections to the natural (local) environment

It was held that the natural local environment was critical and essential to the Dinefwr project, which is linked closely to, and is a significant contributor to, the Local Biodiversity Action Plan.

"Oh critical, it's absolutely critical. The environment at Dinefwr is extraordinary. It has... somewhere here I have got how many species are there and it is just quite amazing. You have got otters; you have got an enormous number of bird species; you have got an enormous number of invertebrates; lichens are hugely important there. .It's very hard to sort of enumerate them all but suffice it to say although it is contained within the LBAP this project because it's a project on its own has been funded significantly and contributes significantly to the LBAP."

Enhancing the local environment

National Trust policy and practice at Dinefwr is to conserve, enhance and manage proactively to encourage biodiversity. Examples include developing a management programme with CCW; an extensive programme for planting broadleaf trees; conserving ancient trees; managing the parkland by fertilizer-free grazing; and the re-introduction of ancient wild white wild park cattle from the original gene pool, which dates back to the eighth century.

"We are using the wild white park cattle to sell stock from as well. It's a rare breed so it lessens the risk of the breed disappearing."

Innovation

It was argued that using the environment as an economic driver was innovative. Other practices that might be seen as innovative, such as the use of ancient skills and vernacular building materials, the National Trust saw as essential.

"I think all of the projects I do are innovative. How is it innovative? Well I think using the environment as an economic driver is still innovative at the moment. In terms of innovation the parkland and everything will be sort of worked on a very self-sufficient basis and one of if you like an innovation within it is that some of our mowing machines are the ancient white wild park cattle which the gene pool that we have actually returned to Dinefwr was from the original gene pool which dates back to something like the eighth century. So if you like that's part of the innovation is not just having mowing machines in the form of four-legged ones but actually returning the white park cattle to Dinefwr. We also have a deer herd there which again there's an economic benefit comes out in the form of when you cull you have venison from them. We are using the white park cattle to sell stock from as well so that it strengthens the… or lessens - it's a rare breed so if you like it lessens the risk of the breed disappearing."

Potential for business

It was foreseen that visitor numbers would rise from the current figure of 20,000 per annum to 50,000 per annum. Other areas of business potential were a heritage skills training centre and a centre for learning about Welsh history.

"In business terms. Well we hope to raise visitor numbers from the current 20,000 to 50,000 a year eventually. I can also see quite a lot of potential for doing things like heritage skills training centre. Maybe a centre for learning about Welsh history - we don't know, we are still working on some of those longer term aspects of it."

"Well the potential in terms of the environment I have discarded that because it's going to happen - it will carry on; we will just carry on managing and what we will do is we will do baseline data, we are using things like GPS and things like that to monitor so we will just create a baseline data and then record at intervals from there and the National Trust has its own team of biologists and people like that who will come and keep an eye on what's happening and ensure that you know we are keeping the balance right."

Synergies with other environmental and/or business sectors

The principal synergy is the creation of a critical mass of touristic opportunity in the Tywi Valley, to which should be added the National Botanical Gardens and Arboretum, discussed above.

"*Well there is certainly a synergy with the other, two main projects in the Towey Valley which is Middleton and Aberglasney so in terms of tourism and in terms of the Valley if you like being a garden of one description or another because the parkland is a garden as well so you have the National Botanic Garden, you have Aberglasney Garden and then you have Dinefwr Park so there is obvious synergy there and I think that there could be synergies with building firms in Wales who potentially want to learn more about these traditional building skills - there is a great lack of them at the moment, in fact the National... oh it's the NHBC - the National Heritage Buildings Council is worried that there are a*

large number of skills that will disappear within 10 years and we are looking to redress that by running skills courses at Dinefwr as part of the project."

Other potential synergies were envisaged:

"…with building firms in Wales who potentially want to learn more about these traditional building skills - there is a great lack of them at the moment. In fact the National Heritage Buildings Council is worried that there are a large number of skills that will disappear within 10 years and we are looking to redress that by running skills courses at Dinefwr as part of the project."

The National Trust are also exploring potential links with events such as farmers markets, other food events and the development of the main house at Dinefwr as an event venue.

Best practice

Carol Greenstock argued that the key for the Dinefwr project was integrated land management; balanced land management with minimal impact. The National Trust were developing the dissemination of these practices to other sectors; there had been a study by KPMG and there are plans for an impact study.

6.6 TYF GROUP, ST DAVIDS, PEMBROKESHIRE

History

TYF started in 1986 when Andy Middleton, now the Managing Director of TYF, returned from two years traveling following taking a degree in Geography at Sheffield University. In his own words he had some wonderful adventures but came to the realization that there was nowhere better for adventure than his home town of St Davids in Pembrokeshire. Moreover, Andy wanted to bring jobs to an area with few employment opportunities. With *"a background in sports coaching and entrepreneurship"*, Andy spotted a gap in the market and went for it.

"We started 20 years ago – 1986. My background is sports coaching – well and entrepreneurship. When I left school I didn't know what I wanted to. I had a degree in Geography from Sheffield - I had one job interview, which I didn't get. So I went travelling for 2 years – did some great things in some great places but decided that the best place in the world was where I was born and brought up – in St Davids. I came back with the intention of bringing work here – there was very little employment here."

The initial venture was a small windsurfing school, with a land-base in an old windmill named Twr y Felin (TYF), which he was able to renovate with a £19,000 grant from the Tourist Board. From this modest beginning, TYF has grown into a multi-stranded business:

Events: A full calendar of sporting and social events connected with activities such as kayaking, surfing, windsurfing and climbing.

Adventure: A range of courses designed for beginners, intermediates and experts in water and climbing based activities.

Corporate: Management and business courses that involve outdoor and sporting activities, and include 30% of course time on environmental tasks.

Hotel: Accommodation available for course and event participants, and the general public.

There are also TYF equipment and merchandise shops at St Davids and Tenby.

Finance and Grants

In addition to the £19, 000 grant from the Tourist Board, TYF has received a few small grants over the years, mainly from the Tourist Board.

Obstacles to be overcome

The main obstacle identified was *"naivety – on my part and the bank"*, but this was gradually eliminated as the business developed. With regard to planning and local objections, TYF is integrated into the local community:

"We run education programmes with the local schools, most of our people are local, and I've served stints as a local councilor. We are part of the local culture and community – so there have been no major obstacles or objections to the development of the business. People are only too pleased to see us do well."

The market for the business

Events: International and UK market

Adventure: 85% UK

Corporate: Mainly UK

Hotel: Caters for people on the other strands of the business

Andy Middleton observed that TYF's markets are expanding and dynamic but remain vulnerable to trauma:

"These markets are volatile in as much as something like Foot and Mouth affected us, but otherwise they are expanding, dynamic markets."

Current position of business

TYF has made a profit for each of the 20 years of its operations – last year (2005) was its best year to date.

Employment

TYF employs 18 full time personnel. In addition, approximately 60 part-time personnel are employed for seasonal work.

Socio-economic impacts

As mentioned above, TYF is embedded in the local community. In economic terms, Andy Middleton stated:

"I have not had a formal evaluation but we bring tens of thousands to the local economy. We book more bed-nights than any other business in St Davids- we have a slow food policy – and we buy local produce for our hotel and food outlets."

Connections to the natural (local) environment

Andy Middleton asserted that the natural environment was:

"Critical – no essential to TYF. The business – kayaking, surfing, climbing - is immersed in it. "

In addition to these tangible connections with the environment Andy stressed the environmental ethos of TYF, illustrated by these interview quotes:

"We try to teach people that the environment is not just what you can see – the landscape and sea. It is everything around us."

"We are trying to take down the Chinese walls that separate the natural environment from the human."

"Our mission is to weave environmental responsibility into everything that we do."

Enhancing the local environment

In addition to fostering an ethos of environmental responsibility and care, TYF makes direct financial contributions towards environmental enhancement. For example, TYF is a member of '1% for the Planet', an organization launched in 2001 by Yvon Chouinard, environmental activist and founder of the outdoor clothing company Patagonia Inc, and Craig Mathews, owner of Blue Ribbon Flies. The Mission Statement of '1% for the Planet' is:

> '1% For The Planet is an alliance of businesses committed to leveraging their resources to create a healthier planet. Members recognize their responsibility to and dependence on a healthy environment and donate at least 1% of their annual net revenues to environmental organizations worldwide. The alliance aims to prove that taking environmental responsibility is good for business.'
> (www. 1% for the Planet.org)

To ensure that their contributions benefit and enhance the local environment, TYF have named as their beneficiary the West Wales Eco-centre. The most recent TYF contribution to the West Wales Eco-centre was a £10,000 donation.

Innovation

Andy Middleton pointed to a number of ways in which TYF was innovative:

> *"We set out to be leaders."*

- TYF is a carbon-neutral business.
- TYF invented a new sport – coasteering. Andy described coasteering as:

"It's like mountaineering but in wetsuits and on cliffs – the sort of thing you used to do as a kid."

Other innovations are in TYF's personnel policy:

- If the weather is right, staff can surf now – work later.
- Managers choose their own salary.
- TYF has 'open book accounting'.

Andy argued that these innovations were viable only with a work-ethic and ethos of personal responsibility:

"People have to realize that the important figure is the one at the bottom right of the spreadsheet. If you take a profit you have to earn it."

Potential for business

Andy Middleton suggested that TYF has:

"Tremendous potential – we have just organized a coasteering world championships. Our adventure programmes are more and more popular, as is the corporate side of the business – our list of major corporate clients continues to grow. Businesses are starting to see the value of the environment in terms of personal development."

Synergies with other environmental and/or business sectors

TYF works with the Pembrokeshire Coast National Park; local schools; and other local organizations:

"We train people to make a difference."

In addition, TYF has links to organizations such as Friends of the Earth and the World Wildlife Fund.

Best practice

For Andy Middleton the elements of best practice are:

"Be clear on values, and aims and objectives for the business. Then ask youself the question – will I look back and think – 'I'm glad I did that?' Set smart goals – ask yourself – how much money do I want to make? Then do a 'sense check'. Does it fit in with nature? Can I work with the limits I have set? Can it be managed?

7. RURAL REGENERATION AND THE ECO-ECONOMY

In this final chapter we draw together the analysis and suggest ways forward for the eco-economy of rural Wales. The analysis in this report is essentially qualitative. Although extensive use is made of quantitative data, particularly in Chapter 5, it is important to note that, as discussed in the literature review, among the key problems identified by ecological economics are the articulation of a theory of value and how to measure ecological costs and benefits. It must be recognised, then, that it is difficult to design quantitative methodologies that identify the economic benefits of eco-economic activities and to ascribe appropriate monetary values to those benefits. Consequently, this study should be seen as part of a development process for the eco-economy, and as pilot for future in-depth research.

An early task in the Introduction to this report was to develop, drawing on Brown (2001), a working definition of the eco-economy:

> **The effective management of environmental resources in ways designed to mesh with and enhance the local and national ecosystem rather than disrupting and destroying it. That is, the eco-economy consists of viable businesses and economic activities that utilize the varied and differentiated forms of environmental resources of rural Wales in sustainable ways that do not result in a net depletion of resources but provide net benefits and add value to the environment.**

With this working definition as a foundation the report then explores the academic and policy literatures, and a wide range of data sources to first identify gaps in both knowledge and practice, and second, to outline the current state of knowledge on the eco-economy of rural Wales.

7.1 Gaps in knowledge and practice

In the Introduction we point to the need to build the eco-economy into new regional debates; and the eco-economical paradox that exists in rural Wales between high environmental value and low economic activity. Low economic activity, labour market mismatches, and a rural 'spiral of decline' were highlighted in the WRO report 'Rural Labour Markets: exploring the mismatches' (WRO, 2006). Furthermore, in posing the question - why do these mismatches exist? – we argue that in policy terms there is a need to creatively link environmental value with economic added value; that is, to create and innovate sustainable economic development. In this current report we suggest that both the academic and the policy literatures have failed, to date, to integrate the eco-economy into the question of how the rural 'spiral of decline' could be potentially reversed.

Chapter 4 of this report relates specifically to policy and following a review of current sustainable development policies in Wales we identify a perceived lack of integration in the Welsh rural policy network. Drawing on Marsden *et al* (2004), we suggest that rural development programmes may receive less attention than more dominant regional development and agri-environmental priorities, and pose the question – where does rural development lie between the RDP and the Wales Spatial Plan? More optimistically, we observe an encouraging trend in Wales towards the articulation and mobilization of rural development within a more conscious and strategic regional framework; a trend

confirmed by the convergence on the eco-economy of the sustainable development policies and the strategy for economic development. And we reiterate the argument of the 'Rural Labour Markets' report (WRO, 2006), that the development of a spatial planning approach in Wales could provide the conditions for more innovative eco-economic thinking; provide a basis for bridging the traditional and economically thwarting divide between environment and employment; and begin to reverse the persistence of the complex business and labour mismatches identified in rural Wales.

7.2 The current state of the eco-economy

The discussion in Chapter 5 shows that the foundations for a viable eco-economy are in place in rural Wales. For example, while agriculture clearly retains its fundamentally important position in rural Wales, farmers will, in the future, have to diversify increasingly into non-farming activities as production becomes decoupled from subsidies. Perhaps even more pertinent to the eco-economy is the increasing take-up of agri-environment grant schemes such as Tir Gofal, by farmers in rural Wales. These schemes are, of course, designed to provide economic benefit to farmers; improve public access for leisure and recreation; and enhance the natural environment by landscape management and improvements in biodiversity. In addition, other rural primary industries also have a part to play in helping Wales to adapt to the new economic realties emerging due to rapidly changing environmental conditions (e.g. enlarging the reservoirs at Dinorwig hydro-electric power station).

Forestry is an important sector in rural Wales and FC (Wales), while retaining productivist practices, is developing a social agenda in parallel. The components of the FC social agenda in Wales, in addition to community consultation and partnership governance initiatives, include the development of forest parks and mountain bike trails; in short, aspects of environmental tourism and the eco-economy. Tourism more broadly is an expanding industry in rural Wales; an industry showing signs of a full recovery following the FMD crisis of 2001, with the assistance of the WTB Adfywio grant scheme. Given the abundant natural resources, the great majority of tourist activity in rural Wales could be characterized as environmental tourism, with activities such as mountaineering, walking, ornithology, equine pursuits, and sightseeing in historic and beautiful landscapes. More specifically, the eco-economy finds expression in a range of FC, CCW, National Parks and National Trust initiatives, including those discussed in this report at Dinefwr, Llanerchaeron and Nantgwynant. These and other landscape and biodiversity initiatives are examples of actual and potential inter-sectoral synergies cutting across the tourism sector.

The ruggedness of the Welsh countryside and coastline lends itself to a consideration of alternative energy production in, for example, the forms of wind-power, wave-energy and bio-mass. Options for alternative energy production are being actively pursued by WAG under TAN 8. There are, of course, a number of windfarms in rural Wales and more are in planning. Many of these existing and planned windfarms are sited on land managed by FC; an example of synergy between eco-sectors. As discussed in Chapter 5, sources for wave-energy could include the Severn estuary, which has the second largest tidal range in the world. Markets for biomass and energy crops are being developed through a range of projects. These include capital grants for SMEs to produce woodfuel burning equipment; research on energy crops such as willow; assistance to growers of Short Rotation Coppice; and financial support for farmers to grow energy crops.

Wales has a long and beautiful coastline and an extensive network of rivers and other inland waterways. Together these coastal and inland waterways support both recreational and industrial fisheries. In addition, as discussed in Chapter 5, forward planning under the Water Framework Directive of the EC is underway with the identification of three WAG pilot schemes for River Basin Districts in Wales: the Severn, the Dee and the network of rivers in west Wales. This will involve setting up partnerships based on river catchments with the aims of cleaning up rivers and initiating economic activities, based for example on tourism, to benefit local communities. We suggest that there is the potential for synergies with other sectors of the eco-economy in these plans, which, as discussed in Chapter 3, resonate academically with the concept of bioregionalism (e.g. Sale, 1985).

The traditional sector of mining and quarrying continues to support over 3,000 jobs but, as discussed earlier in Chapter 5, rather than being seen as part of the eco-economy, mineral extraction is more usually considered to be environmentally damaging. There are, nevertheless, potential synergies with other eco-economic sectors through the potential for planning gain and onward linkages to tourism, environmentally-related recreation such as mountain-biking, and landscape and biodiversity.

Earlier in the Introduction to this report, we suggested that the value of the countryside, landscape and biodiversity sector of the eco-economy to the eco-economy is captured by the high proportion of land in rural Wales designated as environmentally (and potentially economically) valuable. To reiterate, 30% of land area and 70% of coastal and marine environment are designated as high wildlife value and conservation importance at European level (WAG, 2006d). Together with the evidence summarised above, we argue that this points to strong potential growth for exploitation of the eco-economy of rural Wales.

7.3 Case- studies of the eco-economy

The case studies in Chapter 6 are snapshots of the eco-economy of rural Wales in practice. They are intended to demonstrate how eco-economic ideas arise, evolve and are developed; the problems that are encountered and how they are overcome; and elements of good practice. Three of the case-study interviewees, TYF, Gellirhyd Farm Organic and Cricklands, are entrepreneurs forging successful businesses through innovative approaches. Their business ethics and eco-economic inclinations reflect the ecological values that we have tried to capture in our definition of the eco-economy:

The Eco Dyfi community windturbine is an enterprise that taps into the idea of windpower as a fundamental natural resource as an ethical 'green' investment in energy supply by energising local identity and social capital. While, in a collective enterprise it would be difficult to identify one single entrepreneur, there is a real entrepreneurial spirit and innovation at work, not least in overcoming the complexities of the National Grid electricity supply structure, which seems designed to thwart enterprises such as the Eco Dyfi community windturbine.

The remaining two case-studies, (FC and NT) are, of course, enterprises operating under the auspices of nationwide institutions. Nevertheless they are both underpinned by sound ecological values; embracing the idea of using natural resources wisely; enhancing

the environment; and adding value to local economies and communities. In addition the FC and NT case-studies illustrate some of the ways by which broader state institutions can connect with, and initiate synergies with, the eco-economy of rural Wales.

Above all, these case-studies indicate that there is significant economic value in ecological values.

7.4 Developing the eco-economy

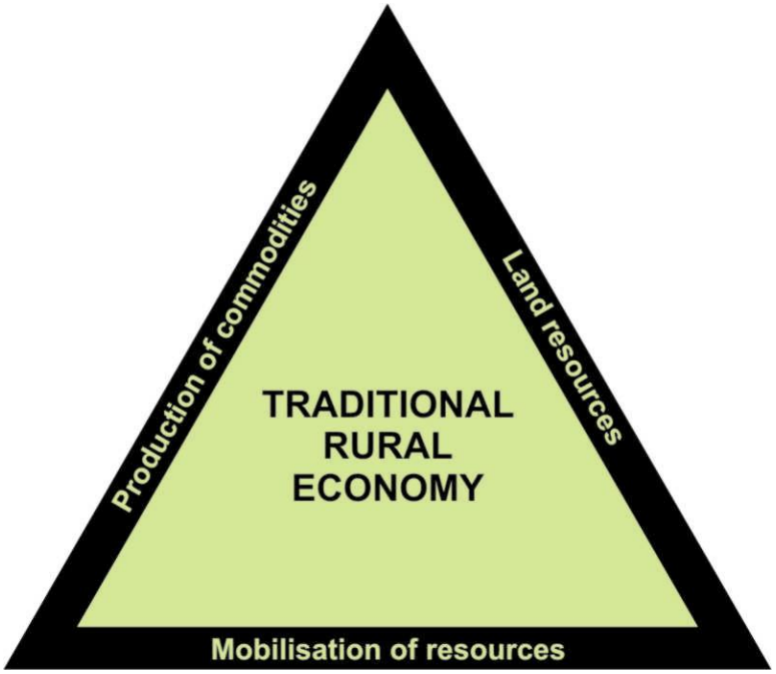
In seeking to develop the theory of the eco-economy we first return to the penetrative and specifically valuable work of van der Ploeg *et al* (2002), discussed earlier in Chapter 3, who present a theoretical model of how farm enterprises acquire new skills and move towards multi-functionality. Van der Ploeg *et al* (2002) use a Welsh case-study in their work. They studied four Welsh farms, two in the Gower AONB and two in the Less Favoured Area of Dinefwr, on the western slopes of the Black Mountain. [18] These four farms were entered into the Tir Cymen agri-environmental scheme, later succeeded by Tir Gofal. In addition, van der Ploeg *et al* studied the effects of Tir Cymen and Tir Gofal on rural Wales in general. They concluded that these Welsh agri-environmental schemes represented a mechanism that helped farms remain viable through public support linked into the conservation and management of the countryside. Arguing that the rationale and basis for public support will depend in the future increasingly on the provision of social and environmental goods and services, van der Ploeg *et al* point to the breaking of the link between subsidies and stock levels as a key factor in gaining public support. Further, they argued that the Welsh agri-environmental schemes were actively supporting the dynamics of integrated rural development by delivering environmental and conservation goods highly valued by wider society; by improving landscape management and biodiversity; and by safeguarding against future degradation of both heritage and environment. In conclusion, van der Ploeg *et al* suggested that the Welsh agri-environmental schemes could act as a model for future European schemes.

We suggest that the processes of broadening, deepening and re-grounding to better utilize natural resources and the ecology identified by van der Ploeg *et al* represent EM processes – the restructuring of the capitalist political economy along more ecologically sound lines - and that they can be adapted in the following general model, drawing on van der Ploeg *et al* (2002, p12), for the development of the eco-economy.

On this model, as illustrated at Fig. 7.1 below, the traditional rural economy comprises three aspects. First, there is traditional land use for the production of commodities. Second, there are the interactions, social, cultural and ecological, with the rural landscape and its inherent values. Rural economic enterprises contribute to either the maintenance of the local ecology, or to its change: either degrading or enhancing it. In addition they tend to form an intrinsic part of local and regional culture, and the social fabric of the countryside. Third, there is the mobilization and use of resources; that is, rural enterprises must be in a position to exploit natural resources. For any rural enterprise to succeed, it must coordinate these three interdependent aspects.

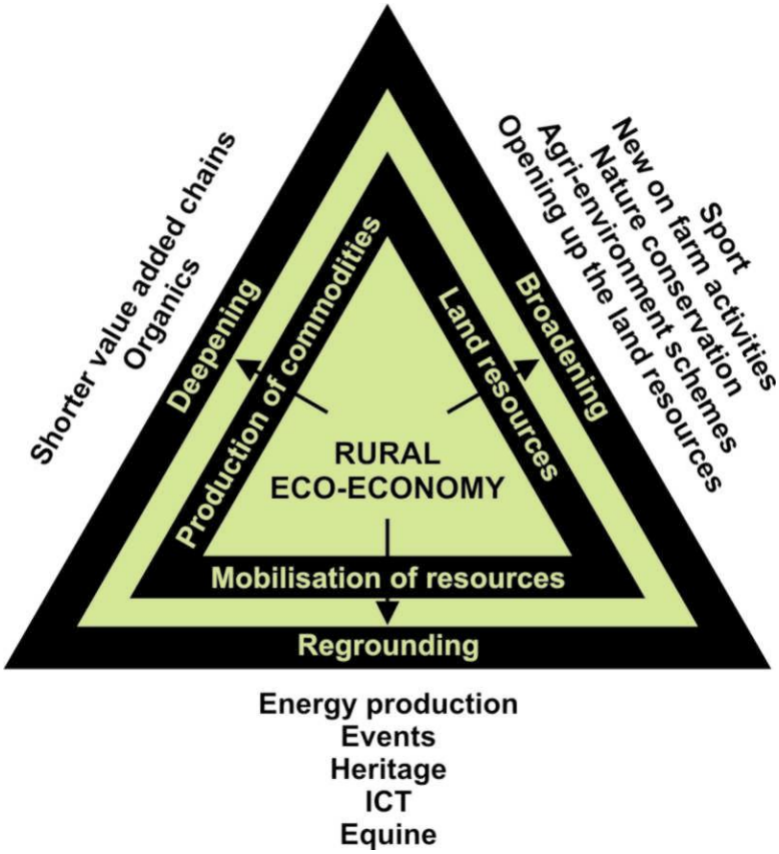
[18] See also the National Trust case study in Chapter 6.

Fig. 7.1 The three sides of the rural enterprise



In and through the processes of rural development the relations between these three aspects are both reproduced and transformed. These transformations are illustrated at Fig. 7.2 below. Traditional economic activities are deepened; transformed and expanded by linkages and associations with new actors and agencies. There is a focus on new products that add more value in the new markets demanded by wider society: organics, shorter supply chains, and value-added products. Typical examples of deepening are organic farming; high quality foods through on-farm production; and short linkages between production and consumption created by selling to local markets such as farmers markets. The interactions with the rural environment are subject to broadening. Examples of broadening include nature conservation, agri-tourism, leisure, sport and amenity provision, heritage, and energy crops. The mobilization and use of resources is subject to a process of re-grounding. Rural enterprises are grounded in new or different sets of resources, and become involved with new patterns of resource use. Examples of re-grounding could be energy production, special events, equine activities, and ICT.

Fig. 7.2 The dynamics of rural development at enterprise level



It must be emphasized that the dynamics of rural development are not mutually exclusive; enterprises can engage in broadening, deepening or regrounding activities. Thus summarily ascribing the activities of our case-study enterprises (Chapter 6) to the dynamics of fig. 7.2 we suggest that Broadening is being done by TYF (synergies between sport, leisure and business management); the National Trust at Dinefwr (opening up of land resources, amenity and landscape and nature conservation); and the Forestry Commission at Coed y Brenin (sport, leisure, amenity and landscape and nature conservation). Deepening activities are being undertaken Gellirhyd Organic (moving from traditional farming to organics and short value-added supply chains). Finally, regrounding is the province of National Trust (heritage); Cricklands (based on a family farm it has moved into the new activity of equine events); and Eco Dyfi (new, alternative forms of energy production in synergy with community partnership).

7.4 Strategic Concerns in realising the potential of the rural eco-economy.

Underlying the results contained in this report are two relevant questions: (i) how might the current levels of economic activity that relates to the environment of Wales be enhanced and activated such that it generates higher levels of 'value-added' economic activity in rural areas? And, (ii) how might the current and prospective policy and funding mechanisms that apply to the eco-economy sector in Wales (thus defined above) be better targeted to achieve these potentials?

It is clear, from the description in chapter 5, and our outline of the relevant sectors that currently form the eco-economy of Wales (figure 5.1), that there are significant forms of funding and policy that will likely continue (under the RDP and the new Convergence Funds, for example) to assist the development of the rural eco-economy. The question is, however, how might these be most effectively directed and integrated to further enhance activities both in and between the traditional productive and service sectors? As we indicated in the introduction, how might, in some cases, the severe local 'mismatches' between high environmental value but low levels of economic activity be bridged?

A first step in moving in this direction could be to apply and integrate the concept of the eco-economy into the delivery mechanisms associated with the major WAG strategic policies, including *Wales a Vibrant Economy, Wales Spatial Plan, the Environmental Strategy* and the new *Rural Development Plan*. The concept of developing the eco-economy would potentially overcome the traditional sectoral divisions associated with economic development on the one hand, and agriculture on the other, and provide a much needed raison d'etre for promoting real integrated rural development, without setting artificial boundaries around 'the rural' policy sphere. In this sense it 'kick-starts' a new vocabulary in which rural economic and environmental resources could be seen as a central part of a more vibrant all-Wales economy, rather than as a detached, protected and subsidised (and often crisis ridden) policy sector. It is clear from the results of this preliminary report that the rural eco-economy holds significant potential to play an increasing role in the Wales economy more generally.

Such a change in vocabulary needs also to encourage a change in traditional definitions of many of the key sectors involved. For instance, the 12% of Wales's land area managed by the Forestry Commission, and more specifically, the twenty thousand or so farm businesses receiving single farm payments and agri-environment payments need to be seen as central eco-economy businesses and resources at the centre of our 'triangle' of expanding and mobilising rural resources (i.e. regrounding, deepening and broadening approaches (Fig. 7.2). For instance, Wales has been successful in increasing the adoption of an increasingly tiered set of agri-environmental schemes, but how can these be made more beneficial for the non-farming parts of the rural economy? This is a question and challenge for the implementation of the new rural development plan. Integration here between the objectives of the RDP and the Spatial Plan is an important consideration, given that the latter could potentially set priorities for the different sub-regions in terms of generating more rural businesses around the eco-economy, while the former, could potentially allocate the funding for some of these new rural added-value activities under its four axes. In short, there is a set of strategic policy integration issues that are important to address in further realising the potential of the rural eco-economy, and to address the 'leaky bucket' argument in terms of public financing and value-added to the local rural economy.

7.5 Minimising the entropy and maximising energy of the Eco economy: energising the local

However relevant such strategic policy integration and development is, the results of this study and others that it has surveyed both from within the UK and across Europe, suggest that this needs to be matched and stimulated by *a growth in innovative entrepreneurialism in the private and community realms*. This has been often ignored both in the

lofty policy debates surrounding integrated rural development and the knowledge economy (e.g the Cork Declaration of 1996, Lisbon, Gothenburg, etc), and in environmental and sustainable development policy debates. Marsden and Smith (2005), for instance, through detailed empirical research of new rural development initiatives across Europe, have suggested that there are new forms of *'ecological entrepreneurship'* emerging whereby key actors who have strong ecological principles develop the skills to take risks in setting up new multi-functional businesses as well as engage and develop new procurement and marketing networks.

We have seen examples of these in our detailed case studies in Wales (Chapter 6). What is clear about these analyses is that there is a need to consider how institutional mechanisms (for instance, in the marketing sphere, rather than just the production sphere) can be created, often at little cost, so as to stimulate such entrepreneurship and new network developments (see Morgan *et al* 2006). These distinctive forms of entrepreneurship are inherently 'multi-functional' in that they usually involve new forms of *co-production* (say in the form of farming conventionally and organically, or farming and tourist and amenity functions); they rely upon redefining their property and landscape resource base (i.e. the re-mobilization of rural resources); and they find often novel ways of capturing value back into local rural spaces. Hence they are significant in *building the local capacity of rural areas* to produce ongoing flows of goods and services which re-capture value for the local rural economy.

A key question here, given the clear emergence of such initiatives across rural Wales, is how such initiatives could be multiplied, diffused and further embedded into the overall rural economy of Wales? This means studying, in some detail, as we have attempted to do here, (through case studies in chapter 6) the obstacles, opportunities and potentialities of their evolution and development over time and space. Currently we have no effective data base on which to examine these processes, even though our earlier survey of a 1000 rural businesses (which excluded agricultural businesses) included a significant proportions as classified as directly involved in the eco- economy.

In our view, from the research conducted here and that surveyed from other studies, this multi-functional realm is crucial for delivering more economic value-adding activity to rural Wales, and one that could really deliver sustainable rural development. But what are some of the pointers from the research that indicate areas where effective encouragement and support could take place in mainstreaming eco-economic firms?

It is clear from the evidence in the report and wider associated studies that one key characteristic of successful development of sustainable initiatives in business development concerns *a supportive local institutional and partnership ethos*. Our cases studies of best practice demonstrate that good entrepreneurial and project management skills need to be matched with a supportive local institutional context. This is associated with planning authorities, National Park Authorities, community groups, advisory and funding bodies. In this sense new forms of institutional capacity are needed that can, for example, strengthen marketing (especially linked to 'outside' markets) as well as help to contact new markets. Many of the studied cases had been assisted by external agencies in this regard, and these were not necessarily associated with partnership working under specific funding mechanisms. It would seem timely, therefore, to assess how land-managing authorities (such as NPAs LAs, Forestry Commission, Environmental Agency, National Trust, and energy and water authorities) could further positively encourage eco-economic business development, as part of their wider roles in delivering sustainable rural

development. This is, for instance, much needed, as our earlier results have shown, around the coastal periphery of Wales. This 'littoral' region shows a considerable mismatch between high levels of environmental value and corresponding low levels of economic activity and pockets of population decline.

Whilst of crucial significance, there has been a tendency in debates so far to focus mainly upon the supply-side features of the rural eco-economy, such as business development and firm growth. Of equal importance, and exposed in our case studies here, is the need to consider demand management and growth. This is a tricky area partly because of the high levels of fragmentation and 'niche-ification' of many of the markets, which are relevant, for instance, in the tourist and amenity areas. However, the food procurement policies currently being formulated by the National Assembly- attempting to re-connect local food procurement with healthier school diets etc- hold potentially important implications for widening and deepening the demand for Welsh rural goods and services more generally. Indeed, as one of our respondents indicated, the growing diet, health, exercise agenda needs to be linked to easier access to rural spaces and services. In the Netherlands, for example, one way to link health care demands to rural development has been the emergence of a network of 'care farms' managed through public and private partnerships. In Tuscany, other research we are conducting demonstrates the ways in which urban school meals can be procured from local and regional farmer networks, which are delivered under quality and organic criteria. These are potentially large markets for rural goods and services, and so far they remain largely untapped.

These latter conclusions point to ways in which the eco-economy in rural areas could begin to play a more functionally significant role in the economic, health and education spheres in Wales more generally. It is clear that a more vibrant and multi-functional eco-economy in rural Wales will not develop 'on the head of a pin'. Rather, it is important to see it as a relevant part of the wider 'Making the Connections' agenda whereby the private sector forms partnerships with the authorities, and where the latter provide further encouragement for the demand for a growing vector of eco-economic rural goods and services.

As our case studies indicate, this 'private sector' is largely made up of very small firms employing low-skill labour, which are attempting to redefine their available resources in ways that will open up new markets for their goods and services. The understanding of what makes them a success or failure, and how much impact they may have in contributing to the wider rural economy is still relatively poorly developed. What is clear, from a wider European perspective, is that these new forms of ecological entrepreneurialism are growing at a relatively fast rate. This suggests that it is necessary to re-think the connections between rural policy, labour skills and value-added, and rural small firm development in ways that can support real multi-functionality and co-production based upon the exploitation of new synergies between a range of activities (such as agriculture, tourism, the production of novelties and the provision of new services).

7.6 A concluding set of hypotheses

The research evidence in Europe suggests that a key dynamo for integrated rural development is related to the (relative) strength and density of the set of interactions and market exchanges that exist both within and between rural economies and their urban

and regional contexts. This is suggesting that *those rural local economies that will prosper are those that are most effectively relating and developing those market relationships and interactions*. Thus a concluding hypothesis might be that *the future relative strength of a rural economy will depend upon the positive quality and density of both its internal and external interactions and relationships.* In this sense more 'web' more gain.

However, we have to recognise that the exact nature of this quantum 'web' of potential internal and external relations is currently being reshaped by two major market and consumer- based forces. First, there is a continuous and competitive economic 'squeeze' (as we have seen from our earlier reports), on the value of rural resources (not least food, timber and rocks), which expresses itself in the regressive de-valuation of rural resources (not least by retailers, governments and price sensitive consumers). Basically producers of rural goods and services tend to have their shop door or gate prices squeezed while their input and overheads costs continue to increase. It is somewhat unfortunate from a rural development perspective that this 'squeeze' is given extra power by the power of protectionist environmentalism. This intended (or otherwise) consequence tends not only to add to the problems of cost-price squeeze, but also adds to regulatory and local constraints on development.

Second, however, as we have tried to explore in this report, there is a growing market and consumer expectation for the 'quality' implicit in a natural rural resource, which suggests that it could hold the real value-added, rural development potential. This force is one of re-valuation rather than devaluation and assumes a growth in what some call the 'economy of qualities'. Civil, private and government bodies are caught in the middle of this 'race to the bottom/race to the top' conundrum.

A way out seems only more managed exposure of rural areas, whereby rural economies both ecologically redefine and expose themselves to these competitive forces, at the same time as they are helped to manage the requirement to develop- deepen, broaden and reground- their interactions with the wider demanding publics. A second and important hypothesis, therefore, is that a multi-functional agriculture and forestry, more embedded in its territory, could become a major motor for establishing these webs of interaction and thus sustainable rural development.

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