

Countryside Council for Wales

Low Impact Development - Planning Policy and Practice

Final Report

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**University of the West of England
Land Use Consultants**

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This is a research report. The conclusions and recommendations are those of the authors and do not necessarily reflect the views of Countryside Council for Wales the Welsh Assembly Government and Pembrokeshire Coast National Park.

Executive summary

Introduction

The aim of this study was to investigate the nature of Low Impact Development (LID) in Wales, its relationship with the planning system, and to consider whether planning policy or legislation should be changed to take account of LID. *This study was concerned with LID in rural locations showing a direct link with the management of land. The term of LID can also be applied to urban areas but this was not within the scope of this study.*

The study involved:

- a literature review
- a review of planning policies in Wales and elsewhere in the UK relevant to LID
- consultations within Wales
- assessment of the Human Rights Act's implications for LID
- a questionnaire survey of Welsh LID residents
- five Welsh LID case studies which were also subject to a detailed sustainability appraisal.

The findings were then used to inform a thorough discussion of LID in the Welsh countryside leading to a definition of LID and detailed recommendations for planning policy and practice.

Background

The Welsh countryside is undergoing considerable change. Agricultural incomes have collapsed, holdings are being restructured, and agricultural policy increasingly seeks a more integrated future for farming. The Welsh rural population is growing slowly, but this masks an ageing of the rural population, and out-migration of the young. Lack of affordable housing is a growing problem in rural Wales.

Sustainable development is now a key theme of Welsh policy. For planning its importance is summarised as:

"The planning system has a fundamental role in delivering sustainable development in Wales.... In particular the planning system, through both UDPs and the development control process, must provide for homes, infrastructure, investment and jobs in a way which is consistent with sustainability principles." (Planning Policy Wales 2002, 2.1.5)

Low Impact Development

LID was coined by Simon Fairlie¹ in his book, *Low Impact Development* (1996) as:

"development that, through its low negative environmental impact, either enhances or does not significantly diminish environmental quality."

This is a broad definition but Fairlie was mainly concerned with subsistence-based development in rural locations where residents drew many of their daily needs such

¹ Simon Fairlie is one of the founding residents of Tinkers Bubble, Somerset, a high profile LID. He is also a former editor of the Ecologist.

as food and energy from the site. Thus LID is usually integrally connected with land management and as much as describing physical development LID also describes a form of livelihood.

Fairlie produced nine criteria for LID, which were updated to 15 criteria by The Land Is Ours in 1999. The criteria included integrated whole-site management and use, reversibility, minimised resource consumption, renewable resource use, on-site waste processing, and seeking an overall positive environmental impact.

As such LID often draws on other activities. These include Permaculture, which is an approach to designing land uses, houses, communities and businesses as sustainable *systems*, eco-villages, and sustainable building technologies.

There are a limited number of examples of existing LID in Britain including low impact communities such as Tinkers Bubble in Somerset, Lowland Crofting developments in Scotland, and more formalised developments such as the Hockerton Housing Project in Nottinghamshire.

LID and planning

Welsh national planning policy is very new (Planning Policy Wales 2002). It identifies nine principles and 18 objectives for sustainable development, which add up to a comprehensive set of requirements for the sustainability of new development.

In addition to this emphasis on sustainable development its policy for rural areas seeks integrated support for rural communities, economies and environments.

TAN 6 (2000) contains guidance for agricultural workers' dwellings which is currently used to judge LID proposals in the countryside. The test for such development requires that it meets a functional test for needing to be present on the site for the proper management of the farm and a financial test of the enterprise's viability.

Welsh national planning policy does not directly address LID, but in Scotland national guidance identifies low impact development as an acceptable rural land use, to be addressed through development plan policies.

In Wales and England there are a number of local planning policies addressing LID, including those covering Pembrokeshire, South Somerset and Milton Keynes.

Individual planning applications for LID have, to date, usually been considered as applications for agricultural workers' dwellings, and refused. Occasionally, though, applications have been recognised as different forms of development and approved. Tinkers Bubble is the most well known case and now has temporary planning permission incorporating a complex legal agreement.

LID and Human Rights

The main LID consideration arising from the Human Rights Act 1998 is enforcement action. The principal issue is whether interference with the rights of the LID residents is justified in terms of protecting the rights of the public. There are rigorous tests which authorities should consider before taking action. The balance of these two competing rights will vary from case to case.

A further issue is whether addressing favouring LID in the open countryside would be unfairly discriminatory. So long as this different treatment was *justified* as serving legitimate aims, achieved by *proportionate* means, this is unlikely to present obstacles to policies for LID.

Findings

Views of LID in Wales

Amongst the consultees understanding of LID in Wales varied considerably. Some organisations are unfamiliar with LID where as others understand it well.

A key concern was that LID should be properly controlled. However it was recognised that LID could positively contribute to environmental sustainability, though its links to rural economies and communities were less clear.

There was broad recognition of demand for LID, although opinion varied as to its scale and whether this was predominantly from incomers or Welsh people.

The nature and extent of LID in Wales

Through a questionnaire survey of all those living on LIDs in Wales, and those known to be interested in LID, a more detailed picture of the nature and extent of LID in Wales was captured.

40 questionnaires were returned covering 180 people on over 20 LIDs. Welsh LIDs vary considerably in size, and community / family structure. Together they show strong commitments to land and environmental management, and minimising environmental impact. Common features of LIDs were low environmental impact buildings and structures, food production, employment both on- and off-site, renewable energy use, reduced transport use, frequent training / education activities, and good community links. Roughly half of residents are Welsh, over half are welsh-speakers or learning Welsh. Arguments in favour of integrated site management and residence were common, as were strong environmental awareness and motivation.

Case studies

Five case studies were chosen to represent rural LID in Wales in a variety of situations. They were:

Brithdir Mawr, Pembrokeshire Coast National Park - a 67 ha holding housing a community of 12 adults, seven teenagers and four children under 10. This LID contains a number of innovative buildings including a roundhouse which has been the subject of a recent planning appeal.

Coed Hills, Vale of Glamorgan - a 'Rural Artspace' on a 73ha farm with eight residents. It includes residential accommodation, a café, studio and workshop / performance space, and holds regular arts events.

The Roundhouse Project, Vale of Glamorgan - construction of a roundhouse to the rear of a 7ha nursery site with temporary planning permission which precludes residential use of the roundhouse.

Tir Penrhos Isaf, Snowdonia National Park - a 2.8ha holding occupied by a single family in temporary accommodation and managed under Permaculture principles since 1986. Proposals for a dwelling were the subject of a recent planning appeal.

Tir Sisial, Ceredigion - 17ha holding occupied by a single family in temporary accommodation. A woodland and nursery business is run from the site.

Each case was visited and subject to a detailed sustainability appraisal covering economic, social and environmental issues. The headlines for the appraisal were drawn from *Learning to Live Differently, The Sustainable Development Scheme of the National Assembly for Wales* (2000). The objectives and criteria for the appraisal were drawn in the main from the sustainability objectives of *Planning Policy Wales* (2002), supplemented with objectives from *Sustainability Appraisal of UDPs - a Good Practice Guide* and criteria particular to the attributes of LID. A simple scoring system was used for the appraisal. Issues the sustainability appraisal revealed, under the four sustainability headings, included:

Social progress which recognises the needs of everyone

- LID residents, as a result of the very 'local' nature of their lives, usually form strong linkages with local services and facilities
- contrary to some opinion, relationships with local communities are usually good and sophisticated
- although incomers are a feature of LID, so are Welsh people, sometimes with local origins
- the proportion of LID residents speaking Welsh exceeds the national average, and there are many links to Welsh culture

Effective protection of the environment

- habitat management and the support of biodiversity are key characteristics of many LIDs
- where a LID project is correctly conceived and implemented there can be significant local environmental benefits
- landscape impact of LID is usually very low, with the buildings blending into their surroundings
- LID can involve environmentally low impact buildings which tend to be innovative rather than traditional in design and materials

Prudent use of natural resources

- pursuit of natural resource efficiencies is intrinsic to LID
- waste minimisation, recycling and pollution minimisation are common in LID
- LIDs frequently incorporate environmental education and the promotion of environmental good-practice
- it is a central feature of LID to make good use of food and other resources such as building materials from site
- use of renewable energy is common in LIDs as are low levels of energy use and high levels of energy efficiency
- LID often utilises sustainable water sources such as springs and wells. Grey-water processing through reed beds is common

- due to low domestic and transport energy use, greenhouse gas emissions from LID are low
- LIDs tend to make significantly reduced and more efficient use of transport compared to the average UK household, particularly reducing car ownership and use

Maintenance of high and stable levels of economic growth

- most cases were contributing to diversification and enhancement of the rural economy, usually through activities connected to agriculture and / or forestry
- contributions to the cash economy are usually very modest, as LID involves a significant degree of subsistence activity
- involvement in the local economy typically involves the sale of food and other produce and products from the holding, some educational activities, some provision of jobs for local people and some residents taking part-time local jobs
- many economic activities on LIDs maintain, enhance and diversify traditional rural skills
- unemployment levels are very low, as is the use of state support, although entitled

Of the five case studies Brithdir Mawr, Tir Penrhos Isaf and Tir Sisial have a planning history which has tested the current relationship of planning policies, decisions and LID.

Tir Sisial has been granted temporary permission for an agricultural worker's dwelling on site to allow the business to prove itself. Brithdir Mawr and Tir Penrhos Isaf have both been the subject of appeals concerning residence on the site. In both cases the Inspectors chose to use the tests for agricultural workers' dwellings, as set out in TAN6 (2000). In both cases the Inspectors concluded that both the functional and financial tests were failed and gave the sustainability credentials of LID only limited consideration. Both appeals were dismissed.

Discussion

Planning Policy Wales (2002) now sets a detailed framework of principles and objectives for sustainable development, including development in rural areas. From the survey of the nature and extent of LID in Wales, and from the case studies, whose appraisal was in large part based on the sustainability principles and objectives of *Planning Policy Wales* (2002), a detailed picture of the sustainability attributes of LID in Wales emerges.

Sustainability is central to the concept of LID and a key concern of most of those living on or wishing to live on a LID. From the evidence collected by this study it is clear that LID makes strong contributions to the environmental aspects of sustainability. Its contribution to the social aspects is also significant. LID's contribution to the economic aspects of sustainability is more modest but also positive.

What is most striking is that LID makes positive contributions to all three aspects of sustainability *together*, without trading off against each other. In this respect LID appears to be an intrinsically sustainable form of development. LID's weakest contribution is economic, but it is arguable that LID does not set out to make large monetary contributions to the economy, as it is a subsistence-based livelihood.

There is little evidence either that residents of LID are an economic burden on society.

LID in Wales currently enjoys an uneasy relationship with planning which hinges on LID usually involving residence on the site which planning seeks to judge as agricultural workers' dwellings. Almost always this judgement goes against LID. This should not be surprising. LID involves a subsistence-based and multifaceted land-based livelihood and the need to live on the site is for different reasons than for conventional farming. LID does not seek intensive rearing of animals, substitutes mechanical work with that of people and animals, exchanges fossil fuels and agri-chemicals for time, and substitutes the need to earn sufficient money to purchase life's daily requirements by harvesting most of them instead from the site. The functional and financial tests for agricultural workers' dwellings are therefore not equipped to judge the suitability or otherwise of this type of development.

The cursory examination of the sustainability attributes of LID in planning decisions to date is concerning. It is hard to avoid the conclusion that the planning system has yet to fully grasp sustainable development if the strong sustainability performance of LID is overlooked in planning decisions.

A definition of LID for the Welsh countryside

This study concludes that LID can make a significant, if modest, contribution to the sustainability of the Welsh countryside. Yet the planning system currently fails to 'see' this. A definition of LID is required for the planning system. LID is a multi-featured and intrinsically integrated form of development. A simple definition cannot capture this. Thus this study has developed a detailed themed definition with detailed criteria (Table 9.1). Only where the majority of the criteria are met can a proposal be identified as LID. Of key importance is that each proposal for LID should include an integrated site management plan dealing with issues such as environmental management, the livelihoods of the site's residents, the nature and use of buildings, transport and energy use, *and how such elements are interrelated in the overall management and use of the site.*

This definition does not distinguish locations where LID should or should not take place. Rather, through the use of criteria, it recognises that development can take a variety of forms in different locations, and still fulfil the requirements of LID. *Such is the pressure for development in the open countryside, particularly new houses, that it is also essential that LID is properly controlled. This study concludes that detailed planning obligations are the most appropriate means of control for LID. These should have two elements: measures to ensure the ongoing integrity of the LID, and, should it 'fail', means to terminate the LID and ensure that no other development can proceed on the site.*

Recommendations

It is recommended that criteria-based national and local planning policies be developed for LID in rural Wales. Detailed suggestions for policy content are given.

It is also recommended that planning obligations are used as the principal means of control for LID in rural Wales. Detailed suggestions for their use are given.

Taken together these recommendations set an unusually demanding test for LID. Those wishing to undertake LID should realise this and the demands that LID will place upon them. Bogus or insufficiently low impact proposals should fail.

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1. INTRODUCTION

1.1 This research, commissioned by the Countryside Council for Wales in association with the Welsh Assembly Government (Assembly Government) and the Pembrokeshire Coast National Park Authority, is concerned with Low Impact Development (LID) in rural areas and the planning issues that relate to it.

Aim

1.2 The aim of this study, as set out in the research brief, was to:

Investigate the impacts of LID and investigate if primary or secondary legislation or national planning policy needs to be modified to take account of LID and if so, how.

Objectives

1.3 Accordingly, the objectives of the study, as set out in the research brief, were to:

- i. *define Low Impact Development and Permaculture*
- ii. *identify best practice and developing trends / issues (within a European context) and select at least three sites which are working examples of a range of approaches to LID;*
- iii. *carry out a sustainability appraisal of the sites chosen. The research should investigate low impact development against the four objectives of sustainable development. This should include identifying conflict between objectives and potential 'global' and 'local' impact;*
- iv. *informed by this appraisal, consider the potential economic, social and environmental effects (both benefits and disbenefits) of LID, its relationship to traditional agriculture and farm diversification and its potential implications for Welsh culture and ways of life;*
- v. *consider the appropriateness of current planning legislation and policy in Wales in dealing with LID;*
- vi. *advise and make recommendations as necessary to inform the review and development of planning legislation, policy and guidance and to consider implications for related regulatory controls.*

What is Low Impact Development² (LID)?

1.4 Low Impact Development (LID) has been defined by Farlie (1996) as:

"One that, through its low negative environmental impact, either enhances or does not significantly diminish environmental quality"

² the word *development* in the term Low Impact Development should not be taken as synonymous with the definition of *development* for planning purposes

For rural Wales, though, the term Low Impact Development has become closely associated with types of rural settlement typified by modest dwellings whose occupation is closely linked to the management of the land on which they stand.

1.5 The report *Farm Diversification and the Planning System* for the Assembly Government (2001), briefly examined LID, and summarised it as follows:

"Low Impact Development is intended to be more than the utilisation of more sustainable building technologies and land management techniques. Although subject to many permutations, it essentially defines a form of subsistence-based development made up of a combination of a dwelling and the land to support it, which are managed together in such a way as to give high self-sufficiency in food and other naturally-occurring resources, and to maximise the wider environmental benefits of habitation on the site. As such, Low Impact Development describes a lifestyle as much as physical forms of development."

1.6 Thus many elements of LID fall outside the planning system as they are either agriculture or forestry. Residence on the site, though, requires planning permission.

1.7 LID is not directly addressed in national planning policy, nor in most development plans. Planning applications for LID are usually judged as applications for agricultural workers dwellings, whose criteria they usually fail.

1.8 Both the Rural and Countryside Working Group of the Land Use Planning Forum of the Assembly Government and the conclusions of the report *Farm Diversification and the Planning System* recommended that further research be undertaken into the implications of LID for Welsh planning policy and legislation. These recommendations led to this study.

Research method

1.9 In response to the brief, this research has involved:

- a literature review, encompassing LID directly, Permaculture and associated topics;
- a review of national, and local planning policies in the UK: those directly addressing LID and also contextual policies;
- interviews with national consultees (listed in **Appendix 1**) on the understanding of LID, its nature and extent in Wales, and LID and the planning system;
- an assessment of the Human Rights issues raised by LID;
- a questionnaire survey of LID residents and those recording an interest in LID in Wales (using mailing lists from Chapter 7, The Federation of Low Impact Dwellers and The Eco-Villages Network UK);

Detailed questions were asked about the characteristics of LIDs, the residents, and planning matters;

- visits to five LID case studies and one 'control' case where the environmental, social and economic features and planning aspects of the LID were investigated through fieldwork and interviews;
- a sustainability appraisal of each of the five case studies.

1.10 The research has been completed by the University of the West of England (leading) and Land Use Consultants. In addition, the Permaculture Association,

Chapter 7 and Murray Hunt of Matrix Chambers have made contributions to this study.

Structure of this report

1.11 This report is divided into two parts:

Part A: Background: provides context to the remainder of the study. It contains chapters that describe Permaculture and Low Impact Development, informed by the literature review and looks at the planning policy context to Low Impact Development (LID).

Part B: Findings: sets out the findings of this study based on consultations, the postal questionnaire and the review of case studies. It looks at the understanding of LID in Wales; the nature and extent of LID in Wales; and describes a detailed review of five LID case studies in Wales which are assessed within a sustainability appraisal. This is followed by a chapter that looks at the treatment of LID by the current planning system. Finally, the report ends with a detailed discussion of the findings from this study and makes recommendations for the future.

PART A
BACKGROUND

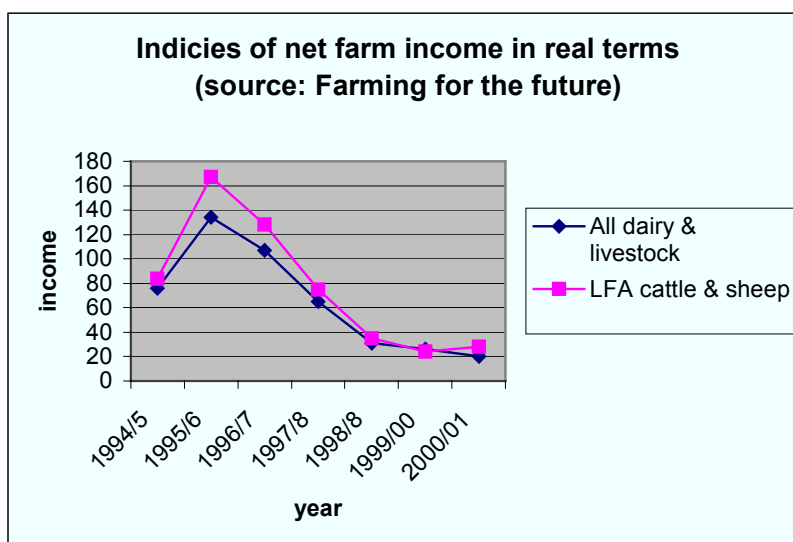
2. CONTEXT

2.1 Rural Wales is in a period of economic, social and environmental change. Many areas of policy affecting the Welsh countryside are also changing

Welsh agriculture and the rural economy

2.2 Welsh farm incomes have been in dramatic decline since the mid-1990s as the combined impacts of falling subsidies, falling world commodity prices, the strength of the pound, the BSE crisis and finally the Foot and Mouth outbreak have conspired to reduce farm incomes to some 15% of their peak levels.

Table 2.1: Indices of net farm income in real terms (Wales)



2.3 By 1999 Welsh agriculture contributed only 1.2% to GDP (0.6% if direct subsidies are removed and close to 0% if indirect support is also removed) and employed 5% of the Welsh workforce. Between 1995 and 2000, 5,400 people were lost from the agricultural workforce which is now dominated by farmers, their spouses, managers and partners (87%). 77% of Welsh farmland is designated as Less Favoured Area (LFA), of which 26% is disadvantaged and 51% seriously disadvantaged.

2.4 The number of agricultural holdings in Wales is in long-term decline, and there has been a shift towards both larger and smaller farms. Since 1980 the number of holdings greater than 100 hectares has grown by nearly 60%, while the number of holdings of less than 10 hectares has also grown by over 40%. On the other hand, the number of holdings between 10 and 50 hectares has fallen by 30%, indicating a squeeze on the traditional small family farms of Wales. In addition, between 1981 and 1996 the number of full-time farmers has declined from 25,057 to 21,311 and the number of part-time farmers has increased from 9,618 to 13,600. But there appears to be little evidence of land abandonment.

2.5 In 2001 the future strategy for farming in Wales was published - *Farming For The Future A New Direction For Farming In Wales*. This emphasises the economic, environmental and social importance of Welsh farming. It notes that agriculture has multiple roles: food production, the management of the countryside for tourism and recreation, and maintenance of biodiversity. It notes:

"Farming is, therefore, a unique industry. The crux of the problem is that it is hard to match what people value from farming with how it can be paid for..."

2.6 It sets a new direction for Welsh agriculture, aiming for the following outputs:

- *"safe, healthy food and non-food products, produced with high standards of care for the environment and animal welfare and targeted much more closely on market opportunities to give farming families a better return*
- *a countryside which is visually attractive and rich in its biodiversity, archaeology, history and culture, not only for its own sake but for people's enjoyment and to help support tourism*
- *distinctive local food products as the basis for a cuisine which helps promote tourism*
- *which, through all the above, contributes to a positive image for Wales in the world".*

2.7 Almost in parallel the Agriculture and Rural Development Committee of the Assembly Government, in their report *Diversifying the Rural Economy* (2001), notes that:

"In particular, we must see the traditional farm base of the rural economy not only as the source of farm-based diversification in itself, but also as a base for new non-farm economic activities associated with converting and transforming its land, woodlands, buildings and environmental and human resources. Rural Wales needs to re-integrate its agriculture back into a more diversified rural economy so that it complements and stimulates non-farm businesses as well as placing itself on a firmer footing for the future".

They highlight that for too long development in rural Wales has not been considered in a sufficiently integrated way.

Rural housing

2.8 Currently there is not an accurate picture of housing requirements in rural Wales, but this is being progressed by housing requirement assessments being undertaken by some rural authorities - due in 2002. *Better Homes for People in Wales: A National Housing Strategy for Wales* (2001) goes on to note that:

"While many of the housing issues confronting our rural communities are similar to those of valley and urban areas, there are markedly higher levels of unfitness and disrepair than in other parts of Wales. In-migration and the purchase of second homes has been one of the most influential factors on community structures in some rural and coastal tourist areas of Wales, while Right to Buy sales have removed large numbers of dwellings from the social housing stock".

2.9 Although varying across rural Wales, there is a general need for more affordable housing in rural communities. Housing markets have become increasingly competitive as middle class housing choices have shifted to properties in the countryside, combined with the desire for a 'country' lifestyle. Thus providers of rural affordable housing have increasingly had to turn to planning mechanisms, such as rural exceptions policies (Gallent 1997; 2001). Nonetheless *A Housing Research Audit for Wales* (1999) also noted that:

"Issues in rural areas (for example, planning for housing or the management of dispersed stock or the operation of local partnerships) may be quite different

from the difficulties experienced in more urban areas. The distinctive nature of rural housing markets in Wales, and issues of Welsh culture, may need specific examination.... Views were also expressed about the desirability of more guidance as to how the need for affordable housing in rural areas could best be met”.

2.10 The complexity of providing affordable housing in rural areas is evident from the research literature. The issue of homelessness and rurality was explored by Cloke et al (2001). This study suggested that the significance of rural homelessness is often undervalued in both political and policy discourse, as well as in terms of public recognition. The 'hidden' homeless in rural areas may well be 'invisible' since they are not known about or surveyed. If social housing is scarce or absent, then villages risk losing their remaining young people and less affluent families (Bevan et al, 2001, Stirling, 2000).

2.11 Importantly *Better Homes for People in Wales: A National Housing Strategy for Wales* (2001), under the heading *Revitalising our Rural Communities* recognised the fundamental connection of housing to other elements of rural sustainability:

“Rural communities, by their often isolated nature, can suffer from poor access to mainstream services such as health care and public transport, and face a lack of local amenities which many of us take for granted. Encouraging long term rural sustainability requires an integrated approach that takes account of the specific social, economic and environmental factors in such areas”.

Social change

2.12 The population of Rural Wales³ has grown in recent years, increasing by 2% (16,000) between 1991 and 1999. This figure is in line with the rest of Wales, but if the excess of deaths over births is taken into account this figure hides a net in-migration of 32,000. However, the younger population (15-29) decreased by 9%, slightly less than the average for all of Wales (12%). The population over retirement age comprises 23% of the rural population compared to 19% for the rest of Wales. There are indications, though, that these figures may mask subtler changes within the rural population, such as migration from more remote rural areas to the urban centres within the area identified here as 'rural'. Work by the Welsh Institute of Rural Affairs has suggested that the out-migration of younger people from rural areas was more marked in the remoter parts of rural Wales between the censuses in 1981 and 1991.

2.13 Changes to Welsh rural communities, culture and the use of the Welsh language are a national policy concern. This is reflected in *Planning Policy Wales* (2002) which identifies the Welsh language as a concern for planning policy, reinforced by *TAN 20: The Welsh Language: Unitary Development Plans and Planning Control*, which states:

“The land use planning system should also take account of the needs and interests of the Welsh language and in so doing can contribute to its well being”.

2.14 *Planning Policy Wales* (2002) goes on to note:

“The countryside is a dynamic and multi-purpose resource. In line with sustainability principles, it must be conserved and, where possible, enhanced for the sake of its ecological, geological, physiographic, historical, archaeological and

³ defined as the nine most rural local authority areas (Anglesey, Gwynedd, Conwy, Denbighshire, Powys, Ceredigion, Pembrokeshire, Carmarthenshire & Monmouthshire) by the Agriculture and Rural Development Committee, *Diversifying the Rural Economy*, 2001

agricultural value and for its landscape and natural resources, balancing the need to conserve these attributes against the economic, social and recreational needs of local communities and visitors.” (2.4.5)

2.15 TAN 20 amplifies these concerns:

“Where the use of the Welsh language is part of the social fabric of a community, the needs and interests of the language should be taken into account in the formulation of the policies.

...

It should be the aim of local planning authorities to provide for the broad distribution and phasing of housing development taking into account the ability of different areas and communities to accommodate that development without eroding the position of the Welsh language.

...

Policies to ensure that there is a sufficient level and range of economic opportunities to support and develop local communities would benefit the Welsh language”.

Thus it is clearly intended that planning policy should address the concerns that changes in Welsh rural communities might threaten Welsh language and culture.

2.16 Support for taking careful account of cultural issues in development also comes from Kneasfey et al (2001) who investigated the ‘cultural economies’ of rural West Wales. One of the important characteristics of the region is the dominance of self-employment and ‘micro’ businesses due to substantial in-migration, with a corresponding outflow of young people. There are fears that the change away from the traditional agricultural base, increasing numbers of older people and loss of skills, present a threat to regional cultural identity.

2.17 Banks and Marsden (2000) looked at the contribution of agricultural conservation schemes such as Tir Cymen to diversifying the rural economy. They note the importance of such schemes in both supporting local employment and managing the countryside to the benefit of local inhabitants and tourists.

2.18 Huggins (2001) examined the development of the skills economy in mid Wales where the expectations of employers, employees and those outside the workforce were used to assess the existing and develop the potential skills base of the area. Training provision is identified as particularly important in a climate of depopulation, transport difficulties and crises in agriculture.

Sustainable development

2.19 *A Sustainable Wales - Learning to Live Differently* (2000), the strategy for sustainable development in Wales, defines sustainable development as follows:

“The National Assembly for Wales will promote development which meets the needs of the present without compromising the ability of future generations to meet their own needs. This means that we should treat the Earth as though we intend to stay”

2.20 The strategy goes on to adopt the UK objectives for sustainable development:

- *"social progress which recognises the needs of everyone*
- *effective protection of the environment*
- *prudent use of natural resources*
- *maintenance of high and stable levels of economic growth".*

These objectives are then expanded at length in *Planning Policy Wales (2002)*.

The achievement of sustainable development is a central concern of this report and its relationship to Low Impact Development is considered at length through the remainder of this report.

3. LOW IMPACT DEVELOPMENT (LID)

3.1 This chapter introduces Low Impact Development (LID) by reference to existing literature and discussions with proponents of LID. Planning policies which have been developed to address LID are considered in the next chapter.

3.2 In the context of the UK, Chapter 7 (the planning office of The Land Is Ours, a land rights campaign, see <http://www.oneworld.org/tlio/>), estimates that between 5% - 10% of all cases of LID are in Wales.

Definitions

3.3 Fairlie (1996) defines Low Impact Development as:

"development that, through its low negative environmental impact, either enhances or does not significantly diminish environmental quality."

3.4 In the introduction, it was outlined that as much as describing the physical form of a development, LIDs also embody a particular type of livelihood. LID is a social as much as a physical phenomenon, reflecting current concerns and aspirations amongst a proportion of the population. While, by definition, there is nothing restricting LID to land-based activities such as agriculture and forestry, in practice the majority of LIDs do embrace an element of land-based activity. These issues are discussed at length in *Low Impact Development* (Fairlie 1996) which is the seminal work on the topic. Chapter 7, reports that the overwhelming majority of people wishing to set up some kind of LID in the countryside are already involved in either full-time or part-time land-management activities.

3.5 Moyse (1999) in his overview of low impact development, provides a slightly different definition of low-impact dwellings or settlements where *"the ghost acreage is minimised, or, at the very least, brought below the national average by reducing the consumption of goods and materials and the production of waste"* (p90), essentially reflecting the desire to minimise environmental impact through reducing the environmental footprint of development.⁴

3.6 In the remainder of the report LID is specifically and only taken to represent those developments where there is a clear and direct link to land management.

Origins and influences

3.7 The low impact development movement, as it exists at present, can be traced back to a number of social and philosophical influences as follows:

- *Sustainable Development*: Increasing concerns about the sustainability of modern consumer lifestyles in the industrialised countries, have led a number of people to seek for themselves lifestyles that are less demanding of resources. For some this may mean living in a humble dwelling, deriving energy from renewable resources, recycling waste at home (in accordance with the proximity principle), avoiding pollutants, and producing some of their food themselves. Such aspirations are common in those seeking to establish a LID.

⁴ The environmental footprint of development is a measure of the total environmental impact of the development, not just that on the site. The Welsh Assembly Government is currently working on such an assessment for the whole of Wales.

- *Permaculture and similar activities:* In tandem with the quest for more sustainable lifestyles there has also been a surge of interest in forms of land management that are viewed to be more sustainable than conventional agriculture and forestry. These include, in particular, Permaculture (explained later in this chapter), and a range of traditional woodland management activities (Law 2001). Permaculture requires a closer relationship with the land managed than is currently demanded by conventional farming practices.
- *Small-holdings:* There is also a resurgence of interest in more conventional smallholding activities. A 1995 DoE research report (LUC) observed that as well as a tendency for farm amalgamations there is also a considerable amount of fragmentation into smallholdings. The increase in the number of small Welsh farms has already been noted in Chapter 2.
- *The Plotlands of the 1920s and 1930s:* The plotland settlements established between the wars have been well described by Hardy and Ward (1984). There are many similarities between the plotlands and modern low-impact projects: self-built architecture; low requirement for infrastructure; use of recycled materials; association with smallholding and similar enterprises; quest for a 'simple life'.

3.8 Most of the plotland settlements were destroyed or absorbed into mainstream development well before the advent of LID. Nonetheless, there is a direct link through still existing plotland settlements, in particular Carbeth in Scotland and Holtsfield and Owensfield on the Gower Peninsula in S Wales. The Holtsfield residents were threatened with eviction by its owner in the mid 1990s, but have been protected by a legal decision which accorded the chalet dwellers tenants rights (*R v Swansea City Council (ex parte Elitestone)*, 1993)

Theoretical work

3.9 The theoretical basis for LID derives in great part from the work of Chapter 7. The initial publication, *Low Impact Development*, by S Fairlie, published by Jon Carpenter in 1996, identified nine criteria for LID:

- *"is temporary*
- *is small-scale*
- *is unobtrusive*
- *is made predominantly from local materials*
- *protects wildlife and enhances biodiversity*
- *consumes low levels of non-renewable resources*
- *generates little traffic*
- *is used for a low impact or sustainable purpose*
- *is linked to positive environmental benefit."*

3.10 This led to the formation of a small ad hoc group which published the report *Defining Rural Sustainability* (TLIO 1999). This lists 15 criteria for assessing land-based low impact projects, and suggests a number of model local plan policies.

The fifteen criteria are as follows:

- 1 *The project has a management plan which demonstrates:
a) how the site will contribute significantly towards the occupiers' livelihoods;
b) how the objectives cited in items 2 to 14 below will be achieved and maintained.*
- 2 *The project provides affordable access to land and/or housing to people in need.*
- 3 *The project provides public access to the countryside, including temporary access such as open-days and educational visits.*
- 4 *The project can demonstrate how it will be integrated into the local economy and community.*
- 5 *The project can demonstrate that no activities pursued on the site shall cause undue nuisance to neighbours or the public.*
- 6 *The project has prepared a strategy for the minimization of motor vehicle use.*
- 7 *The development and any buildings associated with it are appropriately sited in relation to local landscape, natural resources and settlement patterns.*
- 8 *New buildings and dwellings are not visually intrusive nor of a scale disproportionate to the site and the scale of the operation; and are constructed from materials with low embodied energy and environmental impact, and preferably from locally sourced materials, unless environmental considerations or the use of reclaimed materials determine otherwise. Reuse and conversion of existing buildings on the site is carried out as far as practicable in conformity with these criteria.*
- 9 *The project is reversible, insofar as new buildings can be easily dismantled and the land easily restored to its former condition.*
- 10 *The project plans to minimize the creation of waste and to reuse and recycle as much as possible on site.*
- 11 *The project has a strategy for energy conservation and the reduction, over time, of dependence on non-renewable energy sources to a practical minimum.*
- 12 *The project aims over time for the autonomous provision of water, energy and sewage disposal and where it is not already connected to the utilities, shall make no demands upon the existing infrastructure.*
- 13 *Agricultural, forestry and similar land-based activities are carried out according to sustainable principles. Preference will be given to projects which conform to registered organic standards, sustainable forestry standards or recognized permaculture principles.*
- 14 *The project has strategies and programmes for the ecological management of the site, including :
a) the sustainable management and improvement of soil structure;
b) the conservation and, where appropriate, the enhancement of semi-natural habitat, taking into account biodiversity, indigenous species, and wildlife corridors;*

c) the efficient use and reuse of water, as well as increasing the water holding capacity of the site;

d) the planting of trees and hedges, particularly in areas where the tree coverage is less than 20 per cent.

15 *The project can show that affordability and sustainability are secured, for example, by the involvement of a housing association, co-operative, trust or other social body whose continuing interest in the property will ensure control over subsequent changes of ownership and occupation.”*

3.11 These criteria are considered again in the discussion in chapter 9 of this report.

3.12 Further ideas and information about LID are also put forward in the publication Chapter 7 News which has a print run of 500 and a subscriber base of 370. Other planning-related work on Low Impact Development has been produced by: Peter Carpenter (relating to earth sheltered buildings); Rob Hopkins, a student at UWE (permaculture projects); Lucy Nichol at Oxford Brookes University (earth shelter, forestry issues and food links issues); Hockerton Housing Project (communities); and Sustainable Communities Ireland (farm villages). Details of these publications are included in the bibliography.

LID and the planning system

3.13 As set out in the next chapter, national and local planning policies do not currently address Low Impact Developments (with some notable exceptions). In consequence, as there is a presumption against new development in the open countryside in national planning policy, rural LIDs, where they have been addressed by planning, are usually judged against the exception policies for agricultural workers dwellings.

3.14 In a number of cases to-date LIDs have evolved without making a planning application or have subsequently been subject to enforcement action. In other cases the fifteen criteria identified by Chapter 7 have been presented as evidence in planning applications and appeals, and have been proposed (unsuccessfully) as the basis of s106 Agreements. They have also been used in a number of feasibility studies, such as that for the Lothian Lowland Crofting site; and their influence is clear in the 10 criteria put forward in the Milton Keynes local plan policy (discussed in the next chapter).

Sustainable building

3.15 Work on more sustainable building technologies is separate but closely linked to LID, as most LIDs seek more sustainable solutions for their building needs. Sustainable building is a large field in its own right and is no more than outlined here, though it is revisited in the consideration of the case studies in chapter 8.

3.16 The Town and Country Planning Association (TCPA) has promoted a series of articles on approaches to building more sustainable housing, which are used here as signposts to the wider debate.

3.17 Burrall (2001) reports on the findings of the UN's Inter-governmental Panel on Climate Change meeting in January 2001 and the necessity for governments to act quickly since a cut of between 60 and 80 per cent in global emissions of CO² will be required by 2050. In the UK per capita emissions of CO² are the fourth highest in

the world, with housing accounting for around a third of this total. Thus there is a considerable challenge to reduce domestic energy consumption. Burrall concludes that the concept of mainstreaming sustainable housing is a very long way off, and will require political leadership and intervention to kickstart the process.

3.18 Roaf & Rockwood (2000) consider that the obstacles to higher domestic energy efficiency are no longer technical and highlight the need for awareness raising to emphasise how energy efficient housing could help reductions in national emission levels. The 'Roaf' house, a prototype built in Oxford is described as an example of building to sustainability standards. It produces just 140kg of polluting carbon dioxide a year, compared with an average of 6,520kg for a household of four in a house of similar size built to 1995 standards, as well as having dramatically lower fuel bills.

3.19 The process of improving the environmental performance of buildings within the UK is described by Clark (2000). A number of innovative examples are discussed including the Integer Millenium House at the Building Research Establishment in Watford. This was a deliberate attempt to design a low cost house that would meet the requirements of housing associations. One of the main hurdles to overcome is attempting to change people's attitudes towards energy-efficiency since it is so often associated with the more exclusive and expensive 'ecotech' development. Further demonstration developments are planned.

3.20 It is a general conclusion of the literature on sustainable buildings that a more positive lead from improved building regulations and planning guidance is needed. Some fairly simple changes that could help accelerate this process include:

- clarification of the circumstances in which sustainable building issues can be a material planning consideration; and
- support for detailed design at the site specific level.

Eco-villages and eco-neighbourhoods

3.21 The notion of eco-villages has been established for some time. Eco-neighbourhoods are a newer idea. Both share many similarities with LID but are essentially larger scale developments. Barton et al (2000) explore the potential for eco-neighbourhoods (or villages) searching for best practice throughout the world. They found that there was considerable diversity in scale, location, focus and implementation and a paucity of really innovative projects at the neighbourhood level.

3.22 Barton et al classifies two types of rural eco-village, one being land-based in rural hamlets or villages and involving farming, small-holdings, fuel crops and energy resources, and on-site tourism. The other is the 'farm village' (a typology first referred to in *Sustainable Settlements*, Barton, Davis and Guise, 1995) which is made up of a cluster of farm buildings where childcare, transport and farm/family equipment are shared. Other sustainable village projects are large enough to support basic retailing and social facilities, but are essentially beyond the scale of LID which is the focus of this study.

3.23 In Sweden Haraldsson (2001) has compared the performance of so-called 'eco-living' communities with more conventional ones using ecological footprint⁵

⁵ analysis of the environmental impact of a development (including all impacts off the site) to build up a picture of the total impact

analysis. It was found that there was only a small difference when comparing the building materials of the two (although it is important to be aware that energy saving and conservation measures in Scandinavia perform to much higher standards than in the UK). The principal concept of eco-living is self-sufficiency, and Haraldsson observes that the change in lifestyle of inhabitants is important, from being "*total receivers of resources towards production and recycling resources*".

3.24 This concept of 'footprints' is also referred to by Parry (2000) in his commentary on the Assembly Government's sustainable development strategy (*A Sustainable Wales - Learning to Live Differently*). He suggests that one urgent task for the Assembly and its agencies is to identify and scrutinise initiatives that are clearly unsustainable in order to help identify what is actually 'sustainable'.

Current examples of LID

3.25 *Lowland Crofting*: In Scotland LID has been encouraged by local authorities and government in the form of Lowland Crofting. In the 1990s West Lothian District Council initiated a number of Lowland Crofting schemes which took uneconomic farms in degraded areas, and sub-divided them to provide a number of small-holdings combined with a large area of newly planted woodland and a residual area of farmland. These sites are not allocated but the result of planning applications.

3.26 The project was viewed as at least partially successful, though there is little emphasis on living and working on the same site, or on subsistence and reducing environmental impact. A report (TPS 2001) has recently been produced for Lanarkshire, proposing similar lowland crofting schemes, though conforming to more stringent environmental criteria. A policy supporting low impact and low density development has been introduced into Scottish planning policy guidance (discussed in the next chapter). However, it must be stressed that this approach has been encouraged by the concentrated form of landownership found in Scotland, which is not reflected in Wales.

3.27 *Low Impact Communities*: In England and Wales, over the last seven years, there have been a number of attempts by low impact communities to put forward proposals for low impact development that might be acceptable to the planning system. These include:

- *Brickhurst Farm*, Kent: permaculture community, partial temporary planning consent 1995. Enforcement notice against change of use declared invalid at appeal 2001.
- *Tinkers Bubble*, Somerset: woodland/smallholding; planning permission. applied for in 1994, temporary planning permission for 5 years granted in 1999.
- *Kings Hill*; bender⁶ site in Somerset: planning permission applied for in 1994, given permanent permission in 2000, partly on Human Rights grounds.
- *Plants for a Future*: Permaculture project on land with outline consent for 28 holiday chalets; planning permission for LID refused except for one mobile home dwelling 2000.
- *Brithdir Mawr*, Pembrokeshire Coast National Park: community on a farm which includes the use of existing farm buildings as well as new low impact buildings;

⁶ tipis, benders and yurts are all types of tent.

one low impact dwelling granted as lawful use, one refused at appeal in 2000 (a case study discussed below).

- *Steward Wood*, bender site in plantation in Dartmoor National Park: Refused at appeal 2001. Enforcement appeal pending.
- *Hollywell Fields*, Buckinghamshire: Permaculture, box scheme; application pending, enforcement action initiated.

Smaller Scale LIDs

3.28 Over the same period there has been a large number of smaller-scale low impact and projects with which *Chapter 7* has been involved. These include: benders, yurts, earth-sheltered⁷ dwellings and conversions of small agricultural buildings. Over 80% are involved in some kind of agricultural, forestry or other land-based activity, on either a full-time or a part-time basis. Ten -15 % involve some kind of educational or tourist activity. Most are on land-holdings of over an acre. Very few are purely residential without any link to livelihoods but the extent to which they are true LIDs as defined in this report, with a clear link to the management of land, varies. The majority have been established without planning permission.

More Formalised LID

3.29 Aside from the Scottish Lowland Crofting experiments, all the developments so far described have been 'bottom up' or self-build developments where the developer and occupier are one and the same person. But there are a number of 'top-down' developments in the UK which could be regarded as low impact, at least in some respects, including:

- *Hockerton Housing Project*, Nottinghamshire: a terrace of five earth-sheltered houses in Nottinghamshire, with very low energy consumption and smallholding opportunities. These were given planning permission as an exception to development plan policies because of their sustainable aspirations.
- *Bed-Zed* - a suburban housing project in Sutton, South London with radically high environmental standards; planning permission granted as the development was not in conflict with development plan policies.
- *The Living Village*, Bishops Castle, Salop: an environmentally orientated residential development with a design based upon the principles put forward by Christopher Alexander.

It must be stressed that not all the examples cited above conform to the definition of LID used in this report, where there is a clear link between residential occupation and land management.

Permaculture

3.30 Permaculture of itself is not LID. Nevertheless it is a philosophy and practice that is often adopted by those pursuing LID and therefore is worth

⁷ a construction whereby a portion of the dwelling is 'buried' to assist with insulation

explanation. A fuller description provided by the Permaculture Association is set out in Appendix 2.

3.31 What is permaculture? Permaculture is an approach to designing land uses, houses, communities and businesses as sustainable systems. It seeks to maximise the range of sustainable outputs, whilst minimising the use of non-renewable resources and harmful unwanted outputs (wastes). It is strongly focused on multi-purpose outputs that can assist in achieving self-sufficiency, rather than producing a single crop, product or service.

3.32 Permaculture is achieved through adopting a series of principles which reflect natural, self-regulating systems. These principles are adapted to reflect local circumstances, knowledge and culture and are:

- *Create small-scale systems* using as little land as possible to meet human needs. This allows land and resources to be used efficiently and thoroughly. For example, simultaneously planting herbaceous, bush, and tree crops (all stages in a natural succession) helps to maximise the total yield.
- *Design for energy efficiency* by putting areas requiring most frequent maintenance closest to the centre of human activity; and by working with local micro-climates and slopes.
- *Put the 'right' things in the 'right' places* ie thinking about what should go together to achieve beneficial, synergistic relationships, such as collecting rain or grey water close to and/or up slope from the areas of use.
- *Provide several ways to support important functions.* This means ensuring that major needs such as wind protection and food production are met in a variety of ways to spread the risk. So a windy site might be ameliorated by a range of different techniques and shelter belts in different locations.
- *Make things multi-purpose* ie making the main constituents of a design serve a number of functions eg chickens can supply eggs, meat, feathers, pest control, fertiliser, biofuel heat and can prepare ground for crops.
- *Use biological resources* to minimise the use of non-renewable resources. For example: the use of biological agents to undertake pest control and sewerage treatment; the use of local natural materials such as wood, straw, reed, turf and willow to create structures; and the use of low or no tillage systems and permanent perennial planting to create a healthy soil, reduce run-off and erosion, encourage biodiversity, increase carbon sequestration and provide flood protection.
- *Recycling energy and other resources* to reduce the net loss of resources eg recovered heat can be used to warm water, provide frost protection, dry food crops, and germinate seeds. Equally local economic cycling is encouraged through LETS, farmers' markets, credit unions and other local trading. All of these help to optimise the proportion of resources and currency staying in, and serving the needs of, the local community.
- *Plan for polycultures* ie going for variety rather than monocultures, recognising that different plants benefit each other by occupying complementary spaces, fixing nitrogen, and attracting pollinators and beneficial predators. In human communities, a variety of skills, resources and services promote local exchange, synergy and greater resilience to external forces.

- *Incorporate edges* as, naturally, transition zones from one habitat to another are very productive as the changing environmental conditions support a greater variety of plant species.
- *Create space for wildlife.* Permaculture systems are designed to be more sustainable and biodiverse. By utilising the minimum amount of land for human needs it becomes much easier to allow space for wildlife.
- *Turn problems into solutions* through creativity and innovation to develop subtle and complex systems that are the most sustainable utilisation of a site's resources.

3.33 A central tenet of Permaculture is that human habitation forms an integral part of the overall landuse system, ensuring that resource use and wastes are minimised. If habitation is separated from the other landuses it becomes much more difficult to achieve resource efficiency and develop a way of life where human habitation is integral to how the overall site functions, for example, in terms of composting, the use of grey water, the development of community trading and the recycling of money in the very local economy.

3.34 It is in this link between habitation and land management that Permaculture reflects the definitions of LID provided in this report. It is also in this link that Permaculture challenges the presumptions in national policy around new development in the open countryside.

4. PLANNING AND LID

National planning policy in Wales

4.1 National planning policy in Wales, *Planning Policy Wales* (2002), does not directly address LID, and thus any proposals for LID will be considered under those other areas of national rural policy which might be seen to apply, including policies on sustainability, the countryside, conservation of natural and cultural resources, rural economic development, farm diversification and accommodation for rural workers.

Sustainable development

4.2 *Planning Policy Wales* (2002) addresses sustainable development and planning, stating:

"The planning system has a fundamental role in delivering sustainable development in Wales. In particular the planning system, through both UDPs and the development control process, must provide for homes, infrastructure, investment and jobs in a way which is consistent with sustainability principles." (2.1.5)

4.3 It goes on to list nine principles for sustainable development and 18 objectives for plan policies and development control⁸. The principles are:

- *"putting people, and their quality of life now and in the future, at the centre of decision-making;*
- *ensuring that everyone has the chance to obtain information, see how decisions are made and take part in decision-making;*
- *taking a long term perspective to safeguard the interests of future generations, whilst at the same time meeting needs of people today;*
- *respecting environmental limits, so that resources are not irrecoverably depleted or the environment irreversibly damaged. This means, for example, contributing to climate protection; protecting and enhancing biodiversity; minimising harmful emissions; and promoting sustainable use of natural resources;*
- *applying the precautionary principle. Cost-effective measures to prevent possibly serious environmental damage should not be postponed just because of scientific uncertainty about how serious the risk is;*
- *using scientific knowledge to aid decision-making, and trying to work out in advance what knowledge will be needed so that appropriate research can be undertaken;*
- *while preventing pollution as far as possible, ensuring that the polluter pays for damage resulting from pollution. In general the Assembly Government will seek to ensure that costs are met by those whose actions incur them;*

⁸ These objectives are set out in full in Chapter 2, as they have guided the development of the sustainability appraisal that we have used to assess the LID case studies reviewed as part of this study.

- *applying the proximity principle, especially in managing waste and pollution. This means solving problems locally rather than passing them on to other places or to future generations;*
- *taking account of the full range of costs and benefits, including those which cannot be easily valued in money terms, when making plans and decisions, and taking account of timing, risks and uncertainties". (2.2.1)*

Rural areas and the Welsh countryside

4.4 Considering the priorities for rural areas *Planning Policy Wales* (2002) seeks rural areas with:

- *"sustainable rural communities with access to high quality public services;*
- *a thriving and diverse local economy where agriculture-related activities are complemented by sustainable tourism and other forms of employment in a working countryside; and*
- *an attractive, ecologically rich and accessible countryside in which the environment and biodiversity are conserved and enhanced."*(2.4.4)

It goes on to note that:

"For these aims and priorities to be realised it will be essential that social, economic and environmental policies are fully integrated. The preparation of integrated rural development strategies is recommended." (2.4.6)

4.5 Chapter 5 of *Planning Policy Wales* also covers protection of the natural heritage, biodiversity and landscape, National Parks, AONBs and other statutory and non-statutory designations.

4.6 Addressing agricultural land it states that *"the best and most versatile agricultural land, should be conserved as a finite resource for the future"* (2.8.1).

Housing in rural areas

4.7 Chapter 9 of *Planning Policy Wales* (2002) covers housing, including affordable housing, and Paragraph 14.3.1 addresses housing in rural areas:

"In planning for housing in rural areas it is important to recognise that development in the countryside should embody sustainability principles, benefiting the rural economy and local communities while maintaining and enhancing the environment. There should be a choice of housing, recognising the housing needs of all, including those in need of affordable or special needs provision. In order to safeguard the character and appearance of the countryside, to reduce the need to travel by car and to economise on the provision of services, new houses in the countryside away from existing settlements recognised in UDPs, or from other areas allocated for development, must be strictly controlled. Many parts of the countryside have isolated groups of dwellings. Sensitive filling in of small gaps, or minor extensions to such groups, may be acceptable, but much depends upon the character of the surroundings, the pattern of development in the area and the accessibility to main towns and villages." (paragraph 9.2.18)

Exception housing for agricultural workers' dwellings

4.8 Because of the general presumption against residential development in the open countryside, any such development has to be considered against current exceptions policies. As noted previously, the exception policy which currently has the closest "fit" with LID proposals is that for agricultural workers' dwellings, originally introduced to allow farmers and essential agricultural workers to live on or close to their place of work, as necessary for the proper functioning of the farm business.

4.9 Currently TAN 6: *Agricultural and Rural Development* (2000) gives detailed guidance on how such proposals should be considered:

"41. New permanent dwellings should only be allowed to support existing agricultural activities on well-established agricultural units, providing:

- (a) there is a clearly established existing functional need;*
- (b) the need relates to a full-time worker, or one who is primarily employed in agriculture, and does not relate to a part-time requirement;*
- (c) the unit and the agricultural activity concerned have been established for at least three years, have been profitable for at least one of them, are currently financially sound, and have a clear prospect of remaining so;*
- (d) the functional need could not be fulfilled by another dwelling already on the unit, or any other existing accommodation in the area which is suitable and available for occupation by the workers concerned; and*
- (e) other normal planning requirements, for example, on siting and access, are satisfied."*

"42. A functional test is necessary to establish whether it is essential for the proper functioning of the enterprise for one or more workers to be readily available at most times. Such a requirement might arise, for example, if workers are needed to be on hand day and night:

- in case animals or agricultural processes require essential care at short notice;*
- to deal quickly with emergencies that could otherwise cause serious loss of crops or products, for example, by frost damage or the failure of automatic systems."*

4.10 TAN 6 goes on to note that:

"46. New permanent accommodation cannot be justified on agricultural grounds unless the farming enterprise is economically viable. A financial test is necessary for this purpose, and to provide evidence of the size of dwelling which the unit can sustain".

4.11 Thus the two key tests for an agricultural workers dwelling under current national guidance are a functions test to establish need and a financial test to establish the economic viability of the farm business, ie to ensure the business is economically sound. The introduction of these tests proved necessary because of the considerable abuse of exceptions policies for development in the countryside, with people wishing to gain the significant financial advantage of a new dwelling in the open country.

Economic development and farm diversification in rural areas

4.12 Chapter 7 of *Planning Policy Wales* (2002) deals with economic development. Addressing rural areas, paragraph 7.3.1 states:

"In rural areas local authorities should prepare an integrated rural development strategy to facilitate diversification of the rural economy, seeking to accommodate both traditional rural industries and new enterprises.... Small-scale enterprises have a vital role in promoting healthy economic activity in rural areas, which can contribute to both local and national competitiveness. New businesses in rural areas are essential to sustain and improve rural communities, but developments which only offer short-term economic gain will rarely be appropriate."

Paragraph 7.3.3 goes on to consider farm diversification development:

"Local planning authorities should adopt a positive approach to development associated with farm diversification in rural areas".

In summary:

4.13 National policy establishes a policy framework in which LID is considered. This stresses the importance of an integrated view of sustainable development, respecting environmental limits and protecting environmental assets, supporting rural communities and a diverse rural economy (including farm diversification), and seeking to meet local housing needs while confining new housing to existing settlements, with an exception for agricultural and forestry workers' dwellings.

National planning policy in England

4.14 The situation in England is similar to that in Wales, where *PPG7: The Countryside - Environmental Quality and Economic and Social Development* (1997) sets out rural planning policy. Again there is strict control over residential development in the open countryside, with the main exception relating to agricultural or farming workers' dwellings, again subject to stringent functional and financial tests.

4.15 Nevertheless, in *Planning for Countryside Quality* (1998), the Countryside Agency also suggested:

"There may be a case for development which meets those needs which are unique to rural areas, including relatively isolated 'low impact developments' using appropriate local materials - eg for woodland management or Permaculture smallholdings. Effective mechanisms would be needed to prevent them becoming a Trojan horse for conventional development; these might take the form of covenants or leases, as in the lowland crofting model in the Central Scotland Forest".

National planning policy in Scotland

4.16 By comparison, In Scotland, national planning policy directly addresses LID in *National Planning Policy Guidance (NPPG) 3: Planning for Housing* (draft) (2002) and *NPPG 15: Rural Development* (1999), which reinforce each others' advice:

NPPG3

"59. NPPG 15 indicates that low-impact development, such as houses incorporating workspace, can provide both economic and environmental benefits. Developments using innovative, energy-efficient technologies with particularly low impacts on the environment may be acceptable at locations where more conventional buildings would not. The control of innovative low impact uses

through the planning system is best achieved by a plan-led approach. Proposals should be carefully assessed against specified sustainable development criteria and the wider policy objectives of the development plan”.

NPPG15

“Low density, low impact housing

29. Low density housing, sometimes referred to as ‘lowland crofting’, is one approach that has been adopted in the commuter area of West Lothian and could be emulated in other appropriate rural areas characterised by low grade agricultural land and degraded land. The policy promotes the restructuring of farms, with at least one third of the total area planted as native or amenity woodland, one third (the better farmland) retained in agricultural use (tenanted) and the remainder providing the land for about a dozen holdings of 1-10 hectares each. Occupants are encouraged to run businesses from them but there are restrictions on the type of businesses e.g. no heavy goods vehicles are allowed. The tree planting, public access and other planning objectives are usually secured by Section 75 agreements. The Central Scotland Countryside Trust, the body responsible for promoting the Central Scotland Forest (CSF), in conjunction with other bodies, has completed a review of the lowland crofting initiative.

30. Other smaller scale development with a low impact on the countryside environment, including for example craft homes and workshops, can provide both economic and environmental benefits. The regulation of innovative low impact uses through the planning system is best achieved by a plan-led approach to determine their scale and contribution to wider strategic objectives, followed by implementation by means of conditions and Section 75 agreements. In areas where the quality of agricultural land is low and the landscape is degraded, councils should actively consider promoting in their development plans, innovative forms of sustainable low density, low impact housing (along the lines of the West Lothian model) and small-scale economic developments”.

4.17 Thus Scottish national policy seeks to create a space for LID in countryside locations where other types of development would not be allowed. The detail of how such development might be judged is left to development plan policies (which are not yet widespread), though it is clear that the policy is trying to encourage development where people both live and work in the countryside, in ways which have a particularly low impact and which might also result in improvements to the rural environment. It must be recognised, however, that these policies in Scotland reflect a very specific cultural climate where crofting is a long standing national tradition with similarities to the aspirations of LID.

Local planning policies

Local plan policies in Wales

4.18 Most Welsh development plans, like the national policy, do not directly address LID. Each local planning authority in Wales was contacted to ask whether they had policies for and experience of Low Impact Development. The response to this request was slight - from only five authorities. One authority, with no policies, noted that although they had a certain level of sympathy with the ethos of LID they felt that LID should not be given preferential treatment over other residential development in the countryside and thus would not be looked on favourably. Such a view accords with that gained from the interviews with development control officers.

4.19 An exception is the Adopted Carmarthenshire District Local Plan. Following an Inspector's recommendation this mentions LID in the supporting text for policy CH9, covering exceptional new rural housing and agricultural workers' dwellings:

"There will be some cases, however, in which the demands of the farming or forestry work concerned may make it essential for one or more of the people engaged in this work to live at or very close to the site of their work. Whether this is essential in any particular case will depend on the needs of the farm or forestry enterprise concerned and not on the personal preferences or circumstances of any of the individuals involved.

The onus will be on the applicant to provide sufficient factual information to enable proposals to be scrutinised to establish whether the proposed dwelling is essential for the proper functioning of the enterprise. The aim is to attempt to prevent abuse of the concessions that the planning system makes for such dwellings. Proposals for 'Low Impact Development' must be in accord with the relevant policies and proposals of the plan".

However, Carmarthenshire County Council does not anticipate a policy on LID in their emerging UDP.

4.20 Pembrokeshire Coast National Park Authority and Pembrokeshire County Council have included a policy on LID in their Deposit Draft Joint UDP (2002):

"Policy 45 Low Impact Development

Low Impact development will only be permitted where:

- i) the development lies outside the National Park; and*
- ii) the development is well integrated into the landscape and does not have adverse visual effects; and*
- iii) opportunities to reuse buildings which are available locally have been investigated and shown to be impracticable; and*
- iv) the development is satisfactory in terms of its ecological management; its implications for biodiversity, waste, energy and resource management; private vehicle use; impact on the surrounding community, and economic activity; and*
- v) all buildings on site are of a temporary nature, using local materials where possible; buildings must be removed and the land restored to its original state within 6 months of occupation ceasing; and*
- vi) public access to the countryside and environmental education are integral parts of the venture; and*
- vii) any tourist activity associated with the venture will be restricted in terms of scale and time period; and*
- viii) detailed documentary evidence is provided which demonstrates that the venture has been planned on a sound financial basis which will meet its needs for the duration of the permission; and*
- ix) occupancy is restricted by legal agreement to those persons who are engaged in sustainable land use activity on the site.*

5.4.29 Low Impact Development is defined as development which through its low negative environmental impact either enhances or does not significantly diminish environmental quality. Low impact developments are likely to be small scale, unobtrusive, made from predominantly local materials, protect wildlife and

enhance biodiversity, consume a low level of non-renewable resources and generate little traffic.

5.4.30 The main emphasis of this policy is that development of this nature will be temporary as this is still a relatively experimental form of development. The Authority will grant temporary permission until further analysis of this type of development and its impact has been undertaken.

5.4.31 A management plan will be a necessary submission as part of the application process. The management plan will provide the aims and objectives of the venture, outlining its programme of works for all aspects of the venture”.

4.21 At the Inquiry into for the Pembrokeshire Coast National Park Local Plan in 1998 the Inspector considered an objection that the plan contained no policy for sustainable development or a ‘model community’ in the open countryside. The Inspector noted that the distinction between settlements and open countryside was a fundamental tenant of national planning policy. He commented:

“The type of settlement being advocated is, as I understand it, that known as ‘permaculture’. This is a very interesting concept, but the objectors have not put forward any reason why such a settlement is appropriate in a National Park.... It is necessary to show why the presumption against development of a new settlement in the National Park should be set aside - and this has not been done. The fact that those interested in permaculture might prefer living there is not of itself an adequate reason for doing so.”

In consequence he recommended no modifications to the plan.

Local plan policies in England

4.22 In England three authorities have policies dealing with LID, though all are still at draft stage. These are South Somerset District Council; Torridge District Council, Devon; and Milton Keynes.

South Somerset Deposit Local Plan

4.23 In the ? section of the plan it is noted that:

“10.41 Some travelling people and others who wish to have an environmentally friendly low impact lifestyle live in traditional ‘benders’ or yurts which are temporary structures for which no traditional foundations are required and are made of natural materials. Low impact development in this context combines low visual impact with the use of renewable or local materials for construction of the dwellings and low resource use in everyday living. Facilities will be provided on site and works to connect the site to the utilities, ie drainage, electricity along with road works with metalled surfaces should not be carried out. Structures such as cabins and caravans are not included under this policy as they are the subject of separate and appropriate legislation. On the removal of the permitted structures, regeneration of the site to its former condition usually occurs over three to six months. As this policy covers a departure from the more usual forms of dwelling provision, permissions will only be granted on a temporary basis.

10.42 Where low impact dwellings cause minimal visual or environmental harm or harm to the residential amenity of adjacent properties and where the site can be restored to its former condition when occupation ceases, there will be objection in principle. Although the dwellings themselves may have relatively little visual or environmental impact, care must be taken to ensure that no harm is caused by

associated requirements such as vehicular access and car parking, sheds and domestic paraphernalia. To help ensure that this is the case, permitted development rights will be removed from the site. The site must also meet required environmental health standards. The District Council will seek to establish criteria which can be used to evaluate the success or otherwise of low impact dwelling sites.

Policy HG11

"Proposals for low impact dwelling sites will not normally be permitted unless:

- 1. All of the structures are temporary bender or yurt type structures, are not visually intrusive and their removal will allow the regeneration of the site.*
- 2. Vehicle movements, noise, fumes or any subsidiary business activities would not harm the residential amenities of the area.*
- 3. The site is reasonably well related to schools and other community facilities.*
- 4. No serious highway problems would result.*
- 5. The site includes the following facilities:*
 - A refuse collection point*
 - Access to a drinking water supply*
 - A satisfactory means of sewage disposal / management and surface water disposal.*
- 6. Landscaping schemes and / or land management plans are provided if appropriate.*

All permissions granted will be temporary to allow for review and assessment of the impact of the site."

Torridge District Local Plan Revised Deposit Version 2001

4.24 Text accompanying policy ECD5, agricultural development is as follows:

Small-Scale Agriculture

Holding of five hectares or under are not necessarily below the threshold for agricultural viability. It is recognised that legitimate agricultural development may be proposed in connection with:

- a) Small scale horticulture, which involves polytunnels and / or other managed growing environments normally close to markets / edge of town*
- b) Small scale intensive farming*
- c) Smallholdings, where there may be a requirement to grow crops or rear, raise or keep livestock principally for consumption by the operator; and*
- d) Small scale permaculture, where mixed agricultural practices often including organic farming may be combined with a low cost alternative lifestyle.*

Where the economic benefit of development is not transparent it needs to be demonstrated by additional information. Applicants may wish to submit an economic impact statement, a business plan containing an economic forecast, or a suitable feasibility study for example".

Milton Keynes Local Plan Deposit Version 2000

4.25 In the Milton Keynes Local Plan reference is made to LID in Policy A11 as follows:

"Low Impact Dwellings in the Open Countryside

Objective of policy: to allow only the most innovative and sustainable proposals for low impact dwellings in the open countryside.

9.51 *The government has made clear its commitment to sustainability and it is regarded as a material consideration in planning decisions. PPG7 contains advice about the importance of rural sustainability but advises local planning authorities to draw up detailed policies to set out what is regarded as sustainable rural development in the local context.*

9.52 *Policy H11 has been against this government policy and information in a recent report produced by the Rural Planning Group of 'The Land is Ours'. This report contains guidance to help decision-makers assess the sustainability of rural development projects in the countryside and advise on the means of ensuring schemes stay sustainable over time. The report has received support from a number of national bodies including the Town and Country Planning Association and Action for Sustainable Rural Communities.*

9.53 *The number of proposals that meet the criteria is expected to be very limited. They will need to be strictly controlled, by legal agreements and / or conditions to avoid projects lapsing into unsustainable or conventional housing development in the open countryside. The involvement of a housing association, co-operative or trust will help to ensure that the project stays true to its original principals over time.*

Low Impact Dwellings in the Open Countryside

Policy H11

"As an exemption to policy S10, planning permission may be granted for low impact dwellings in the open countryside, where the proposal meets all of the following criteria:

- i. Any structures will largely be self built using renewable or recycled building materials.*
- ii. Any structures will not be visually intrusive and can be easily dismantled and the land restored to its former condition.*
- iii. Built development incorporates the highest standard of energy efficiency, to achieve an energy rating of 10 on the NHER scale.*
- iv. It maximises the potential for energy, water supply, surface water drainage, sewage treatment, and waste disposal to be generated or managed on site.*
- v. It demonstrates how the number and length of trips by motor vehicles will be minimised.*
- vi. It will be partly self-sufficient in terms of food production and agricultural, forestry or similar land-based activities comply with sustainable principles.*
- vii. It will increase woodland cover and other wildlife habitats.*
- viii. The principal employment of residents will be on the site.*

- ix. *The development will be managed by a housing association, cooperative, trust or other mechanism to ensure control over possible changes of operation.*
- x. *The proposal includes a management plan showing how all of the above criteria will be met."*

4.26 In combination, these policies indicate the very limited, but emerging, criteria/tests, by which it is felt LID schemes should be judged.

Individual LID planning decisions

4.27 As noted above, the majority of planning decisions relating to LID in the UK to date have been considered in terms of the tests for agricultural workers' dwellings and often refused as a consequence. In chapter 9, this report discusses the appropriateness of this approach. To provide context to this discussion, two important cases are outlined below.

4.27 The first is concerned with the tests for agricultural workers' dwellings used in a case where Arthur Petter was refused permission by Chichester District Council, and subsequently lost on appeal, to live on a holding managed under Permaculture. The case was taken to the High Court in 1999 (Arthur Sidney Petter vs Secretary of State for the Environment OBCOF 1998/0725/4). Here Lord Justice Sedley commented:

"So here an unexpected but undoubtedly genuine application, by somebody living by what amounts to subsistence farming, requires not a rigid application of criteria designed for commercial agriculture, but a practical adaptation of those criteria to secure the underlying purposes of policy. I do not accept... that to do this is to introduce impermissible personal circumstances into the planning judgment. It is to make the best feasible approach to a necessary judgment on the future needs of the agricultural land in question".

4.28 In this case it was decided that there was no need to satisfy the financial test for an agricultural workers' dwelling in the light of the unusual functional circumstances. Thus Lord Justice Sedley concluded that the tests for agricultural workers' dwellings may not cover all cases where residence on a holding is an issue.

4.29 The second case for consideration is Tinkers Bubble in Somerset, perhaps the most well-known Low Impact Development in England. Following enforcement notices and the refusal of a planning application for the development in 1995, the proposals were taken to appeal. The Planning Inspector concerned, was minded to allow a temporary permission for three years for the development but the case was called in by the then Secretary of State for the Environment, John Gummer, and dismissed. Subsequently, a further planning application was submitted to South Somerset District Council in 1998 and allowed in January 1999 on a temporary consent until 2003.

4.30 The grant of permission in 1999 was not based on assessing the planning application simply as a number of agricultural worker's dwellings. Instead, the application was judged as a mixed use, involving residential occupation in connection with an alternative and sustainable lifestyle. Thus the residential occupation of the site was viewed in the context of the other features of the mixed use such as the management of the holding relying on residents on site and the temporary nature of the dwellings which could be easily removed from the site when no longer required. Accordingly the development was allowed on a temporary basis subject to conditions and a legal agreement incorporating a

management agreement for the site and annual reporting on the progress of the development. A copy of the legal agreement is attached at **Appendix 3**.

4.31 The change of heart of South Somerset District Council in this case was partly due to ongoing experience of this LID, where many of the anticipated problems had not occurred and the development had settled into, and largely been accepted by, the local area. The management plan, in particular, is a detailed example of how LID can be properly controlled and allowed to make important contributions to its local environment.

LID and the Human Rights Act 1998

4.32 The Human Rights Act (HRA) 1998 came fully into force on 2 October 2000. Its main relevance to LID is in cases of enforcement where the question posed is whether the action constitutes interference with both Article 8 (respect for private life, family life and home) and Article 9 (freedom of thought, conscience and religion) Convention rights of the residents of LID. This is weighed against the legitimate aim of protecting the rights of others (by preventing environmental harm) and whether local planning authorities should therefore take action.

4.33 The HRA demands a rigorous approach to enforcement action. The local planning authority is required to conduct an overt and structured assessment of the proportionality of the interference it proposes, by asking a series of connected but analytically discrete questions designed to isolate the justification for interfering with a Convention right and to assist the authority in deciding whether the interference ultimately is acceptable in a modern democratic society. Drawing on case law there are at the very least four questions which must be asked:

1. does the measure serve a legitimate aim (i.e. is the objective sufficiently important to justify limiting a fundamental right)?
2. is the measure rationally connected to that aim (ie can it in fact serve to further that aim)?
3. is it the least restrictive way of doing so (i.e. is the means used no more than is necessary to accomplish the objective)?
4. is it proportionate in the longstop sense that, viewed overall, the measure does not place too great a burden on the individual for the good of the community?

4.34 This structured exercise in assessing proportionality should be conducted by the authority with close reference to evidence concerning the sorts of factual matters that the Strasbourg Court has made clear are relevant to any assessment of the proportionality of an interference in this context: the impact on the individuals concerned, the availability and suitability of alternative sites, and so on.

4.35 It is important to note, though, that the underlying Convention does not expressly safeguard issues of sustainability and environmental protection. Thus the HRA does not advocate LID, it merely protects rights sometimes associated with it.

4.36 The Kings Hill bender community in Somerset is the only example of a LID being touched by the HRA to date. In dismissing an appeal against enforcement action to remove the community from their site, the Secretary of State said that he had taken into account the Article 8 rights of the community but declined to take a view as to whether enforcement action was incompatible with these rights. The High Court held this to be irrational and quashed the decision.

4.37 The appeal was re-opened and the Inspector held that refusing the appeal would be incompatible with both the Article 8 and 9 rights of the community. In allowing the appeal, however, the Secretary of State disagreed that Article 9 was engaged. He concluded that the HRA was a material planning consideration:

"interference with the appellants human rights under Article 8 ... coupled with the lack of significant harm to issues of public interest, particularly as regards landscape effects and traffic generation ... constitute material considerations sufficient, in the exceptional circumstances of this appeal, to justify determining the appeal otherwise than in accordance with the provisions of the development plan."

4.38 In this case, although the Secretary of State disagreed with his Inspector on the engagement of Article 9 rights (in this case the community's sincerely held beliefs about the importance of living in communion with nature) this remains an issue for LID.

4.39 A further consideration is whether planning policies for LID would be discriminatory and thus breach Article 14 rights (that no-one shall be discriminated against on any ground, including matters such as race, sex, national origin, or any other status).

4.40 Formerly policies for LID could set an exception to the prevailing presumption against development in the open countryside for those able to comply with the policy's requirements. Thus such people would be treated differently to others who might also wish to live in the countryside but could not bring themselves within the requirements for LID.

4.41 Article 14 rights would be engaged, then, but so long as this different treatment was **justified** as serving legitimate aims, achieved by **proportionate** means, they are unlikely to present obstacles to policies for LID.

4.42 It follows, therefore, that in the contour of the HRA, policies for LID should clearly address the nature of the exception to the prevailing presumption against development in the open countryside with detailed criteria and that there should be adequate means of control for LID to ensure that this justification remains intact. These issues are considered at length in chapter 10.

4.43 A full commentary of the implications of the HRA for LID is attached at Appendix 4.

PART B

FINDINGS

This section sets out the research findings of this study.

The findings start with consideration of the awareness of LID in Wales. Next the extent and nature of LID is investigated based on a national questionnaire survey. Five case studies are then identified, described, and are the subject of a sustainability appraisal. A control case, a farm where diversification has occurred, is also included. The planning history of the five cases is described.

Together these findings provide the material for the discussion and recommendations that follow in chapters 9 and 10.

5. AWARENESS OF LID IN WALES

5.1 As part of this study, consultations have been held with national bodies and organisations to ascertain the extent of understanding of LID and associated issues in Wales. The full list of consultees is included at **Appendix 1**. In general these consultations revealed considerable polarisation in the understanding of, and opinions about LID.

General understanding of LID

5.2 Understanding of the terms Permaculture and LID is very varied. The Eco-Villages Network UK (ENV-UK), the Federation of Low Impact Dwellers (FLID), Sustainable Communities Scotland (SCS), the Permaculture Association and Chapter 7 were all familiar with both LID and Permaculture, emphasising their sympathetic approach to the natural environment, holistic approaches to site design, the development of skills and resources, and the potential for LID to represent new forms of agricultural and rural diversification. The Scottish Executive, who have planning policy addressing LID, clearly identified LID as seeking more sustainable forms of settlement.

5.3 The National Farmers Union, Wales (NFU Wales), the Country Land and Business Association (CLA) and Friends of the Earth Wales (FoEW) had very limited or no knowledge of either concept.

5.4 The Countryside Council for Wales (CCW) was familiar with both concepts but wished to see better information on their sustainability impacts.

5.5 As would be expected those who were unfamiliar with LID were also unaware of the extent of LID in Wales, though the Centre for Alternative Technology and Brithdir Mawr were mentioned as specific cases. ENV-UK, FLID, the Permaculture Association and Chapter 7, unsurprisingly, were aware of many cases (and these organisations were used in this study to help establish the nature and extent of LID in Wales).

5.6 The Scottish Executive had little knowledge of Welsh examples, but were aware of projects in Scotland. Also, SCS noted that there is a great deal of interest in LID in Scotland, as it is often seen as an extension to the crofting tradition, particularly in the Highlands where James Hunter who was Chief Executive of the Highlands & Islands Development Board has been promoting rural resettlement.

5.7 The Scottish Executive also commented that they are seeking to provide a positive framework for LID, promoting rural diversification and encouraging innovative design. In turn, Scottish local authorities are identifying their own criteria for such development. SCS back up this view, suggesting that the Scottish countryside is at a crossroads, needing a new long-term solution for sustainable land use. They suggest that 'Crofting townships' of 10/20 households, based on forestry and agriculture (but with residents also having other employment) might be a part of such a solution.

LID and sustainability

5.8 Asked about the sustainability of LID, and particularly its relevance to agriculture. ENV-UK, FLID and Chapter 7 all suggested that in the face of current agricultural problems LID could offer alternative livelihoods in the countryside, combining economic, social and environmental benefits. Though LIDs are usually small and of modest output this could still be significant to the contemporary countryside. The Permaculture Association made the specific point that LID could offer an important route into agriculture for new entrants on smaller holdings, and could also be linked to the growth of local food initiatives.

5.9 Coed Cymru pointed out that in forestry there was an unaddressed grey area between forestry activities and timber processing, including charcoal production and small-scale manufacture of timber products. LID might bridge this gap in helpful ways. They also suggested that a lot of interest in such activities was from Welsh natives.

5.10 CCW was concerned that LID should make a genuine contribution to agriculture and the rural economy, and should support local people, not just incomers.

5.11 NFU Wales, FUW and CLA commented that LID could only represent a niche in agriculture, and was economically insignificant. More business development, adding value, and the development of alternative incomes, or 'hobby farming' were more important.

5.12 The Assembly Government, from the perspective of sustainable rural development, expressed qualified support for LID insofar as it might contribute to rural economies (leading to more people making a living from the land) and communities (particularly assisting age-balanced communities). In terms of sustainable development it was pointed out that too extensive use of rural land was not necessarily sustainable, but that Permaculture and LID were often characterised by more intensive use of land and hence could be more sustainable in terms of footprint. It was also suggested that the subsistence dimensions of LID might allow people to live in areas of rural Wales where it would otherwise be 'uneconomic' to do so, and thus, even though contributions to the local economy and support for local services, facilities and communities would be modest, this could nonetheless be significant. LID could be relevant to future planning choices in the context of increasing rural diversification.

5.13 The Assembly Government was very concerned that LID be adequately controlled to prevent abuse and the loss of these potential benefits. Thus, if LID is to be more directly addressed in policy it was felt that there should be clear mechanisms for control.

LID and planning policy

5.14 Addressing the planning system. ENV-UK, FLID and *Chapter 7* all argued that the planning system should be changed to better recognise LID in policy and decisions. The use of appropriate criteria was seen as crucial, both to recognise LID and to prevent bogus proposals. The Permaculture Association also suggested that the planning system might allow some experimentation, pointing out that Farmers' Markets began in a similar fashion. They also noted that LID can often give rise to clashes of perception, and that better explanation and consensus building should take place.

5.15 NFU Wales raised concerns about alternative lifestyles, drugs and dog worrying. The CLA suggested that all development in the countryside should be judged on similar grounds, including siting, density and impact on surroundings.

5.16 On the control of LID through the planning system, the organisations supporting LID did not oppose strict control but suggested that temporary permissions were not appropriate beyond the first few years of a project. It was stressed that LID should not be viewed with immediate suspicion and necessarily as a threat, and that clear criteria in policy to evaluate it and mechanisms to properly control it and make sure that the development remained true to its declared intentions were key to achieving such a change of perception. Planning conditions, legal agreements, overseeing organisations or trusts, a new use class, and removing agricultural permitted development rights, were all suggested means of control.

5.17 NFU Wales suggested that more guidance was needed nationally and locally, but also suggested that the anticipated low level of LID might not warrant it. The CLA asked the question *"Should the planning system make concessions?"*.

Demand for LID

5.18 Asked about the likely demand for LID and whether this would come predominantly from the Welsh or incomers, both NFU Wales and the CLA postulated that LID was mainly the choice of incomers. FUW qualified this by noting that people often moved to a new location to start LID, but that this may include moving from elsewhere in Wales. They also suggested that as LID was often connected with innovation this may colour perceptions of its 'alien' qualities. LIDEVN-UK suggested a 50/50 split, adding that demand would not be great, despite some predictions to the contrary.

Chapter 7 as the foremost advisors of LID residents and those planning LIDs, noted:

"In our experience the number of people seeking a home and livelihood in the countryside, either in a low impact dwelling or in a caravan or mobile home, is increasing. This is associated with a buoyant and probably growing interest in smallholding activities, a very noticeable increase in traditional woodland management, and a growing interest in other more diversified land-based activities."

The main reasons for people living in low impact and mobile dwellings are:

- (a) the dwellings are attached to land where an activity is being pursued;*
- (b) nearby housing is not affordable;*
- (c) the occupants do not want to live in bricks and mortar.*

If, as seems likely, interest in land-based activities continues to grow and rural housing values continue to increase, then it is very possible that demand for low impact dwellings will increase further”.

5.19 They also noted that in their experience LID is most often the choice of people from the locality, people sometimes with access to ‘uneconomic’ farmland who nonetheless wish to continue living in their home area. They also note, though, that incomers often bring helpful new ideas and so a combination of local people and newcomers can be beneficial.

5.20 The Permaculture Association made a further suggestion, that given the evidence of a ‘green brain drain’ to Portugal, Spain, and Ireland, the Assembly Government could promote green entrepreneurs. They also underline the importance of affordable rural housing and the loss of key elements of the rural population to urban areas. CCW also picked up this point, noting that incomers can push up property prices and encourage long distance commuting.

6. THE EXTENT AND NATURE OF LID IN WALES

6.1 In late December 2001 approximately 100 questionnaires were distributed by UWE to existing or potential LID dwellers in Wales. The circulation list was derived from the network of organisations directly involved in LID and rural eco-villages (*Chapter 7*, Eco-Villages Network UK, Federation of Low Impact Dwellers), including 20 sent to named contacts. A total of 40 responses was received: representing 22 existing LID sites in Wales, 11 planned LIDs (where 5 have already acquired a site), and four people who used to live on a LID in Wales.

6.2 The questionnaire asked about all characteristics of LID, the planning experiences of the respondents and their perceptions of the demand for LID in Wales.

A copy of the questionnaire is attached at **Appendix 5**.

Characteristics of LID

6.3 Twenty four responses were received from people living on a LID in Wales, including some multiple responses from some larger sites. Twelve were from people expressing a general interest in LIDs, including three architects and planners.

6.4 According to the questionnaire responses there are currently around 130 adults and 58 children living on (or attached to) a LID in Wales.

6.5 The size of LID sites is extremely variable, ranging from a 363 square metre earth sheltered dwelling, to four LIDs on sites between 7 and 12 acres, one on a 40 acre site, with the largest being roughly 180 acres.

6.6 A number of these LIDs are well known environmental and permaculture projects and community-based housing groups, such as Holtsfield - a collection of former holiday chalets near Swansea - and the Coed Hills arts project at Cowbridge:

"Coed Hills as a community began in 1996. Inspired by a group of art college graduates seeking group contact and space to create. Since then over 30 people have lived for a month or longer on-site enjoying interactive sustainable stimulation" (Coed Hills questionnaire response).

6.7 The majority of respondents have either built their own dwellings or adapted existing structures, some using caravans as temporary homes, adapting old railway carriages or building wooden cabins. Four of the LIDs involve reusing derelict farm buildings. All stressed the importance of using natural and local materials as well as recycled materials, wherever possible. Only a handful of the LIDs involved tipis, benders or other temporary structures, although in larger communities these temporary structures may be used to supplement accommodation within more conventional buildings.

"Previously and during the construction of the LID I camped underneath canvas for a total of two years. I live in a LID because it gives me the potential to provide for myself substantially more so than if I was accommodated in either a mortgage or rent agreement" (moveable horse drawn cabin).

Activities on the site

6.8 The activities taking place on Welsh LID sites are extremely varied. Some are organised as communities, some are not. Some are seen partly as demonstration sites for eco-design and buildings, land management and forestry projects. Others are more low-key.

6.9 Most of the LIDs produced some food produce and other products for their own consumption and for sale. Permaculture and organic production are common, including fruit and vegetables, honey, milk, hams, cider, health foods, and nursery plants and seeds.

6.10 On many LIDs coppicing, hedging and woodland management were an integral part of site activities. On larger sites there was the potential for growing animal fodder, selling firewood and woodland planting.

6.11 Craft or workshop activities include candle making, pole-lathing, art shows, sculpture, circus rehearsals, album and music recording and healing.

6.12 Community open days for local people and events for the wider community were also a common feature, as were a variety of education activities, including courses and school visits.

Buildings

6.13 Whilst the smaller LID sites may only have one small cabin or similar and some storage facilities, the average number of building on LID sites is between four and five. These range from temporary structures such as tipis and yurts to more substantial structures such as huts, cabins, self-built eco-homes and old farm buildings and cottages. The larger settlements had up to 15 buildings, with the largest comprising 27 wooden chalets.

6.14 Nearly all the buildings are used mainly for living and storage space, but larger sites often have additional communal buildings. Most are constructed from timber and various natural and recycled materials such as straw and turf, and earth. The very low impact tented structures are made of poles and canvas.

Habitat and land management

6.15 Six of the LIDs had some form of habitat management plan with three of these being formal woodland or forestry plans with Coed Cymru or the Forestry Commission. Another eight indicated that they had partial management plans or strategies and three were embarking or developing plans for their land, with just two responses from individuals on LIDs having no plans for land management, apart from vegetable production.

Landscape impact

6.16 Apart from one questionnaire response indicating that the current landscape impact was poor due to dilapidated buildings, the remainder of the comments suggested that landscape impact was an important consideration and that generally LIDs try to be unobtrusive and sensitively blended into the landscape through tree planting and siting of the buildings. Sometimes this aids the desire to keep the buildings undetected by planning authorities, but ensuring that buildings blend into

their surroundings is often stressed as a very important consideration by LID dwellers.

Water, energy and waste management

6.17 Of those respondents currently living on LIDs, nine had access to a mains water supply, nine used local spring water, one had a private supply, and one had bored two wells within their property.

6.18 Heating and energy use was extremely varied. Six of the LIDs noted that they used fossil fuels such as gas, coal and oil for heating, five used woodburning stoves for heating and cooking, one used a scavenger burner fed assorted rubbish, five had passive solar space heating and just two had a wind generator. A further seven had plans to improve their energy and waste use, such as fund raising for a wind turbine.

6.19 With regard to waste and toilet provision 11 LIDs had compost toilets, 4 had septic tanks, and 4 utilised a grey water system with reed beds.

6.20 Nearly all the respondents either composted waste material as well as recycling refuse, with one of the recycling sites being used as a local community demonstration project.

Produce

6.21 A very wide range of produce appears to be grown or made on LIDs. Vegetables, fruit and herbs feature most frequently, with 15 LIDs producing their own produce for consumption, seven of these selling produce locally or regionally, and one example selling 40 different products which are distributed by a LPG-powered van. One of the larger LIDs runs its own wholefood cafe. Meat, milk, cider and honey are some other examples of produce from site but to a lesser extent than fruit and vegetables. Crafts, furniture and sculpture as well as yurts made from local forestry products and firewood were a particular feature of many LIDs.

Transport

6.22 The majority of respondents placed great emphasis on more sustainable modes of transport, despite the difficulties of remote rural locations. Working on site was a common goal to reduce the need to travel. The larger LID projects often pool vehicles and aim to share trips in the most appropriately sized vehicle.

6.23 Cases where residents owned or rented chalet dwellings on large sites tended to have their own independent transport arrangements, and car use was much higher.

6.24 Fourteen LIDs had access to at least one car, one being through a community car share scheme and two shared 4 x 4 vehicles. Other vehicles mentioned were a tractor, bus, a van and LPG-powered hire-vans. Five horses were also reported as means of transport for either passengers or materials. At least five LIDs had access to bus or train services and three mentioned the use of bicycles, motorbikes and walking, while a few were able to make use of lifts from neighbours and local farmers.

"This is a problem in remote locations and I don't want a car. Looking at building a two seated transport pod with scooter running gear. A friend of mine is an innovator in this department"

"One 4 x 4 is currently used around the farm. One tractor is required. One small engined car used for local trips. We are well positioned for bus-stop and a train station".

Employment

6.25 While many of those living on LIDs combined living and working on the site through Permaculture, horticulture, forestry with other self-employment activities on-site, some also had paid employment off-site. Employment activities are extremely varied. Of the total 24 LID dwellers responding to the survey 22 were employed in some capacity, sometimes combining paid employment with the trading of goods and services.

"Two of us work for the co-operative doing lots of varied things. The services we offer include woodland management, tree planting, hedge laying, coppicing and wholesale vegetable delivery to events".

"I work with a team of tree-surgeons doing our best to look after the trees rather than chop them down. We do a lot of tree planting also. I work part-time, I also work part-time on a Ropes challenge course designed to help stressed out businessfolk".

Table 6.1 : Types of Employment on Welsh LIDs

<i>Occupations of those living on a LID</i>	
People-centred occupations	Carers, health services, homeopathy, healing and complementary health services, special needs, child-care
Environmental related occupations	Civic amenity attendant, visitor centre supervisor, blacksmith, tree surgeons, stone carver, wholefoods, permaculture, horticulture, fruit and herbs, gardening, forestry, coppicing, livestock horse training, New Deal forestry and horticulture on-site training, Eco-Centre, stone masonry, stone walling, hedge laying
Arts and educational related occupations	Internet setups, sculpture commissions, events and exhibitions organisation, furniture and craft production, sacred geometry, cd's and music albums, education and recreation, teaching and lecturing, artist/illustrator
Other	Travel agency, marketing, student, civil servant, building and casual labour
Unpaid work	Forestry trust, and various voluntary work
Planned ideas not yet implemented	Pony trekking, Yurt safaris

The two chalet sites stood out as exceptions, as the majority of residents worked off site, as there was no large land holding.

Local linkages

6.26 The majority of questionnaire respondents emphasised that they had good links with and made use of local services and facilities such as the local shops, schools, pubs, with just a couple of LID dwellers being too isolated to take advantage of community networks, or not wishing to socialise. The vast majority considered that they were well integrated and accepted by surrounding neighbours and communities. Only a handful had experienced difficulties in relations with the local community, or felt that there was some hostility towards their lifestyle.

"When possible we use the local shop. We take delivery of a box of veg from local organic box scheme".

"Local wholefood shops especially, all the local shops a bit. We are very linked to the neighbouring farm which gives us grazing and some employment."

"When and where possible local services are always used. e.g. local pub. Coed Hills is a resource to schools and the community as a whole, studying ecology, biology and geography of the site and more contemporary issues such as alternative housing, music etc".

Welsh language and culture

6.27 A total of 32 LID residents were Welsh speaking, with significantly more being Welsh by birth. 19 were learning Welsh, though children were learning Welsh at school. 77 recorded that they did not speak Welsh.

6.28 A number of both Welsh and English people were learning to speak the language. While age was not requested on the questionnaire it is apparent from the responses that all age groups are wishing to live on LIDs from young single people, to families, as well as more mature couples. Where origins were stated, 54 people were Welsh, three were half Welsh and 66 adults and four children were from elsewhere. It is not always the case that the Welsh speak Welsh and visa versa.

6.29 Amongst those planning LIDs, 12 were Welsh speaking, five learning Welsh and 14 did not speak the language. Twenty two people recorded themselves as Welsh, and 18 from elsewhere.

6.30 The residents of a number of LIDs, large and small, made the point that through their land-based and craft work, and their community activities such as serving on committees and cooperatives, teaching local children and running education events, music making, recording and holding concerts, dance and other arts activities, and through the local nature of their lifestyles, they were making important contributions to local rural communities and culture.

Reasons for moving to LID / previous home

6.31 Information about previous living arrangements was only provided in some cases. Fourteen residents stated that they had previously lived in Wales, six in private rented accommodation and five moving from other LID sites (other origins were not specified).

6.32 A significant number of people with plans for a LID were Welsh by birth and wished to return to Wales, but found themselves excluded from the housing market. Eight came from other parts of the UK, and three from overseas including Australia and New Zealand.

6.33 Reasons for choosing to move to a LID were quite wide ranging from those who aspired to a more sustainable and holistic lifestyle, to those seeking an opportunity for low cost housing, as well as those wanting to renovate old properties. A significant number had moved to take up year-long training opportunities. All appeared to value the opportunity for living close to nature and developing a self-sufficient livelihood:

"Improve efficiency of site, reduce need to travel, previous accommodation became unavailable, allow intensive management of gardens and livestock and thus increase yield".

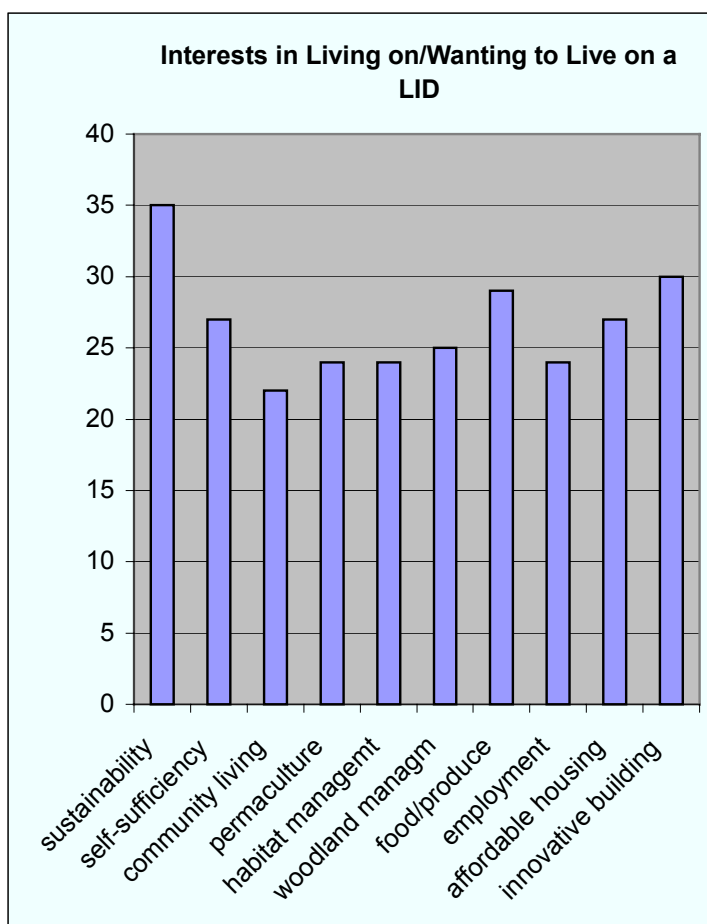
"I am committed to exploring ways of living in harmony with the earth. I do this in response to the environmental crisis our society is currently in. I have lived simply, on the earth for 9 years now: first in Tipi valley, then in a second community in Wales. Now I have come here to start a new project".

"Short stays at other eco-communities in France and Britain. Lived three years low impact on other people's farms. Then had children and got trapped on relying on the state benefit system without access to affordable land/housing".

"Have found simple housing in Wales too damp, expensive and badly designed. Lived in five agricultural workers houses before deciding to build one of my own".

6.34 In summary, the reasons for living/wanting to live on a LID are as follows:

Table 6.2 : Interests in Living on/Wanting to Live on a LID



6.35 As can be seen sustainability is the most popular reason, followed by innovative building, but all elements are well-represented. Community living is the least popular.

6.36 There were twenty-three entries in the 'other' open columns, with some respondents mentioning more than one issue. These ranged from issues relating to the site and its context, such as lack of traffic, reviving interest in the vernacular, appropriate technology, zero energy and maintenance, and recycling. However, there were more comments relating to personal satisfaction such as maximising potential, self-reliance, biodynamics, spiritual connections, creative scope, less stress, psychological and physical well being, quality of life and fulfilment, as well as integration with the local community. Only one person recorded a desire to be 'out of society'.

The planning system

6.37 This section of the questionnaire was specifically aimed at those LID dwellers with experience of the planning system, as well as consultants, architects and others with first-hand knowledge of the planning process. Respondents were asked to explain the planning history of their site and their views on the planning system's treatment of LID.

6.38 Much of this information has been provided to UWE as being sensitive, although fewer respondents than expected have asked us to treat the material anonymously.

6.39 Common experiences of the planning system were enforcement action and unsuccessful planning applications for LIDs. This has led to some efforts to 'hide' from the system, but the majority of LIDs are not secret.

6.40 At least five appeal cases were described, and one site was facing an injunction after earlier Article 4 enforcement notices, although this was not a conventional LID.

Views on the planning system

6.41 Amongst the respondents there was considerable frustration with the planning system. It was a common observation that whilst individual planners can be sympathetic to LID they are hampered by the lack of local and national planning policy guidance.

6.42 It was also a very common observation that the functional and financial tests for agricultural workers' dwellings, create a 'Catch 22' situation whereby LID residents are asked to demonstrate that they are something they do not want to be. This is discussed later.

"If I remember correctly, we only filled in a small part of the planning application, for most of it was not relevant to a structure such as ours"

6.43 A professional involved in the planning process for over twelve years commented that the more objective arguments in favour of sustainability of energy use, building and so on, are mostly ignored by the planning process. There was also felt to be ignorance amongst planners about the objectives of LID.

6.44 Another comment was that two hundred years ago the countryside was alive with a diverse range of crafts, skills and traditions which have now been lost, and that planners should recognise that LID can help in their restoration.

6.45 There were also a number of comments referring to Simon Fairlie's book on LID, setting out the need for planning criteria against which LID can be assessed, and the opportunity for some of the larger demonstration projects to provide an exchange of ideas.

"the planning system could control them (LIDs) ..., by the intelligent application of criteria as recommended in Simon Fairlie's book".

6.46 It is also noted that there are many innovative and traditional energy saving and sustainable building practices emerging in the development of LIDs in Wales that could have wider application in future policy and development.

Experience of other 'official' bodies

6.47 According to the questionnaire responses, there is a fairly even mix between respondents who have been in contact with other official bodies, and those who have not. Examples of organisations consulted included voluntary services, the Prince's Trust, all departments of local Councils, LA21 officers, social services, the Police, ADAS, Coed Cymru, the Forestry Commission, and the Assembly Government. Most of the contacts appeared to have been helpful, with only a few reporting bad experiences.

"We deal with all sorts of official bodies in a variety of ways".

"We as a community have excellent relations with many other agencies and are part of the national ESA scheme. We show round visitors every week".

The need for integration of activities on site

6.48 Many respondents stressed the importance of living and working in one place so that resource use is minimised, particularly reducing the need to travel. The efficiencies that this introduces are identified as freeing both time and financial resources for other elements of the LID, such as habitat management and voluntary activities.

"For practicality, labour and material saving integration is obviously positive. Yes, there needs to be permanent residence to maintain energy levels. Also transport is minimised and interrelationship is a priority".

"This is a 165 acre farm run holistically and sustainably by a group of highly motivated people. The assumption that people should live and work in different places is the root of many unsustainable practices and policies".

"Coed Hills exists through the activities that take place - these are led by the people who live on the site - it works through the community it builds, the visitors it accepts / welcomes and the bodies it deals with".

The demand for LID in Wales

6.49 The questionnaire sought to explore the potential demand for LID in Wales, and any changes that this might bring to the Welsh countryside.

'Latent', 'hidden' and 'growing' were phrases used to summarise demand, although it was stressed that demand was unlikely to be overwhelming given the hardships of LID life.

In summary:

6.50 The survey received a detailed response. Over 180 people were identified living on over 20 LIDs in Wales. A number of distinctive features of LIDs in Wales have emerged including:

- a significant range of LID sizes, ages and community / family structures;
- a strong commitment to land-based activities and environmental management;
- a strong concern that the landscape impact of LIDs should be minimised;
- clear links to the provision of affordable housing;
- many low environmental impact buildings and structures;
- widespread production of food and other produce, mainly for subsistence but also for sale;
- provision of a variety of employment on site with some also working in the local area;
- craft activities and maintenance of traditional skills;
- widespread environmentally aware waste and water management;
- widespread use of renewable energy (including some energy autonomy) and efficient use of energy;
- low use of other resources and concentration of use of renewable resources;
- reduced personal transport needs, leading to significantly reduced use of cars;
- strong / harmonious links with local communities, services and facilities;
- roughly half of LID residents in Wales are Welsh, and over half are Welsh speakers or are learning Welsh;
- frequent education and training activities on LID sites;
- cultural activities such as arts, music, organising events and serving on local committees;
- strong arguments for the necessary interdependence of site activities, including living on the site;
- a concern that the tests for agricultural workers' dwellings do not provide a sound planning test for the suitability of LID developments;
- clear evidence that LID residents are well informed and strongly motivated in seeking a more environmentally-friendly livelihood and lifestyle;
- evidence of some latent demand for LID in Wales, but also suggestions that this would not be overwhelming if LID was controlled and abuse prevented.

6.51 In addition, the survey found little support for the often preconceived idea that LIDs are connected with travellers and traveller camps. People of all age groups including many families are choosing to adopt such a lifestyle, often due to the paucity of adequate housing opportunities in rural areas. They are looking for a permanent home, wishing to live in more environmentally sustainable ways, to provide for their own employment, and to contribute to the local rural economy.

6.52 It is important to note, however, that the range of development identified through this survey was wider than the specific definition of LID being used in this

study, where Low Impact Development is clearly and specifically linked with the management of land.

7. THE CASE STUDIES AND THEIR SUSTAINABILITY APPRAISAL

7.1 As part of this study five case studies have been selected for more detailed study from the sample of respondents to the questionnaire described in the previous chapter. These were all cases where some sort of development had taken place, and were chosen to throw light on the main issues identified by the questionnaire. They were also chosen to explore:

- reuse / management of existing farms
- creation of new smallholdings
- large and small sites
- well established and newer projects
- individuals / family groups
- community living
- variety of building types
- variety of products
- habitat management
- Permaculture
- sustainable energy / water / waste use / management
- education and training
- tested at planning appeal
- historical theme
- cultural theme

7.2 The case studies were:

Brithdir Mawr, Pembrokeshire Coast National Park

Coed Hills, Vale of Glamorgan

The Roundhouse Project, Vale of Glamorgan

Tir Penrhos Isaf, Snowdonia National Park

Tir Sisial, Ceredigion

7.3 Each case study was visited by a research team looking at all aspects, including ecology, landscape, buildings and technology, economic and social issues, and planning. Each case study was the subject of a sustainability appraisal to provide a systematic assessment of the sustainability 'performance' of LID in Wales.

7.4 In addition to the LID case studies, a diversified farm was also visited as a 'control'. This has not been examined in the same detail.

7.5 Before describing the sustainability appraisal, each case study is outlined in turn.

Case study overviews

Brithdir Mawr

7.6 Brithdir Mawr is a 67 hectare holding on a valley side in the Pembrokeshire Coast National Park, a little under 2 miles from the town of Newport. It is the home of a community, currently comprising 12 adults, seven teenagers and four children under 10. They live in a variety of buildings: the main farmhouse, three residential units in converted barns, one in an outbuilding, a geodesic dwelling 100m from the farmhouse and a roundhouse 350m away from the farmhouse towards the bottom of the valley. The main farm complex also contains a visitor's hostel, a workshop, two barns, a woodshed, a large bicycle shed and compost toilets for the complex.

7.7 All buildings used as dwellings, with the exception of the roundhouse, have or do not need planning permission. The roundhouse, though, was the subject of a recent planning appeal having been refused retrospective planning permission by Pembrokeshire Coast National Park Authority.

7.8 Across the holding around 22 ha are used for grazing, 5 ha for hay crops, 21 ha are woodland (8 ha left untouched, 8 ha managed for small-sized timber and the remainder coppiced for fuel and timber), 13 ha of wetland. In addition, there is 2.7 ha of new woodland and 1 ha of fruit and vegetable gardens. Other buildings on the holding away from the main farm complex include two recently-constructed timber-framed and turf-roofed barns, goat, cow and chicken sheds, a workshop and three poly-tunnels.

7.9 The holding is managed collectively by the community who all agree to work three days a week on the holding and have a variety of activities for the remaining time. Work on the holding includes gardening, tending animals, woodland work, building construction and maintenance.

7.10 Brithdir Mawr wish to retain the roundhouse although the appeal decision required that it be removed by the end of July 2002. Although the appeal was only concerned with the roundhouse as a case study the site is considered as a whole.

Coed Hills

7.11 The Coed Hills Rural 'Artspace' is on a 180 acre (73 ha) farm in the Vale of Glamorgan, of which approximately 100 acres (40 ha) is grassland with 80 acres (32 ha) of woodland, comprising coniferous plantation on an ancient woodland site, now predominantly larch and spruce, with some ash regeneration and occasional beech. The farm complex comprises a farmhouse and a collection of farm buildings. In addition the Coed Hills Rural 'Artspace' comprises a large traditional farm building which has been converted for residential purposes and a mixture of other uses including a café and studio space, a modern haybarn which has been converted to an artists' workshop and performance space, a building housing two compost toilets, and a number of structures and artworks in the woods.

7.12 The Coed Hills Rural 'Artspace' was established in 1996 by a group of arts graduates. It combines accommodation, workspace, exhibition space, recording facilities, woodland management, a library of varied resources, a café, courses, furniture and yurt manufacture and lime slaking to create an environment where artists, resident and visiting, can work and relax and which also has amongst its aims environmental management and rural regeneration. There are currently eight residents, though over 30 people have lived at the site since 1996. The Roam exhibition in the summer of 2001 attracted over 4,000 visitors. A similar event is planned for 2002.

7.13 Planning permission was not required for the conversion of the older farm buildings to residential and other mixed uses as the conversion had taken place more than four years before it came to the attention of the local planning authority. Officers have commented that they would have been minded to approve this development in any case. The conversion of the modern barn was permitted subject to conditions limiting its use to an artists' studio / workshop. The other structures on the site (known as 'retreat huts') have been inspected by an enforcement officer and no subsequent action taken.

7.14 The Coed Hills community wish to develop their work and would like to provide additional accommodation for members and guests.

The Roundhouse Project, Vale of Glamorgan

7.15 The Roundhouse Project is located to the rear of a 7 acre (2.8 ha) nursery in the village of St Hilary in the Vale of Glamorgan. Some of the nursery is still used for the production of fruit and vegetables but 4 acres (1.6ha) have now been planted with trees.

7.16 The building that is currently under construction is a replacement to an original roundhouse built in 1997. Retrospective temporary consent for the original roundhouse was granted in 1998 with the conditions that it should only be used for the purposes of research and limited educational use, should not be used for residential purposes and should not be connected to mains services. Temporary planning permission for the replacement roundhouse was given in 2000 until the end of 2002, subject to the same conditions. There is a history of applications for new housing on the land surrounding the Roundhouse, all of which have been refused.

7.17 The original Roundhouse was essentially a replica of the type of Celtic roundhouse that would have been found in the area. It was built using local materials by three local people on their return from university, one of whom had trained in archaeology. The nursery is owned by the parents of one of the builders. The building was used for community events and educational visits from local schools.

7.18 All three people have remained in the area and are building the replacement roundhouse, which is of a more substantial construction but still from local materials. They do not intend to live in the Roundhouse, as this would breach their planning permission. Ideally, though, they would like to live in the Roundhouse and manage the nursery land from it. They hope that the building will be allowed to stay beyond the end of 2002 (when the temporary permission runs out).

Tir Penrhos Isaf, Dolgellau, Snowdonia National Park

7.19 Tir Penrhos Isaf is a seven acre (2.8 ha) site in the southern part of Snowdonia National Park, some three miles north of Dolgellau. The site is a clearing within a forestry plantation (Forest Enterprise) at the bottom of a small valley. The site was once part of a larger forestry holding and contains a small stone barn.

7.20 The site has been owned by its occupants since 1986, who have developed it according to Permaculture principles. At the time of purchase they applied for planning permission to convert the barn to a dwelling. This was refused. They also applied in 1989 for a new dwelling, which was also refused. Since 1991 the

occupants have lived on the site in a caravan with a timber annex under a series of four temporary planning permissions, the last of which expires at the end of April 2002. They have also received temporary planning permission for a stable block and a horse training enclosure. In 2000 outline permission was applied for a low impact dwelling of a 60m² footprint next to the barn. Planning permission was refused by Snowdonia National Park, an appeal took place and this was dismissed on 16 Jan 2002.

7.21 Across the site a sophisticated Permaculture design has been developed including pasture, regenerating woodland, wetlands, raised beds, a polytunnel and the stables and pen for training horses. The development and results of the Permaculture work on the site have been the subject of a number of publications and the occupants are acknowledged as leading Permaculture practitioners in Wales. A limited amount of produce is sold from the site and Permaculture and horse training courses are held on the site throughout the year.

7.22 The occupants wish to continue to live on the site and develop their Permaculture work and their businesses selling produce from the site and training horses.

Tir Sisial, Ceredigion

7.23 Tir Sisial is a 42 acre (17 ha) site just outside Llanrhystud on the Ceredigion coast of mid-Wales. The site straddles two sides of a steep-sided wooded river valley with pasture along the valley floor. The woodland, although of ancient origin, has been largely replanted with conifers by the Forestry Commission before passing into private ownership. A small clearing has been made approximately half way up the northern slope of the valley on one of the main forestry extraction tracks.

7.24 The site was bought by its present occupiers in 1997 who established a business, Ashling, on the site. This involves woodland management, the manufacture of woodland products (using raw materials from the site) and a herb nursery.

7.25 The main residents of the site are the family running the Ashling business, comprising two adults and four children, although two have now left home. In addition, up to two additional adults have stayed at the site as seasonal labour and as participants on residential training schemes. Between 1998 and 2002 eight people have been trained here in forestry and horticulture under the New Deal Environmental Task Force initiative.

7.26 In 1993, when the site was part of a 76.5 acre holding, an application for a temporary mobile home for a horticultural worker was approved. In 1998 the current owners applied for a forestry worker's dwelling on the valley floor. This was refused, and it was noticed that a timber cabin and two mobile homes had been located in the clearing on the valley side. The cabin was seen as a lawful development, as it had been there for over four years, though residential use is not permitted. Temporary permission was granted for the two mobile homes, expiring in June 2001. Forest tracks have been permitted and implemented to allow better management of the woodland. At the time of writing further applications for the use of the cabin for residential purposes and the retention of the mobile homes are awaiting decisions.

7.27 Ultimately the owners of the site wish to move to a low impact dwelling on the valley floor, removing the cabin and caravans from the higher clearing, and to

continue to develop their horticultural and woodland businesses and management of the site.

Sustainability appraisal of case studies

Previous sustainability appraisal approaches

7.28 Both Fairlie (1996) and Barton and Kleiner (2000) have undertaken sustainability appraisals of LIDs. Fairlie examined four cases from the UK in detail and compared them to a conventional house. He used eight criteria for LID:

- *small-scale*
- *unobtrusive*
- *local materials*
- *wildlife and biodiversity*
- *low levels of resource use*
- *transport*
- *sustainable livelihood*
- *positive environmental impact*

7.29 Each development was scored on each criteria on a four-point scale, with the separate scores added together to derive a total impact score.

7.30 Barton and Kleiner utilised different criteria to examine 55 projects, 28 of which were 'rural eco-villages' from around the world. Their 12 criteria were:

- *heterogeneous social composition*
- *land use diversity (local work and facilities)*
- *'green' economic activity*
- *distinctive, pedestrian-scaled public realm*
- *effective pedestrian / bicycle / public transport networks linking to the wider area*
- *private motor use discouraged*
- *ecologically responsible energy strategy*
- *ecologically responsible water strategy*
- *recycling of land and / or buildings*
- *ecological landscape / local food*
- *community / user involvement*
- *sustainable management*

Their scoring system was simpler, using either a tick, cross or a dash where impacts were unknown.

Sustainability appraisal used in this study

7.31 This study has used a more sophisticated approach, building on these earlier appraisals but also adopting the model for appraisal suggested in the emerging *Sustainability Appraisal of UDPs - a Good Practice Guide* (the Assembly Government), taking headlines, objectives and sustainability criteria as the structure for the appraisal.

7.32 The starting point is the Assembly's *Learning to Live Differently - The Sustainable Development Scheme of the National Assembly for Wales* (November 2000) which sets four core objectives for sustainable development:

- *social progress which recognises the needs of everyone*
- *effective protection of the environment*
- *prudent use of natural resources*
- *maintenance of high and stable levels of economic growth and employment.*

7.33 These are the headlines for the appraisal. They are developed in *Planning Policy Wales* (2002) which provides interpretation for land use planning policy. Paragraph 2.3.2 provides an extensive list of objectives that should be taken into account in the preparation of development plans and the control of development throughout Wales, to:

- *Promote resource-efficient settlement patterns that minimise land-take (and especially extensions to the area of impermeable surfaces) and urban sprawl, especially through preference for the re-use of suitable previously developed land and buildings, wherever possible avoiding development on greenfield sites*
- *Locate developments so as to minimise the demand for travel, especially by private car*
- *Contribute to climate protection by encouraging land uses that result in reduced emissions of greenhouse gases, in particular energy-efficient development, and promoting the use of energy from renewable sources*
- *Minimise the risks posed by, or to, development on, or adjacent to, unstable or contaminated land and land liable to flooding. This includes managing and seeking to mitigate the effects of climate change*
- *Play an appropriate role in securing the provision of infrastructure (including water supplies, sewerage and associated waste water treatment facilities, waste management facilities, energy supplies and distribution networks) - the basis for sustainable communities - and telecommunications infrastructure, while ensuring proper assessment of their sustainability impacts*
- *Contribute to the protection and improvement of the environment, so as to improve the quality of life, and protect local and global ecosystems. In particular, planning should seek to ensure that development does not produce irreversible harmful effects on the natural environment. The conservation and enhancement of statutorily designated areas and of the countryside and undeveloped coast; the conservation of biodiversity, habitats, and landscapes; the conservation of the best and most versatile agricultural land; and enhancement of the urban environment all need to be promoted*
- *Help to ensure the conservation of the historic environment and cultural heritage, acknowledging and fostering local diversity*
- *Minimise the use of non-renewable resources, and, where it is judged necessary to use them, maximise efficiencies in their use. The use of renewable resources and of sustainably-produced materials from local sources should be encouraged*
- *Encourage opportunities to reduce waste and all forms of pollution and promote good environmental management and best environmental practice*

- *Ensure that all local communities - both urban and rural - have sufficient good quality housing for their needs, including affordable housing for local needs and for special needs where appropriate, in safe neighbourhoods*
- *Promote access to employment, shopping, education, health, community, leisure and sports facilities and open and green space, maximising opportunities for community development and social welfare*
- *Foster improvements to transport facilities and services which maintain or improve accessibility to services and facilities, secure employment, economic and environmental objectives, and improve safety and amenity. In general, developments likely to support the achievement of an integrated transport system should be encouraged*
- *Foster social inclusion by ensuring that full advantage is taken of the opportunities to secure a more accessible environment for everyone which the development of land and buildings provides. This includes helping to ensure that development is accessible by means other than the private car*
- *Promote quality, lasting, environmentally-sound and flexible employment opportunities*
- *Support initiative and innovation and avoid placing unnecessary burdens on enterprises (especially small and medium sized firms) so as to enhance the economic success of both urban and rural areas, helping businesses to maximise their competitiveness*
- *Respect and encourage diversity in the local economy*
- *Promote a greener economy and social enterprises*
- *Contribute to the protection and, where possible, the improvement of people's health and well-being as a core component of sustainable development. Consideration of the possible impacts of developments - positive and/or negative - on people's health at an early stage will help to clarify the relevance of health and the extent to which it needs to be taken into account*

These set considerable scope for the consideration of sustainability in Welsh planning and in doing so capture many elements relevant to LID.

7.34 These objectives from *Planning Policy Wales* have been combined with the objectives for the sustainability appraisal of UDPs in *Sustainability Appraisal of UDPs - a Good Practice Guide* and some elements from earlier appraisals to provide a systematic sustainability appraisal for LIDs. The matrix for the appraisal follows overleaf as **Table 7.1**.

Table 7.1 : Matrix for Sustainability Appraisal

Sustainability objective	Criteria	Commentary	Criteria score	National / regional / local impact	Reversible / irreversible
Social progress which recognises the needs of everyone					
Housing	<ul style="list-style-type: none"> provision of affordable housing meeting local needs provision of good quality housing 				
Access and community	<ul style="list-style-type: none"> linkages to local services and facilities relationships with local communities community cohesion 				
Culture	<ul style="list-style-type: none"> origins of residents protection and enhancement of Welsh language and cultural heritage and diversity 				
Health and well-being	<ul style="list-style-type: none"> safe living and working environments healthy living and working environments 				
Effective protection of the environment					
Biodiversity	<ul style="list-style-type: none"> conservation, enhancement and restoration of existing habitats, diversity and abundance of indigenous species 				
Landscape	<ul style="list-style-type: none"> conservation and enhancement of distinctive natural and historic landscapes landscape intrusion 				
Built environment	<ul style="list-style-type: none"> conservation and enhancement of existing built environment form and design new development of a high standard innovative design solutions 				

Prudent use of natural resources					
<i>Generally</i>	<ul style="list-style-type: none"> • pursuit of natural resource use efficiencies • recycling / waste minimisation / waste management • prevention or management of pollution and promotion of good environmental practice • utilisation of food and other resources from site 				
<i>Energy</i>	<ul style="list-style-type: none"> • use of renewable energy sources / reduction of consumption of non-renewable energy • high levels of energy efficiency • low levels of embodied energy 				
<i>Land</i>	<ul style="list-style-type: none"> • re-use of previously developed land / buildings 				
<i>Water</i>	<ul style="list-style-type: none"> • water sources • waste water management 				
<i>Air and atmosphere</i>	<ul style="list-style-type: none"> • reduction of air pollution 				
<i>Minerals / building materials</i>	<ul style="list-style-type: none"> • use of renewable / recycled resources / minimisation of use of non-renewable resources • use of traditional materials 				
<i>Transport</i>	<ul style="list-style-type: none"> • minimisation of the need to travel • use of modes other than the private car • efficient use of transport • support for an integrated transport system 				

Maintenance of high and stable levels of economic growth					
Economic diversification	<ul style="list-style-type: none"> diversification or enhancement of the rural economy re-integration of agriculture back into a more diversified rural economy 				
<i>Local businesses</i>	<ul style="list-style-type: none"> quality, durable, environmentally suitable and flexible employment opportunities production of goods and services for sale utilisation / enhancement / diversification of traditional rural skills 				
<i>Access</i>	<ul style="list-style-type: none"> on-site employment local off-site employment unemployment amongst residents 				
<i>Encouraging investment</i>	<ul style="list-style-type: none"> wealth creation and attraction of investment use of indigenous resources 				
Factors particular to LID					
	<ul style="list-style-type: none"> self sufficient livelihoods integrated site management necessity of residence 				

7.35 This sustainability appraisal matrix has then been applied to the case studies to provide a general understanding of the sustainability issues relating to Low Impact Development. However, it is not the role of this study to stand in judgement over individual LID cases. Rather, its purpose is to examine LID in Wales as a whole and whether planning procedures or policies need to be changed. If the study was reduced to a debate over the five case studies this important purpose would be lost.

7.36 For each of the aspects of the sustainability matrix, therefore, one of the case studies has been taken and that section of the sustainability appraisal completed. The performance of the other case studies is considered more briefly. In this way a picture of the sustainability performance of elements of the individual case studies is developed, and thus a picture of the potential sustainability performance of LID as a whole. This allows the wider issue of the sustainability credentials of LID to be considered while avoiding a full sustainability appraisal of individual cases which could be seen as tantamount to advising on the suitability of individual LIDs.

Scoring

7.37 Scoring of the sustainability impact of LID against each sustainability criteria in the matrix, has been considered under these headings:

i) *Sustainability impact*: This notes whether the sustainability impact of the development is positive or negative, as follows:

++	strong positive impact
+	positive impact
~	neutral impact
-	negative impact
--	strong negative impact
?	not known
n/a	not applicable

To avoid confusion all beneficial impacts are recorded as positive, including factors such as landscape impact (so ++ notes a strong positive landscape impact).

ii) *Scale*: In other words, is the impact (positive or negative) of local, regional, national or international significance.

iii) *Reversibility*: Is the impact reversible or irreversible (borrowing an important consideration from Environmental Impact Assessment). Reversibility means that should the development cease, the site can easily revert to its former environmental condition (or better). This is a central concern of LID. As such, environmental management should be sensitive to local ecology, and buildings and structures designed to be readily dismantled and moved, with a light footprint on their locality. Reversibility is a different concept to temporary. This distinction is discussed in Chapter 10.

7.38 Thus the potential sustainability scores are as follows:

++n	strong positive impacts (national, regional, local)	++i	strong positive impacts (reversible, irreversible)
++r		++r	
++l			
+n	positive impacts (national, regional, local)	+i	positive impacts (reversible, irreversible)
+r		+r	
+l			
~	neutral impacts	~	neutral impacts
-n	negative impacts (national, regional, local)	-i	negative impacts (reversible, irreversible)
-r		-r	
-l			
--n	strong negative impacts (national, regional, local)	--i	strong negative impacts (reversible, irreversible)
--r		--r	
--l			
?	not known	?	not known
n/a	not applicable	n/a	not applicable

7.39 The use of such a matrix cannot provide quantitative statements of the sustainability of developments, as the scoring and interpretation is, to an extent, a matter of judgement rather than measurement, requiring a clear justification of the scores in the reasoned commentary.

7.40 For each of the case studies a specialist team visited the site to assess all elements of the appraisal. The appraisals were completed with contributions from all members of the team and looking across all five cases to ensure parity of judgement.

Sustainability appraisal results

7.41 The full details of the sustainability appraisal can be found in **Appendix 6**. What follows is a summary of the results, organised by the appraisal headlines.

Social progress which recognises the needs of everyone

7.42 **Low cost housing** : LID has clear potential to provide exceptionally **low cost housing**. In none of the case studies had this potential been fully realised as the intended dwellings have not been built, are not lived in, or are unauthorised. The roundhouse at Brithdir Mawr illustrates these low costs, costing around £3,000 to build: affordable to its residents despite their exceptionally low income. In all cases it was also emphasised that cutting the costs of accommodation was crucial to allow other elements of the LID to happen, such as environmental management, and utilising food, fuel and other resources from the site, as these activities offer little economic reward. The **quality** of the **housing** also cannot be fully assessed as the cases are not 'finished'. Again the roundhouse, though offering simple accommodation, satisfies the aspirations of its residents, and all those involved in

the case studies stressed that they sought only simple accommodation, in keeping with the wider aspirations of LID.

7.43 Linkages with local services and facilities: The residents of LID tend, by design, to live very local lives, and thus tend to form strong **linkages with local services and facilities** such as shops, pubs, schools and other public services, both as customers and suppliers of goods and services. The five cases all reported good **relationships** and involvement **with their local communities** (though the Rural Community Council for Brithdir Mawr disapprove of the fact that the roundhouse was built without planning permission). The residents of Brithdir Mawr, in particular, have a considerable range of involvement in local bodies and activities, including welcoming the community to their site. Given the size of the community this may not be surprising, but Tir Penrhos Isaf has only three residents but also shows a high level of engagement.

7.44 The contribution of the case studies to Welsh **culture** varies. Around half of the adult residents are of Welsh origin, a third speak Welsh fluently, a third speak some Welsh and a third do not speak the language but some are learning. The proportion of Welsh speakers comfortably exceeds the national average, though local levels of Welsh speakers vary considerably. Participation in local community, cultural and arts activities was quite common. Several residents also stressed their contribution to the maintenance of traditional skills and practices such as working with heavy horses and woodland management.

7.45 Health and well-being: These aspects of LID are not easily quantified. Although offering a somewhat rudimentary livelihood and a modest standard of living residents stressed the good quality of life offered by LID to them, principally linked with outdoor physical work and healthy eating. However, it is less clear how LID residents will cope in their very old age.

Effective protection of the environment

7.46 Habitat management and biodiversity enhancement: The case study LIDs all perform well for habitat management and biodiversity enhancement. Tir Penrhos Isaf, which has been managed and regenerated under a Permaculture design for 15 years, shows an exceptional diversity of habitats and species for a site of its size, with great benefits to local ecology. Significant environmental management is also found in two other cases, and some beneficial management on the remaining two. This is not surprising as environmental management and enhancement is a key characteristic of LID, and is seen as central in the definition of LID used in this study.

7.47 The **landscape** impact of LID varies but is often low as it is a central concern of LID to be unobtrusive, both in terms of buildings and structures and in terms of creating a range of semi-natural habitats on site. Nevertheless, his assessment was hampered as in most cases the desired final building had not been constructed.

7.48 Innovative design: LID buildings can be of **innovative design**, rather than reflecting local vernacular styles (though roundhouses have obvious historic references). Such designs can polarise opinion as to their local 'fit' although they are usually of a rural form and very modest scale. Similarly the **standard** or **quality** of such development is open to conjecture.

Prudent use of natural resources

7.49 Pursuit of natural resource efficiencies: This is also intrinsic to LID and a key influence on many aspects of the case studies. **Recycling, waste minimisation and management** are common, assisted considerably by high awareness by the residents and use of appropriate technology. In the majority of cases, many of the residents' needs were met from the sites' resources. Similarly, systems of land management and other features of the case study sites were intended to minimise **pollution**. In addition, all cases **promoted good environmental practice** in a variety of ways such as visits and training courses on the sites.

7.50 Utilisation of food and other resources from site: This is an integral feature of LID, and the more fully-developed cases showed a significant degree of self-sufficiency, particularly in food and fuel.

7.51 Use of renewable energy: This was common amongst the case studies, though to varying degrees according to the extent to which the LID had been realised. It was a clear aspiration of most of the case studies to meet all energy needs from renewable sources, chiefly wood (for heating and cooking) and various sources of renewable electricity. At Brithdir Mawr all energy is derived from these sources. LID buildings also aspire to high levels of **energy efficiency** and low **embodied energy**, though there are few 'finished' examples other than the roundhouse at Brithdir Mawr. In addition, LID lifestyles tend to be significantly less energy demanding than typical modern rural lifestyles.

7.52 Water supply: Only one of the cases used mains water, the rest using springs and wells. **Waste water** is usually treated through reed bed systems and compost toilets minimised the production of sewage.

7.53 Atmospheric pollution: From all sites this was relatively low, principally due to low levels of energy and transport use. Wood was the main fuel for heating and cooking though, which is relatively polluting, but this is unlikely to be significant in a rural location.

7.54 The reuse of buildings and land: This was variable across the case studies as, being in a rural location, previously-developed sites were not common. The use of **renewable and recycled materials** for building construction, however, was very common although these materials were not necessarily **traditional**.

7.55 Low energy consumption associated with transport: The cases studies showed that LID has the potential to **minimise the need to travel**, use modes of transport other than the private car, and make **more efficient use of transport** when used. Brithdir Mawr was able to provide considerable detail on their transport use over the last year. On average the residents made under two thirds the number of trips of a UK resident and travelled only a quarter of the average total distance. Their level of car ownership was significantly reduced through a car share arrangement and they were significantly less reliant on car use than an average UK resident, using other modes of transport (despite their relatively isolation). Though not quantified, the other case study sites reported similar patterns of transport use with the residents: making fewer trips from the site, travelling less distance, and having lower levels of car use, greater car sharing and more use of other modes of transport (cycling and horse power) than an average UK resident. The rural location of the cases, however, limits their ability to support an **integrated transport system**, though they also have less need for transport.

Maintenance of high and stable levels of economic growth

7.56 Economic development is not the principal objective of LID. Nonetheless all of the case studies make varying, albeit modest, contributions to the local economy. Tir Sisial was able to provide considerable details on the business. This herb and woodland management business provides **employment opportunities** and income for the site's residents and supports a variety of employees and trainees, while producing **products** for other local businesses to sell. It is a clear example of **diversification of the rural economy** and of **re-integration of agriculture back into the wider rural economy**. The business also utilises and diversifies **traditional rural skills**.

7.57 At both Brithdir Mawr and Tir Penrhos Isaf residents combine **on-site** and local **off-site employment**. But the focus of their work is on the site as their financial requirements are small, with the majority of their needs being met from the site. Modest produce surpluses are sold into the local economy.

7.58 In absolute terms the **wealth creation** generated by LID is low, with average personal weekly incomes in the range £35-45, but the **use of indigenous resources** is high. LID businesses do not generate high incomes, but these are not needed to support LID livelihoods. Local economic involvement through exchange, barter and schemes such as LETs is relatively common. Importantly, **unemployment** levels are low, as is utilisation of benefits, despite entitlement, as residents see this as contrary to the ethos of a LID livelihood.

Factors particular to LID

7.59 The sustainability appraisal also identified three factors particular to LID:

- self-sufficient livelihoods
- integrated site management
- necessity of residence on-site.

As these are all directly concerned with the fundamental nature of LID they are covered in chapter 9.

Control case

7.60 A control case was also assessed, though not in the same detail as the five LID cases. Its purpose was to provide a simple comparison with another mixed use in the open countryside. This control site was a Welsh family livestock farm that had diversified by opening a farm shop. The key characteristics of this control site were:

- strong linkages to the local community as the farm shop is now the only local shop
- limited environmental contribution with low levels of biodiversity and lack of management of semi-natural resources
- natural resource use typical of a contemporary family home, reliant on non renewable resources and high use of family cars as the site is relatively isolated from other services.

7.61 Very noticeable in the comparison between the control case and the LID case is the overall focus of the activities on the site. For the LID cases the focus is very much on the integration of activities and management of the site as a whole. For the control case there are essentially two foci: the farm business and farm

shop, and the family residence, with little attention to the integrated use of the whole site.

8. THE CASE STUDIES AND THE PLANNING SYSTEM

8.1 All of the case studies have had some degree of involvement with the planning system. For the Roundhouse Project and Coed Hills this has been relatively straightforward. A decision on the latest application for Tir Sisial is awaited. Both Brithdir Mawr and Tir Penrhos Isaf have experienced effective refusals of the LID at appeal.

8.2 The experience of these LID projects of the planning system is important as it provides a clear indication of how the planning system in Wales currently conceives and judges LID.

The Roundhouse Project and Coed Hills

8.3 The Roundhouse Project has been granted temporary planning permission on the clear understanding that the roundhouse is used for limited research and education and not for residential purposes. It is expected that the building will be removed at the end of the year and it has not been associated with management of the surrounding land. Similarly, the development permitted at Coed Hills is restricted to use as artists studios, workshops and other similar activities and does not include any residential elements. Thus in neither case has the planning authority been presented with a fully developed LID, either because, as in the case of the Roundhouse Project, it was made clear that residential use was not acceptable, or because, as for Coed Hills, the residential elements of the LID was already covered by a Certificate of Lawful Use.

8.4 The planning authority for both cases is the Vale of Glamorgan County Council. Development control officers from the Council were interviewed about these two cases. Their comments were that although they could see the sustainability merits of such cases (or their potential benefits were they to be more fully developed as LIDs) their principal and overriding concern was that, in an area of great pressure for new housing in the open countryside, LIDs might just be devices to obtain a new housing plot. They felt ill-equipped to distinguish genuine LIDs committed to environmental enhancement and minimal resource use from other forms of more conventional residential development. Thus they were intrinsically suspicious of LID and unlikely to approve it should it involve residential use.

Tir Sisial

8.5 Tir Sisial is essentially in a period of planning limbo as the structures already on the site have been allowed to remain for a two-year period so that the owners' business might prove itself as viable and justify a permanent dwelling. As previously noted, planning applications for the retention of the structures for a further temporary period are currently being considered. The Local Planning Authority's standard questionnaire for agricultural and forestry workers' dwellings has been sent to the owners for completion.

8.6 Again, the development control officers (Ceredigion County Council) were interviewed. Although they understood the relatively unusual nature of the development and its sustainability objectives, they noted that all the attributes of LID could not easily be taken into account under current planning policies. It was felt that a functional or financial case for a forestry / agricultural workers'

dwelling might be hard to substantiate for the current business. Also, the issues of how to manage the development to ensure both the fulfilment of its sustainability credentials, and to prevent it lapsing into just another house in the open countryside, were key concerns beyond the current reach of the planning system. Thus, while able to appreciate the features of the LID, the officers felt unable to take them fully into account in making decisions or in managing any development that might be permitted. Recommendations have yet to be made for the current planning applications.

8.7 The officer was keen to stress that current national planning guidance does not embody a full appreciation of sustainability issues in rural Wales, including Low Impact Development.

Brithdir Mawr

8.8 The two cases which have been the subject of planning appeals, Brithdir Mawr and Tir Penrhos Isaf, are of considerable importance to this study as they have essentially tested planning policies and decision-making in Wales to its effective limits with regard to Low Impact Development. They are considered in turn. In each case the inspector's reasoning is the main consideration, though points from the evidence presented to the Inspector are also examined.

8.9 In November 2000 a public inquiry was held into the appeal against the enforcement notice of the Pembrokeshire Coast National Park Authority requiring the demolition and removal of the roundhouse at Brithdir Mawr. The Inquiry sat for three days. The appeal was allowed, the enforcement notice removed and temporary and personal permission granted for the roundhouse for a further 18 months, so that its occupants could find alternative accommodation, at which time it would be demolished.

8.10 The Inspector's Appeal Decision opens with a detailed description of Brithdir Mawr, including the buildings and structures, the roundhouse, the spring water source, the treatment of grey water using reed bed systems, and the generation of electricity on the site providing all the energy needs of the community.

The main issues in the case are set out as:

- *"the effect of the retention of the appeal dwelling (the roundhouse) on the natural beauty of its national park surroundings;*
- *whether there is sufficient agricultural, forestry or other justification for the retention of the dwelling to outweigh any harm on the first issue."*

Relevant elements of the development plan, Planning Policy Wales (1999) and TAN 6 (2000) addressing these two issues are also set out. These cover agricultural and forestry workers' dwellings, other residential development in the countryside, protection of the character and appearance of the National Park, sustainable development, biodiversity and social considerations.

The cases of the two principal parties is then outlined.

8.11 *The case of the appellant:* The appellant suggested that the roundhouse is in keeping with its surroundings, of minimal visual impact, and is of an innovative and sustainable design, incorporating sustainable: energy use and efficiency, water supply and waste management, and construction from natural materials.

8.12 It was also suggested that there was a functional need for the dwelling due to the mainly manual and horse-based methods of agriculture and forestry used on

the holding. Thus labour requirements are considerably higher than those on a farm where fossil fuel powered machinery is used. Should a financial test be applied it was explained that the costs of living as part of the community were very low and that although the earnings of the appellant and his partner were low they were sufficient to support a viable livelihood. It was also noted that there were no other dwellings on the holding which the appellants could occupy or convert for occupation without being expensive or using buildings intended to be used to house horses. If they had to live in a neighbouring settlement the costs and environmental impacts of commuting by car would be considerable, as would be the reduction in their time available for work on the holding should they travel by bicycle. They would also not be able to play a full part in the community.

8.13 The appellant suggested that if there was insufficient agricultural or forestry justification their woodworking and music activities helped diversify the rural economy. And went on to note that the granting of planning permission would not set a precedent for the development of other types of housing because of the special circumstances of the development, including the links with its Permaculture on the holding, its educational and research value, and the broad local support. He also noted that should the appellant and his partner have to leave the roundhouse and take up other conventional housing in the locality, they would have to seek state support; something they currently do not need or wish to do.

8.14 *The case of the planning authority:* The National Park Authority's case was based on the policies of the development plan. These state that new housing in the countryside should only be permitted where there is a strong agricultural or forestry justification. The planning authority suggested that the range of activities that Permaculture might include is not clearly defined, nor is the relationship between them. They suggested that only sufficient employment for a full-time worker additional to those already living on the holding would justify a new dwelling. On this basis, and taking into account the more labour-intensive nature of work on the holding, they concluded that there was no need for either the appellant or his partner to live on the holding in the interests of its proper functioning. This was justified both in terms of the low number of animals on the holding and the total hours of work needed per year. Also, on the basis of the minimum agricultural wage, the holding would only support three full-time workers. Accordingly they concluded that neither the functional or financial tests for an agricultural workers' dwelling were satisfied (TAN 6, paras 41-46)

8.15 In addition, they argued that any educational or research value of the building was negated by its unauthorised erection recognising that development without planning permission sets a poor example. To allow the building to stay would encourage others to erect similar buildings without planning permission. They concluded that the roundhouse was harmful to the natural beauty of the National Park.

8.16 The Inspector's reasons and conclusions were based on the two principal issues identified above. Considering the effect of the roundhouse on the National Park he commented:

"... most dwellings in the locality, and especially those of traditional design are 2- or 3-storey in height, and have slate roofs, stone or rendered walls, and small windows. Consequently, because the appeal dwelling is only one storey and has a particularly squat shape overall, has a turfed roof and cob walls, and a wide expanse of glass at the front, it is seriously out of keeping with the general character of dwellings in this part of the National Park. At the same time, its siting away from other buildings results in unattractive, sporadic development

which is not outweighed by the advantage of its southerly aspect. In addition, its mushroom-like overall design, the prominence of the details of its metal flue and solar panels, and the mixture of too many, un-coordinated, recycled materials at the front, give it an unsightly and incongruous appearance”.

8.17 He goes on to conclude:

“Because of its location in the National Park, where the protection of the landscape and scenic beauty are especially important, this visually poor quality building neither harmonises with nor enhances, its surroundings. Indeed, it causes them demonstrable harm. Whilst the dwelling may be architecturally interesting, and even significant to some specialists, nevertheless, it has little, if any connection with the traditional types of buildings found in the area and, because of its poor design and siting, it is aesthetically most unsatisfactory.”

8.18 He advised that the roundhouse was harmful to the natural beauty of the National Park and that its retention was unacceptable unless there was sufficient justification on agricultural, forestry or other planning grounds.

8.19 Turning to the second issue the Inspector dismissed any agricultural or forestry justification:

“Turning to the second main issue, the farm and forestry unit at Brithdir Mawr has few animals and hardly any crops, if any at all, which require someone to be on the spot 24 hours a day, all year round in the interests of animal welfare, protection of saplings or other emergency. There is thus no clearly established functional need for anyone else other than those who lawfully live on the holding to do so. The appeal dwelling thus clearly fails the first fundamental test for an agricultural or forestry dwelling. There is, therefore, no need to consider the other tests, including the financial test”.

8.20 He did, though, go on to consider the financial test in terms of the Petter and Harris case (outlined below), commenting:

“It seems to me that since the financial test is not relevant where the functional need for a dwelling has not been proven this judgement is not relevant to this appeal. In any case, if the appeal dwelling did not exist, the low-level viability of Brithdir Mawr would be unlikely to be imperilled”.

8.21 He also commented that none of the other activities of the appellant and his partner, such as woodworking or music making, required them to live on the spot, and thus did not justify the dwelling either.

8.22 The Inspector then turned to the issue of sustainable development:

“With regard to the claimed sustainable nature of the appeal dwelling, bearing in mind that all new development should be sustainable, this is not of substantial weight. At the same time, whilst Brithdir Mawr as a whole claims to be a model of sustainability in operation, the contribution which the appeal dwelling makes to this is so small as to be minimal”.

8.23 The Inspector also took into account the personal circumstances of the applicant:

“From the evidence, they are financially poor and do not wish to seek state benefits, even though they might be eligible for them. Without such benefits they are likely to find it difficult to obtain alternative housing within daily travel distance of Brithdir Mawr, at least by cycle, in such a timescale. It would not be in the public interest. if they were also to lose their livelihood”.

8.24 He concluded that either converting the stable block or the hostel at Brithdir Mawr, or finding other affordable accommodation in the locality would be possible within 18 months and effectively granted a temporary and personal consent for 18 months on this basis, after which time the roundhouse would be demolished and removed.

8.25 The Inspector took time to consider the comments of the Principal Surveyor, from the County Council who was asked to assess the agricultural viability of the application, as a reason for retaining the roundhouse as is standard practice for all applications for agricultural or forestry workers' dwellings. In his first response, dated 8 June 2000, the Principal Surveyor noted:

"I have given very careful consideration to this application. You will, of course, be aware that I normally assess the agricultural viability of an application upon the basis of a financial test i.e. whether the operation can generate a living wage, and a functionality test i.e. whether the applicants need to be on site for the purposes of the agricultural operation...."

It is quite obvious from the outset that the Brithdir Mawr situation does not fall within the assumptions as it was never set up to be a commercial farming operation...."

8.26 He then cited the case of *Petter & Harris vs the Secretary of State for the Environment, Transport and the Regions & Chichester District Council* where it was found that there was no need to prove financial viability if the activity could be shown to be sustainable (the applicants were aiming to be self-sufficient rather than to farm commercially). He concluded that there were similar circumstances in this case and that the financial test might therefore not be appropriate.

8.27 He then considered the functional test:

"The functional test then brings us to the thorny question of, do the applicant and his partner have to live on site i.e. whether for the proper functioning of the enterprise, one or more workers need to be readily available at most times in terms of both its current and likely future requirements. If you look at the diverse range of work undertaken at Brithdir Mawr by the applicant and his partner, then it is fairly clear that in terms of the functional requirements of the community, that the answer would be yes. They play a major role in ensuring its sustainability, and carry out tasks which could, by the very nature of their diversity, collectively require constant presence on the land, not because of one overriding need, but because of the number of essential daily tasks and unforeseeable minor emergencies, coupled with input into group projects, which would make their alternative of living off site in, say Newport, totally impractical. Accordingly, on the test of functionality of Brithdir Mawr community and given the concepts and practices of that community, it could well be interpreted by the Courts that their presence on site is essential".

8.28 He went on to note that the roundhouse, by the nature of its construction, could only be considered a temporary structure.

He concluded:

"In summary, this application simply does not fit into the traditional interpretation of the guidelines for agricultural dwellings. A strict interpretation of the guidelines does not allow one to consider the particular unique circumstances of the applicant's situation nor address issues which should properly be taken into account in order to reach a sound judgement based on the facts and circumstances relating to this case.

My conclusion is that it would be far better to explore with the applicants the alternative of a temporary consent, which could be renewed, provided circumstances remain the same after say a period of 3 years, and which is personal to the applicant and his partner, and conditional upon them continuing to maintain the input into the activities they undertake at Brithdir Mawr”.

8.29 Following discussion with the officer handling the case he added the following comments on 18 July 2000:

“I refer to your letter of the 5 July and our subsequent telephone conversation. As I explained, the circumstances of this application cause a major problem when trying to fit it within the framework of trying to establish agricultural justification for the proposal. My advice therefore was basically aimed at looking to see if there was perhaps another way within your planning policy of approaching something that perhaps could have been more fairly described as an experiment in ‘alternative living’ encompassing some agriculture and horticulture but with an emphasis on sustainability and self-sufficiency rather than running a commercial operation.

This coupled with the element of community living and mutual support takes the proposal so far outside normal guidelines and criteria for agricultural assessments that I am unable to advise you on that basis”.

8.30 Commenting on this discourse the Inspector concluded:

“With regard to the observations of the County Council Head of Property and Projects on the Appellant’s retrospective planning application, to the extent that these are relevant to this appeal, they are not helpful one way or the other. This is because, having concluded that he could not assess the proposal according to the normal criteria, he then makes a recommendation. This was outside his remit”.

8.31 The Inspector also commented on other developments allowed by the National Park Authority which included a turf-roofed museum and an earth-sheltered replacement dwelling on the coast. He concluded that both were also harmful to the National Park and that neither lent any support to the retention of the roundhouse.

8.32 The Inspector did, though, grant temporary consent for the roundhouse for 18 months so that the appellants would have time to find alternative accommodation, making the following observation:

“The NPA may consider that my decision will make it more difficult for them to resist equivalent temporary and personal permissions in similar circumstances. However, there is no specific evidence before me that the particular combination in this appeal of policy, physical and personal circumstances is likely to be replicated elsewhere in their area. Accordingly, this decision is unlikely to increase materially the difficulty of achieving the purposes of designation of the National Park, or any part of it”.

8.33 Addressing the issue of human rights the Inspector noted that the appellant’s rights, and those of his partner, would be interfered with, but that this was balanced by the public interest in protecting the environment and economic well-being of the area, and was thus not disproportionate.

8.34 In summary, the Inspector concluded that there was insufficient agricultural, forestry or other planning justification for the retention of the roundhouse to outweigh the harm to the natural beauty of the National Park and only allowed

temporary consent for the roundhouse in order to allow the appellant to find alternative accommodation within 18 months.

Tir Penrhos Isaf

8.35 The appeal concerning Tir Penrhos Isaf was determined by written representations.

In describing the proposed dwelling the Inspector noted that:

"It is designed to have a low environmental impact in terms of its appearance, materials, construction method, maintenance and subsequent removal if it is no longer required to serve the holding".

8.36 He outlined the main issues in the case as:

"... whether or not there is a over-riding functional need for a new dwelling here and, if there is, whether or not the agricultural holding concerned is financially viable and likely to remain so in the future".

8.37 He summarised the case:

"The Appellant claims that the proposed dwelling is necessary in functional terms to meet the needs of a number of interconnected businesses which are mutually supportive and relate to agriculture, forestry or farm diversification. In particular, the poly-tunnel and green-house require regular (minimum twice daily) checks to ventilation and watering systems and additional frost protection during the six winter months. Client's horses brought to the site for training are permanently stabled and have individual values of up to £5000. 24 hour supervision is required for security and insurance reasons. Regular half-day demonstrations of the training techniques are held, draw audiences of up to 50 people and require two further days of on- site preparation".

8.38 His decision was then explained as follows:

"I do not consider that daily supervision of the poly-tunnel/glass house needs a full-time worker to live on the spot. The fairly low-key agricultural operations which I saw on my visit took the form of a small-scale market garden which could reasonably be managed by someone travelling daily to work. Paragraph 59 of TAN 6 points out that the use of land for keeping horses for equestrian activities lies outside the definition of 'agriculture' in Section 336 of the Town and Country Planning Act 1990 and paragraph 44 warns that although the protection of livestock from theft or injury by intruders may contribute on animal welfare grounds to the need for an agricultural dwelling, it will not by itself be sufficient to justify one".

8.39 He then considered the financial test:

"I have noted that the Council's Agricultural Liaison Officer advised the Planning Committee that the appeal unit was comparatively insignificant in agricultural terms and unlikely to prove the demand for a dwelling. Cash-flow figures for the year 2000 show that, without the income from horse-training and other outside work, the enterprise would have traded at a loss and, therefore, in economical terms, the only conclusion is that it was not a sustainable proposal".

8.40 And summarised:

"My overall conclusions, therefore, on the main issues is that any new dwelling here would undermine one of the statutory purposes of the National Park to conserve and enhance its natural beauty..."

8.41 The Inspector noted that there was varying advice concerning the proposal. The National Park's Agricultural Liaison Officer recommending refusal, while the Environmental Policy Officer and Ecologist supported approval. Much of the written evidence concerned whether proper weight had been given to these competing views.

8.42 The Agricultural Liaison Officer commented:

"I am unable to provide any technical advice on this application as the unit is comparatively insignificant in agricultural terms. In pure agricultural terms this size of unit is unlikely to prove the demand for a dwelling.

I have been following the development of Tir Penrhos Isaf since the late 1980s, (through the planning system), and would like to make the following observations:

- In my opinion the applicants have not intensively practised the principles of Permaculture in the last years, and have relied on more conventional forms of income generation.*
- What is practised today at Penrhos Isaf (horse training) has moved away from the ideas set out with the previous planning application.*
- The actual cash flow for the year 2000 show that if the horse training income (£4,547.00) and outside work (£ 10,160. 00) are taken out, the Tir Penrhos Isaf business would have made a loss of £5,841.00. Therefore in economical terms the only conclusion is that it is not a sustainable proposal".*

8.43 The Environmental Policy Coordinator offered contrasting views:

"A fundamental (and consistently stated) characteristic of the management of this site is that it would rely on poly income - that is, income from a variety of sources. It has also been envisaged that these sources themselves would vary over time. This has been the case. This seems to be a strength rather than a weakness and is a useful exploration of a model from which many other local landowners practising single income monocultural farming or forestry could benefit greatly".

He suggested that the development be allowed subject to personal and temporary (10 year) consents and a legal agreement covering management of the site.

8.44 The Park Ecologist was similarly enthusiastic:

"The first impression one receives on arriving at this secluded location is the extraordinary range and abundance of wildlife here. There are several well-established gardens, all designed and run according to Permaculture principles. Even in the depths of winter, there were several crops available for home consumption. There are also small woodland plantations, wetland sites and well-managed pastures as well as a small poly tunnel. The fertility of the holding has improved substantially since my last visit three years ago. I consider this holding to be a most important demonstration of Permaculture and sustainability. The owners have run well-attended and successful courses here on Permaculture. Indeed, they are leaders in the Permaculture movement nationally and now have a growing international reputation. We are most fortunate to have people of their reputation living in the National Park. It is clear that on this scale, Permaculture is an effective and exciting alternative to the more 'traditional' forms of land management in the Park. From an ecological perspective, the most rewarding aspect of this form of land management is the benefits to Biodiversity. It really was quite extraordinary to see so many birds, for example, congregating in such a small area in the depths of winter and I am quite sure that the abundance of wildlife on the site would be even more dramatic in summer. There is no doubt in my mind that this abundance is entirely due to the improvements in the many

habitats on the site brought about by sympathetic Permacultural management. I am sure you are aware by now of how important it is to the whole philosophy and execution of Permaculture that its exponents live on the site. As officers we can learn a lot from this experiment which is undoubtedly working. The improvements in Biodiversity alone since my last visit are astonishing. The benefits to other land owners and managers in the Park cannot be over-emphasised."

8.45 The Inspector offered this comment on these issues:

"In reaching my conclusions on the main issue, I have taken into account all of the other matters raised in the written representations, including the strong support for the appeal scheme from the Council's Environmental Policy Co-ordinator and Ecologist. I have some sympathy with their argument that, as this is a very small house, built of local materials, of a construction which would not impact on the landscape, directly related to a management of the land that demonstrates the principles of sustainable rural development and which has, by the management of the land and by a variety of means, created a modest income for a family over several years".

8.46 However, on the various means by which it was suggested he might allow permission for the development, taking these qualities into account, he commented:

"... do not, however, accept their conclusions that by treating the proposal as a 'one-off departure from policy and by imposing conditions or by seeking a unilateral undertaking by way of a Section 106 Agreement would overcome any adverse repercussions if the enterprise should fail.

A standard 'agricultural' occupancy condition would not be appropriate because the Appellant might not be able to demonstrate that he was 'solely or mainly working , or last working, in the locality in agriculture or in forestry'".

8.47 He also rejected a personal consent, restriction of permitted development rights and:

"An agreement to remove the dwelling if the holding ceased to be managed in accordance with a previously approved management plan would be both difficult and costly to enforce if the enterprise failed financially because the Appellant would be deprived of his only home without the necessary funds to move elsewhere".

8.48 And noted that:

"TAN 6 advises that it is not normally necessary to tie the dwelling concerned to the holding in question".

In particular he commented that:

"My experience is that any conditions restricting the right of an owner to dispose of his or her property on the open market are considered by most financial institutions to be an encumbrance which so reduces its value that they would be unwilling to make mortgage funds available.

The same problem would arise if the dwelling was subject to a temporary (10 year) permission.

Whilst the dwelling would have been built of locally-available materials and, possibly, with a labour contribution from within the Appellant's family, the Permaculture enterprise does not appear to be capable of funding the additional capital and/or running costs involved out of the surplus income".

8.49 Thus the appeal was dismissed.

8.50 The potential implications of these decisions for LID are considered in the next chapter.

9. DISCUSSION OF FINDINGS

9.1 The exploration of Permaculture and LID, planning policies touching on and dealing more directly with LID, the understanding of LID in Wales, the survey of the nature and extent of LID in Wales, the sustainability appraisal of the case studies, and the examination of their planning histories, have generated a considerable body of information about LID in Wales.

9.2 A range of key features and issues have consistently emerged from this information and are addressed below under the headings: *LID and sustainable rural development*; *LID and the local economy*; *LID and planning*; and *Site management, livelihood, and residence*.

These are followed by:

- *A definition of LID for the Welsh countryside*
- *The future of LID and planning*

LID and sustainable rural development

9.3 Sustainability, environmental, social and economic, is a central concern of both LID and Permaculture. Rural sustainability and rural sustainable development are concepts lacking precise definition, and sometimes the focus of disagreement. This should not be surprising as sustainable rural development could take many forms.

9.4 Rather than defining what sustainable rural development *is like*, a more sophisticated approach is to set *objectives and criteria* for sustainable rural development against which different types of development might be evaluated. *Planning Policy Wales* (2002) takes such an approach and also suggests that planning policies be criteria-based.

9.5 Such an approach has formed the basis for the sustainability appraisal of the case studies in this research.

9.6 The questionnaire survey of the nature and extent of LID in Wales, has revealed strong agricultural and forestry elements of LID, often supporting subsistence-based livelihoods. Formal management plans for habitats and whole holdings were in place in some cases, with informal management plans being common. However, not all those responding showed a clear link between habitation and land management. Low impact buildings were not common (mainly because of planning problems) but were desired by LID residents. Efficient use of energy, water, and transport were frequently reported, as was waste minimisation and local pollution control. Significant employment was provided on the sites with most other employment being local. Relationships and links with local communities were generally good. According to the questionnaire responses, 25 % of those living on a LID and 38% of those planning a LID spoke some Welsh, compared to the national average of 18% (Beaufort 2001).

9.7 Overall, LID was clearly identified as a means to a more sustainable way of life, and when asked to identify the sustainability issues they were seeking to address, most LID respondents to the questionnaire aligned themselves with a large range of sustainability issues. Their main concerns were environmental, but significant social and economic rural sustainability contributions were also identified.

9.8 The sustainability appraisal of the case studies gave more detail of the sustainability attributes of LID. The headlines for the appraisal were drawn from national policy, as were the objectives and most of the criteria. Additional criteria were selected to reflect the particular nature of LID, based on previous appraisals.

9.9 In general the cases studies performed well, and no negative scores were recorded in selected examples. The cases chosen for each of the four headlines were those where good information existed, and thus it may be that other cases would have performed less well for these headlines. The purpose of the appraisals was not, though, to come to an absolute judgement on the sustainability or otherwise of LID in Wales. Instead it was intended to provide illumination of the sustainability attributes of a variety of LIDs and a more general impression of the sustainability performance and potential of LID in Wales. We go on to recommend that there cannot be a single definition of LID in Wales: nor can there be a 'yes' or 'no' answer as to whether LID is sustainable or not. It is possible, though, to evaluate the performance of individual LID proposals against a range of sustainability objectives and criteria and thus to come to a decision as to their contribution to rural sustainability. The sustainability appraisal used in this study has assisted the identification of objectives and criteria for judging the sustainability of LID in Wales.

9.10 The sustainability appraisal of the case studies showed:

Social progress which recognises the needs of everyone

- LID has a role in providing low cost rural housing, which has the potential to be far cheaper than any 'conventional' housing
- the quality of housing provided is acceptable to those wishing to live on a LID
- LID residents, as a result of the very 'local' nature of their lives, usually form strong linkages with local services and facilities
- contrary to some opinion, relationships with local communities are usually good and sophisticated
- that although incomers are a feature of LID, so are Welsh people, sometimes with local origins
- the proportion of LID residents speaking Welsh exceeds the national average, and there are many links to Welsh culture
- residents of LIDs consistently suggest that theirs is a very healthy lifestyle.

Effective protection of the environment

- habitat management and the support of biodiversity are key characteristics of many LIDs
- where a LID project is correctly conceived and implemented (perhaps adopting Permaculture approaches) there can be significant local environmental benefits as a result of LID (and potential for grant assistance)
- landscape impact of LID is usually low. It is a central concern of LID to blend with the surroundings
- LID can conserve and enhance the existing built environment. It embodies a strong interest in environmentally low impact buildings which tend to be innovative rather than traditional in design and materials.

Prudent use of natural resources

- pursuit of natural resource efficiencies is intrinsic to LID
- waste minimisation and recycling are common on LID due to both increased levels of self-sufficiency, high awareness of waste management and use of technologies such as compost toilets
- systems for land management and other features of LID tend to minimise pollution
- LIDs frequently incorporate environmental education and the promotion of environmental good-practice
- it is a central feature of LID to make good use of food and other resources such as building materials from site
- use of renewable energy is common in LIDs as are low levels of energy use and high levels of energy efficiency, though this does vary, particularly when purpose-designed low impact buildings have not been built
- the widespread use of local and recycled building materials means that materials used for LID frequently have low embodied energy, and that the use of non-renewable resources is minimised
- though LID sometimes re-uses buildings, it does not often re-use previously developed land
- LID often utilises sustainable water sources such as springs and wells. Grey-water processing through reed beds is common
- due to low domestic and transport energy use, greenhouse gas pollution from LID is low, though local air pollution from burning wood could be a problem
- LIDs tend to make significantly reduced and more efficient use of transport compared to the average UK household, particularly reducing car ownership and use

Maintenance of high and stable levels of economic growth

- most cases were contributing to diversification and enhancement of the rural economy, usually through activities connected to agriculture and / or forestry
- contributions to the cash economy are usually modest to very modest, as LID involves a significant degree of subsistence activity, but LETs and other systems of non-monetary local exchange are common
- involvement in the local economy typically involves the sale of food and other produce and products from the holding, some educational activities, some provision of jobs for local people and some residents taking part-time local jobs
- many economic activities on LIDs maintain, enhance and diversify traditional rural skills
- unemployment levels are very low, as is the use of state support, although entitled
- wealth creation is low but the use of indigenous resources is high.

9.11 From this summary it is clear that LID offers many sustainability benefits to rural areas. The five cases selected all showed clear commitment to the sustainability aspirations of LID, although individually they performed differently.

This emphasises the importance of rigorous and detailed assessment of the sustainability characteristics of LID in order that LID might be distinguished from other types of development with greater environmental impact or lesser commitment to sustainability.

9.12 The results of the review of the nature and extent of LID in Wales and the appraisal of the five case studies do not suggest that all LIDs in Wales currently have strong sustainability characteristics. But it does indicate that sustainability criteria can be used to identify genuine Low Impact Developments. They also indicate that LID may have a role to play in the diversification of the Welsh countryside in pursuit of sustainability objectives.

LID and the local economy

9.13 LID's strongest performance is in environmental and social areas. Whilst there is good evidence of detailed links with local rural economies LID does not tend to produce large monetary contributions. Indeed, it could be argued that it never sets out to do so, and if it did might not be able to make such significant environmental or social sustainability contributions.

9.14 It is a characteristic of many of the residents of LIDs that they have only limited involvement in the cash economy. It is intrinsic to LID that many of the residents' needs (such as food, energy and building materials) are met from the resources of the site. The main cost of such resources is time, therefore, and not money.

9.15 It is also the case that many of the sustainability outputs of LID find low economic reward, particularly those arising from environmental management. Where products and services are sold they are frequently only modest generators of income as they are often the result of 'surpluses', either of produce from the site or the result of surpluses of time, and thus they are not the main purpose of activity on the site. In addition, when the resources of the site are used to generate products for sale, such as herbs or wooden craft items, these are not high value items. The cash returns from LID, therefore, are relatively low, although they are frequently locally distributed, and barter, exchange and LETs are quite common.

9.16 It is an obvious corollary that a LID livelihood is not at all expensive as the majority of everyday needs are met from the site at minimal or no cost. Particularly significant are the costs of shelter and the obviated costs of transport.

9.17 Thus a situation is created where many of the sustainability outputs of LID are only *economically possible* because people are able to live and work on site, utilising the site's resources. If the residents had to meet the costs of shelter elsewhere (such as a local village) and travel to the site each day, this situation would become *economically impossible*.

9.18 It follows that LID therefore enables people to live and make productive use of land in situations where it would otherwise not be economically viable because of the choice of a different type of livelihood that LID involves. Once there, the LID residents support, in however modest a fashion, local services, facilities and the local economy.

9.19 Coed Hills Rural 'Artspace' is an unusual case but shares certain features with this more general picture, as the community suggests that without the freedom of minimal living costs and time, which a LID livelihood allows, they would not be able to provide arts facilities or run events and exhibitions.

9.20 There was a supposition in several of the interviews for this study that LID residents were predominantly only able to support their existence through claiming benefits. This is a sensitive subject, since benefits are used to support the existence of people in a variety of situations. Across the five case studies though, only two people were claiming benefits: one because she was entitled to a disability benefit and one signing on for six weeks (after which she would sign off) in order to become entitled to training assistance through the Princes' Trust. Many of the residents were eligible for benefits but it was consistently reported across all the case studies that they had chosen not to take up their entitlements as this did not accord with the values accompanying their living on a LID and because living on a LID greatly reduced the costs of living which they would otherwise have to meet through state support.

9.21 This also raises the alternative ways of life which LID residents might pursue if they did not live on a LID. Before moving to the site the owners of Tir Sisial were both long-term unemployed and claiming benefits, including housing benefit to cover the cost of their rented housing. A significant part of their motivation to move to the LID was to extricate themselves from this situation of dependency on the state, both by drastically reducing their housing costs and by being able to start a business. Other LID residents also made the point that LID livelihoods effectively allowed them to live more independently from the state, making greater net contributions to the economy and society than would be the case were they to pursue a more 'conventional' lifestyle.

The control case

9.22 That the control case (a 24 hectare diversified livestock farm) performs poorly in terms of environmental sustainability is not surprising as it is typical of much development in rural Wales, in that it pays little detailed attention to environmental issues and is heavily car-dependent. The business is of obvious economic and social benefit.

9.23 It is interesting that the management of the wider holding is only linked to the farm business through the herd of Welsh Black cattle, and that overall environmental management is low. This contrasts with the LID cases where there is far greater integration of activities and environmental sustainability benefits.

LID and planning

9.24 Many of the activities comprising LID do not require planning permission as they are agricultural or forestry activities. Some activities, such as the processing of products from the site, could arguably require planning permission but are of such a small scale, and similar to activities already undertaken on many conventional farms, that the requirement for planning permission would be unlikely. Temporary uses such as running courses or short events are also unlikely to require planning consent. Employment generating uses such as equestrian activities, small scale manufacturing or consultancy may require planning permission but are likely to be supported by policies encouraging diversification of the rural economy, and farm diversification in particular.

9.25 As the views expressed in the questionnaire survey and the case studies clearly demonstrate, the two significant points at which planning policy and decisions, and LID, currently come into conflict are:

- the issue that for most LIDs there is a desire to live on the site

- broader issues of sustainable development.

Dwelling on site

9.26 The cases of Brithdir Mawr, Tir Penrhos Isaf and Tir Sisial all demonstrate the broader experience in Wales, whereby residential accommodation as part of LID is considered, by planning policy and in subsequent decisions, in terms of the functional and financial tests for agricultural and forestry workers' dwellings. Judged against these functional and financial tests LID usually fails and is refused planning permission. Tir Sisial is currently being asked to provide justification for their continuing residence on site against these tests. Brithdir Mawr and Tir Penrhos Isaf have both had these issues considered at appeal where, effectively, both decisions went against them. The Roundhouse Project has been conditioned to prevent habitation and the permission is temporary thus avoiding the establishment of the principle of residential development on the site. Coed Hills has not yet raised the issue of additional accommodation.

9.27 At Brithdir Mawr, the Inspector dismissed the functional need for the residents of the roundhouse to live on site, considering that the holding was of 'low-level viability', and that the financial test was therefore also failed. He also considered that the other activities undertaken by them on the holding, such as woodworking and music making, did not require their presence on the site. At Tir Penrhos Isaf the Inspector was equally direct in dismissing the functional need for the proposed dwelling, and by discounting the horse training and other activities of the residents, also considered that the financial test could not be met.

9.28 It is not surprising, however, that LIDs should fail these tests for agricultural and forestry workers' dwellings. These tests have been developed to address the considerable abuse of this area of policy by those seeking valuable new houses in the open countryside. They aim to expose bogus (non agricultural / forestry) proposals. Thus policy seeks certainty that there is a genuine need for residence on the site (the functional test) and that the agricultural business giving rise to this need is sound (the financial test). Consequently when planning permission for new agricultural workers' dwellings is given, the holding and the house may be tied to one another by legal agreement.

9.29 The residents of LID are not trying to be commercial farmers. Theirs' is a subsistence-based and multifaceted land-based livelihood and so they are rarely able to satisfy either the functional or financial expectations of policy drawn up with conventional farming in mind. LID does not seek intensive rearing of animals, substitutes mechanical work with that of people and animals, exchanges fossil fuels and agri-chemicals for time, and substitutes the need to earn sufficient money to purchase life's daily requirements by harvesting them instead from the site, or simply by seeing some of them as unnecessary to their livelihood.

9.30 In many ways it is right that LID should fail the functional and financial tests. They are designed for agricultural and forestry workers, not those pursuing or wishing to pursue LID. If LID were bent to the requirements of the tests it would most likely lose its intrinsic quality of low environmental impact.

9.31 Also, with the number of agricultural workers and holdings in Wales continuing to decline, and farm incomes collapsing, it is hard to see how the need for additional agricultural workers' dwellings can be justified. Further, policy for agriculture and rural development is increasingly encouraging farm diversification (both on and off-farm), bringing the assumptions of the functional test, in particular, into considerable doubt.

9.32 The tests for agricultural and forestry workers' dwellings clearly do not fit LID. If it is accepted that LID can, in very specific circumstances, bring positive

environmental sustainability benefits, it is clear that new criteria are needed in planning policy for its assessment.

9.33 In addition, in the case of Brithdir Mawr, the Inspector found that the roundhouse was damaging to the landscape of the National Park due to its unconventional design and materials, and its isolated situation, though this is a contested view.

9.34 So dwellings, as an element of LID, often fail current planning tests. But LID residents, or potential residents, see a dwelling as an integral part of LID, and a critical element of its sustainability credentials. It is a common argument that living on site allows dwellings of unusually low environmental impact to be built which are affordable and, because they allow the residents to live adjacent to the other features of the LID, significant economies of resource use, travel and time are possible. In turn, this allows for environmental management and other sustainability benefits that would not otherwise be achievable. Thus living on site is usually seen as crucial to the sustainability performance of LID.

Sustainability

9.35 The pursuit of sustainable development is now at the heart of Welsh policy, including planning policy. The survey of the nature and extent of LID in Wales identified that sustainability was also a prime concern for those living on or with an interest in LID. The sustainability appraisal of the five case studies identified that LID generally scored highly in contributing to rural sustainability.

9.36 It is clear that the livelihoods of LID residents generate a considerably reduced impact on the environment, and give rise to more environmental benefits than is normally the case with conventional development. Also, the LIDs studied lend significant support to local communities, often support the Welsh language and culture, and make modest, yet positive, contributions to the local economy. **In the context of rural Wales, therefore, it is a clear conclusion that LIDs can, compared to current conventional rural development, be a particularly sustainable forms of development.**

9.37 Before this topic is explored in greater detail, the treatment of sustainability in the planning decisions of the five case studies is examined.

9.38 In the two appeals (for Brithdir Mawr and Tip Penrhos Isaf) sustainability was raised. For Brithdir Mawr much evidence at the Inquiry addressed both the sustainability attributes of the holding as a whole and of the roundhouse in particular. In his decision the Inspector noted only:

"With regard to the claimed sustainable nature of the appeal dwelling, bearing in mind that all new development should be sustainable, this is not of substantial weight. At the same time, whilst Brithdir Mawr as a whole claims to be a model of sustainability in operation, the contribution which the appeal dwelling makes to this is so small as to be minimal".

9.39 Thus, although sustainability is given considerable weight in Welsh planning policy and elements contributing to sustainable development are complex and involve many issues, it was not given in-depth consideration at this Inquiry. Clearly the assumption that all new development should be sustainable ignores the current evidence that many new developments have yet to achieve sustainability objectives.

9.40 In their proof of evidence for the appeal at Tir Penrhos Isaf Snowdonia National Park Authority quoted their own Local Plan Policy, Policy PC 2, which states that:

"... the authority will encourage the principles of sustainability by permitting development which satisfies the following principles:

- i. Supports the viability of local services and existing identifiable communities.*
- ii. Enhances the quality of the environment and avoids pollution.*
- iii. Uses or recycles the resources of the National Park efficiently or promotes the use of renewable resources.*
- iv. Minimises the need for unnecessary motorised transport movements and encourages the efficient use of public transport.*
- v. Incorporates the concept of lifetime homes, good building design and improves energy and water conservation.*
- vi. Improves the quality and speed of information transmission.*
- vii. Reuses redundant, underused buildings or derelict and contaminated land.*
- viii. Increases the biodiversity of the Park.*
- ix. Enhances the special qualities of the area or the public's enjoyment of these qualities, now and in the future".*

9.41 There was no attempt, though, to examine the merits of the development by these criteria, even though the proposed development would directly satisfy six of the nine criteria, partly satisfy two, improving the quality and speed of information transmission being the only failed criteria.

9.42 In his decision for Tir Penrhos Isaf the Inspector did address sustainability:

"I have some sympathy with their argument that, as this is a very small house, built of local materials, of a construction which would not impact on the landscape, directly related to a management of the land that demonstrates the principles of sustainable rural development and which has, by the management of the land and by a variety of means, created a modest income for a family over several years".

However, he went on:

"I do not, however, accept their conclusions that by treating the proposal as a 'one-off' departure from policy and by imposing conditions or by seeking a unilateral undertaking by way of a Section 106 Agreement would overcome any adverse repercussions if the enterprise should fail".

9.43 Thus the Inspector, while recognising the sustainability merits of the proposed development, reflected that he could find no way of securing them under the planning system and so would not allow the development.

9.44 In his review of Low Impact Development, sustainable development and the planning system, Scott (2001) takes Brithdir Mawr as a case study. He contrasts the view of the academic literature of sustainability as a holistic and trans-disciplinary approach with the essentially piecemeal perspective offered by planning policy and the Brithdir Mawr decision in particular. He comments:

"The real concern is that sustainability, which is supposed to lie at the centre of the planning system, appears to have very little overall account in the inquiry procedures and planning documentation in any practical sense. It is only defined in

respect to extant development plan policies, rather than any intrinsic assessment of a particular development's sustainability credentials".

9.45 This research, drawing on a wider range of evidence, reaches similar conclusions. As argued in chapter 7 of this report, Low Impact Development has the potential to deliver significant environmental benefits, some local community benefits, and also some local economy benefits, although as identified earlier in this chapter, these may be of a modest scale because of the essentially self-sufficient ethos of LID. Thus LID scores positively against the three parameters of sustainability - environment, community and economy - but we face a paradox whereby development of high intrinsic sustainability is being rejected by a planning system that is centrally concerned with sustainable development.

9.46 The reason is because LID is not evaluated in terms of its sustainability attributes but rather according to whether it satisfies policy expectations for agricultural workers' dwellings. Whilst there is cognisance of sustainability in both appeal decisions, it is given little detailed consideration and thus weight. Instead the decisions quickly resolve to wholly narrower issues. This is, in turn, partly a reflection of the rural planning policies which guided the decisions, where sustainable development is mentioned, but appears to carry little application or weight next to longer-established policies seeking to protect landscape or permit agricultural workers' dwellings as justified exceptions to a general presumption against new development in the open countryside.

9.47 As the Inspector for Tir Penrhos Isaf found, although the sustainability merits of LID (especially environmental sustainability) may be apparent, it is hard for planning policies and decisions to recognise them without innovation in either decisions or policy. This impasse was also noted by planning officers in interview, who agreed both that they were unable to take the full sustainability credentials of LID into account and that, crucially, were they to permit LID on the basis of its strong sustainability performance, they would have no means of ensuring that the development delivered, and continued to deliver, its sustainability promise. Against a background of high pressure for new housing in the countryside and considerable experience of abuse of the provision of agricultural workers' dwellings, in particular, they were thus fundamentally and necessarily suspicious of LID, not because of what it was but because of what it might become.

Summary

9.48 Though there are limited examples of LID being granted planning permission in the UK, such as Tinkers Bubble in Somerset, these are very much exceptions to a norm of refusal through failure to meet the functional and financial tests for agricultural workers' dwellings.

9.49 The crux of the dilemma of rural LID and planning is the desire to have a dwelling on site to assist in the achievement of environmental sustainability objectives.

9.50 The planning history of the case studies, and particularly the two appeals, clearly illustrates the nature of the dilemma. In both cases essentially both local authorities and Inspectors recognised the integral and interdependent nature of residence on the site, but found little in national or local policies which adequately recognised this. In addition, the policies appearing to be most applicable, those for agricultural workers' dwellings, are a poor fit with LID. Faced with such a situation decisions to allow the developments would have been bold as they would have had to establish, in both cases, justified exceptions to prevailing planning policies. The

considerable discourses in the case of both appellants on sustainability and the need for residence, and the final planning decisions, show how current planning policies struggle and arguably fail to properly consider all of the land use attributes of LID. This is not a criticism of individual local planning authorities or Inspectors, but of the planning system and its policies.

9.51 The planning system and LID thus find themselves in a quandary where manifestly environmentally sustainable rural development is being opposed by a planning system which lacks the means to appreciate it and properly control it. The core policy document for sustainable development in Wales is subtitled '*Learning to live differently*'. LID is an example of such a challenge. Mechanisms by which the sustainability qualities of LID can be assessed and mechanisms by which LID might be properly controlled, are needed.

Site management, livelihood and residence

9.52 A key characteristic of LID is the linking and interdependence of activities to minimise resource use and maximise sustainability benefits. Part of this interdependence is the need to live on site. This recognises that many of the activities of LID (which focus on self-sufficiency) are not financially rewarded, and thus would not be possible were considerable saving of time and money not made through living on the site. Also by living on site the environmental impacts of the necessities of life : shelter, weather, food, fuel and so on, can be reduced as they are incorporated into a system of local environmental management.

9.53 Thus, the conundrum is that LID will often require a residence on site to achieve its sustainability potential. Yet in planning terms, a residence in the open countryside without clear justification is in conflict with national planning policy.

9.54 This means that one of the greatest sensitivities of rural planning, new houses in the countryside, is raised if the sustainability benefits of LID are to be achieved. Thus proper means of identifying, judging and ultimately controlling LID are needed.

A definition of LID for the Welsh countryside

9.55 For the purpose of the land use planning system, providing a definition of LID is difficult. Whilst there is attraction in a simple, watertight definition, such as that which exists for agriculture under section 336(1) of the Town and Country Planning Act 1990, it must be remembered that LID (as defined in this report) is an integrated land use. Thus a LID project might comprise agriculture, forestry, other land management, a range of other employment activities, education and training activities, residential use, renewable energy generation and other, more 'one off' activities such as the provision of a working space for artists as at Coed Hills. The relationships between these activities will not be straightforward as often all activities will be integrated elements of the LID as a whole.

9.56 Also, it is inherent to the concepts of LID and Permaculture that the precise nature of their application will vary from site to site and with the different people involved.

9.57 So to provide a straightforward definition of LID for Wales is difficult. Rather, it is suggested that LIDs should be identified and evaluated by their sustainability characteristics as these relate to land use (the focus of the land use

planning system). These suggested sustainability characteristics or criteria⁹ are set out in Table 9.1. In combination, these provide a definition of LID in terms of:

- the core elements of LID ie elements that are essential to the definition of a LID and must be found in all LIDs.
- other important features of LID that need not be found in every case but of which there should be a range present.

9.58 There are some themes and characteristics of LID which land use planning can directly control, some over which it can have only limited influence and some where linkages are weaker. This is the same for most types of development, and it is common for planning to seek to influence personal or commercial behaviour through permitting a particular type of development and controlling certain elements of its use, with the aspiration that the personal and commercial behaviour of users will be influenced. Perhaps the most obvious example is the strategic approach to settlement planning for rural areas, which seeks to locate development at accessible locations with the aspiration of reducing travel by the private car.

9.59 For LID it will appropriate to seek substantial control over elements of the development and, although all aspects of LID cannot be controlled, those that can should mean that the few elements of LID that remain outside the reach of land use planning, are unlikely to cause concern. From our discussions, it is very unlikely that genuine LID applicants would object to such rigorous control of LID.

9.60 The following definition also demonstrates the fundamentally integrated nature of LID. Residence on the site cannot be seen as separate from the management of the site or the livelihoods of the residents. Thus a house of highly sustainable design alone, an 'eco-house', or even an eco-village would not constitute LID and should not be allowed as such (though they may be desirable in other circumstances). LID must be viewed as a sum of its parts.

⁹ The definition of LID for the Welsh countryside draws to an extent on previous policy and definitions such as the Simon Fairlie's nine criteria (1996) and the 15 criteria of TLIO (1999). All of Fairlie's nine criteria are reflected in the definition, but often presented with greater precision. Similarly the 15 criteria of TLIO are all reflected in the definition but have been made more specific and this identifiable and ultimately enforceable. There are two exceptions:

4 *The project can demonstrate how it will be integrated into the local economy and community.*

This criterion is essentially aspirational. Features leading to community and economic integration cannot be easily defined though these outcomes are frequent for LID.

15 *The project can show that affordability and sustainability are secured, for example, by the involvement of a housing association, co-operative, trust or other social body whose continuing interest in the property will ensure control over subsequent changes of ownership and occupation.*

Rather than being an issue of definition this is an issue for means of control.

Table 9.1 A definition of Low Impact Development for rural Wales: a Low Impact Development is one which has all of the themes and characteristics highlighted in bold in the table below and also those not highlighted where indicated by the circumstances of the individual case..

<u>Theme</u>	<u>Characteristic</u>	<u>Commentary</u>	<u>Criteria</u>
SITE MANAGEMENT	Integrated site management	Integrated management of the site is central to the notion of LID. An integrated site management plan should be the key document explaining the LID. It should provide both an overview of the intended use and management of the site as a whole and give more detail on the range of activities that will take place and how they interrelate. Thus it should address the characteristics of LID below.	There should be an integrated site management plan for the whole site, describing the site, setting out the aims and objectives for its management and use as a whole. The plan should aim to address all of the characteristics of LID in this table. The plan may be in the form of a Permaculture design if desired.
	Environmental Management	Environmental management of the site is a crucial component of LID. Thus a detailed environmental management plan is required. The plan should encompass both habitat and landscape issues.	There should be an environmental management plan for the whole site, detailing the existing state of the site, setting aims and objectives for its management, and a detailed programme for their achievement and monitoring, and giving a suitable period for ongoing review.
LIVELIHOODS	Self-sufficiency	Much of the low environmental impact credentials of LID arise from the ability to meet many day-to-day needs from the resources of the site rather than having to acquire them from elsewhere. It is not expected that LID should be entirely self-sufficient. There can be considerable benefits in the involvement of LID residents in the local economy and community. It is expected, though, that the livelihood of residents will be subsistence-based and substantially based on the resources of the site.	The livelihood of residents will be subsistence-based and based on resources of the site. The integrated site management plan should detail the anticipated makeup and livelihoods of the residents, including contributions from the site and those from elsewhere. This should include financial plans for any business proposed to be run from the site.

	Residence on site	Residence on site is often crucial to securing the sustainability benefits of LID. Nonetheless there should be well-justified reasons for living on site. LID offers the provision of a particular type of affordable housing. This will not meet the majority of needs for affordable housing in rural areas, though, and provision of affordable housing alone is insufficient justification for LID.	proposed to be run from the site. There should be a detailed reasoned justification of the necessity of residence on site, linked to the consideration of livelihoods (above).
AGRICULTURE, HORTICULTURE & FORESTRY	Environmental impact	The agricultural, horticultural and forestry activities on site should aim to minimise environmental impact. This might be through the adoption of organic or Permaculture methods, or others.	The environmental impact of agricultural, horticultural and forestry activities, principally through the use of fossil-fuel powered machinery, chemical inputs, or inappropriate land management should be minimised.
BUILDINGS / STRUCTURES	Reversible	Unlike conventional development, LID seeks buildings that have a low impact on their environment and thus also which might be readily removed from the site, allowing it to revert to its former state.	All buildings and structures on the site should be of a design and structure such that they can be readily removed from the site at the end of their use, leaving minimal environmental disturbance.
	Materials	In keeping with a low environmental impact, the materials used for LID should be of low environmental impact.	Materials used on the site should be of low embodied energy, low environmental impact and, where appropriate, locally-sourced.
	Re-use	The re-use of building and other materials and resources can reduce the environmental impact of development.	Where possible buildings, other materials and resources should be re-used.
	Scale	Environmental impact is minimised where development is of no greater scale than is necessary to meet the needs of the development. <i>This does not mean that all proposals for LID have to be very small, but rather that the</i>	Development should be of a modest scale, no greater than is necessary to meet the needs of the development

for LID have to be very small, but rather that the development footprint of LID is as efficient as its needs allow.

	Visual intrusion	LID should aim to be unobtrusive. <i>This does not mean that LID should always adopt vernacular styles or materials as to do so might conflict with the other important characteristics of LID.</i>	Development should be unobtrusive, minimising landscape impact.
TRANSPORT	Minimising car use	LID, by meeting many residents' needs on site and through the potential to share vehicles, has great potential to minimise car use.	A transport plan should prioritise the minimisation of car use. A low maximum number of motor vehicles to be operated from the site should be set.
ENERGY	Minimising energy use	Reducing energy use is an important component of lowering environmental impact.	The use of energy on the site should be minimised.
	Renewable energy	The use of renewable rather than non-renewable sources of energy is also important in reducing environmental impact.	The use of non-renewable energy should be minimised.
WATER	Water source	Utilisation of mains water increases environmental impact.	Where possible water will be from sources other than the mains.
	Waste water	Minimisation and management of waste water on site reduces environmental impact.	Black and grey water production should be minimised and all waste water should be treated on site.
WASTE	Minimisation & management	Other than water (above), the minimisation of all other wastes reduces environmental impact. Re-use, recycling and waste processing on site, such as composting (including compost toilets) should be used to minimise the site's production of waste.	Re-use, recycling and waste processing on site by environmentally-friendly means should be used to minimise the site's production of waste.
WELSH LANGUAGE &	Welsh language	The health of the Welsh language is an important policy concern in rural Wales. If possible LID should be supportive of the Welsh	LID should support the Welsh language where possible

LANGUAGE & CULTURE		rural Wales. If possible LID should be supportive of the Welsh Language.	possible.
	Culture & traditional skills	Support for Welsh culture in rural areas and the maintenance of traditional skills are important policy considerations for rural Wales. LID should support Welsh culture and traditional skills.	LID should include means of supporting Welsh culture and traditional rural skills
ACCESS	Access & education	Access to LID sites for members of the public, either informal or through organised events or courses, can offer sustainability benefits as environmental good-practice is disseminated and links with the local community are fostered.	Where possible the LID should allow some public access, either informal or formal (tours, events, courses) as appropriate.

The future of LID and planning

9.61 It is a clear conclusion of this research that LID sites and the lives of their residents can result in considerably reduced environmental impact compared to conventional rural development and lifestyles. The environmental sustainability benefits of LID are strong. Thus two of the headlines of national policy for sustainability and many of the *Planning Policy Wales*' (2002) sustainability objectives concerning the environment are substantially met.

9.62 The remaining elements of sustainability are social and economic. The social contributions of LID are diverse. Local communities rarely oppose LID and LID residents are frequently well-engaged with local community activities. In addition LID provides an element of affordable housing, though not of a type acceptable to all.

9.63 LID is not a major contributor to high levels of economic growth and LID does not produce high income levels for its residents. LID's economic strengths are that it makes high use of indigenous resources, fosters rural diversification and shows a high proportion of involvement in the local economy.

9.64 In terms of overall sustainability the environmental performance of LID is undoubtedly strongest. Its social contribution is clearly positive and its economic contribution, whilst undeniably small, is also positive. Both the social and economic impacts of LID are predominantly local.

9.65 Considering the sustainability of LID as a whole, it is important to note that LID does not undermine any aspects of sustainability. Although the economic contribution in particular is not large, it remains positive and, because of the nature of LID, it is intrinsically linked to the social and environmental benefits. Development which performs strongly environmentally, socially and economically is unusual. Development with economic or social benefits often carries environmental harm. It is arguable that were LID to strive for stronger economic performance its environmental benefits in particular would be compromised.

9.66 In the context of rural Wales the findings of this study demonstrate that LID can offer a positive contribution to sustainability. Its particular strengths are environmental, and these, taken with its social and economic effects, suggest that LID has a valid place in the Welsh countryside as a component of broader sustainable rural development.

A new use class

9.67 Thus how to incorporate LID into the planning system should be considered. The creation of a new Use Class for LID has been suggested, but this is not appropriate. Most activities of LID fall outside the planning system, being agriculture or forestry, and thus fall outside the scope of Use Classes. The elements which do fall under planning are residential or employment activities. Use Classes are permissive simplifications of planning control. The precise nature of LID will vary in response to different sites. As Use Classes simplify planning control it is very difficult to see that a Use Class could define the elements of LID falling under planning control sufficiently tightly to prevent abuse whilst giving sufficient flexibility in its applications. In addition, the means of control available under a use class to ensure the maintenance of LID would be weak.

A rigorous appraisal of LIDs

9.68 Instead a means to both identify and judge LID in detail is needed. The definition of LID in Table 9.1 offers a means to do this. This definition could be incorporated into both national and local planning policies. Scottish national policy already contains a less detailed approach for LID, and the examples of plan policies in chapter 4 demonstrate that more detailed policies can be drawn up, including the usual requirements for neighbourliness. The contents of such policies are explored in the recommendations.

9.69 The use of a detailed and systematic evaluation of LID would ensure that all proposals are dealt with equitably, as the development is evaluated by its sustainability land use characteristics and nothing else.

9.70 Using the definitions of LID in rural areas provided by this report (Table 9.1), provides a rigorous means of identifying genuine LIDs and assessing their sustainability contributions, setting a more thorough test for development than is normal, and ensuring that anyone allowed to live in the countryside through LID can only do so because of the clear sustainability benefits of their development.

9.71 In National Parks and Areas of Outstanding Natural Beauty (AONBs) the consideration of LID should not be significantly different. Both are still living landscapes where the pursuit of sustainable development is no less important. Thus LID should be no less at home inside a National Park or AONB than elsewhere, showing equal concern for its local environmental and social and economic context.

Settlement strategy

9.72 LID raises issues concerning settlement strategy. It is a long-established principle of rural planning policy that development be directed to settlements and away from the open countryside. LID, following the definitions adopted in this report, requires access to land, and so is most likely to be found in the open countryside. This is not to say that LID would be impossible within or adjacent to villages or towns, or on brownfield land. But LID, as defined in this report, is a relatively extensive land use. Thus the location of LID in or adjacent to settlements, and particularly on brownfield sites, could stand contrary to needs to locate other development on the limited land available.

9.73 Strategically, it is unlikely that *inside* settlements will be the right location for LID as defined in this report. The edge of settlements may be more suitable but should be considered carefully in relation to other development needs. LID closer to settlements is likely to perform better, particularly in terms of transport sustainability, and opportunities for economic and social interaction may also be enhanced. LID's other sustainability attributes would be less effected. In addition land prices in and around settlements might be high, which would mitigate against LID.

9.74 Rigorous planning policies for LID would create an exception to the prevailing presumption against development in the open countryside. This exception would only be justified by LID's contribution to rural sustainability under a range of headings. Allowed on this basis (and adequately controlled) policies would be fair and equitable. Those wishing to live in the open countryside but unable to justify this as LID developers, would be rightly prevented from doing so. Such policies are also unlikely to cause Human Rights breaches (see paras 4.25 - 4.36)

Control of LID

9.75 The method of controlling LID is the other critical component to allow LID to be better considered by the planning system. It is essential that sufficient control is available to prevent development allowed as LID becoming something else. The principal concern is that the residential accommodation would be occupied without the other components of the LID in place, effectively becoming just a house in the countryside. Experience of abuse of agricultural workers' dwellings casts a long shadow in this area.

9.76 In the face of considerable scope for abuse the main concerns are:

- ensuring the physical features of the LID are put in place
- ensuring the site management takes place
- ensuring that self-sufficient livelihood takes place
- ensuring reversibility
- monitoring the development over time

9.77 There is no doubt that detailed means of monitoring and control are required for LID, such is the pressure to gain a new house in the countryside. This means that greater demands will be placed on both the applicant and the local planning authority than is usual for most planning applications.

9.78 Genuine applicants will welcome proper control of their activities. It will, after all, only require them to do what they wish to do in any case and also, importantly, ensure that should they leave, their site cannot be used for less low impact activities.

9.79 Planning Policy Wales (2002) sets out terms for the use of conditions and planning obligations (legal agreements) :

"Conditions on a planning permission can enable many development proposals to proceed where it would otherwise be necessary to refuse planning permission."

4.6.1

"Planning obligations are useful arrangements to overcome obstacles which may otherwise prevent planning permission from being granted" 4.7.1

9.80 This paragraph goes on to state purposes for planning obligations. Those relevant to LID are to:

- *restrict development or use of the land*
- *require operations or activities to be carried out in, on, under or over the land*
- *require the land to be used in a specific way*

9.81 It has been suggested that personal and temporary conditions offer an appropriate means of controlling LID. Personal conditions, though, imply that only one person or group of people can operate a particular LID. This may not be the case and, if for whatever reason, individuals wish to leave a LID it may be the case that others might take their place (including their children) and continue the development, including its sustainability benefits. Thus LID should be judged by its merits as a land use, not by the individuals involved. It is only when the land use changes that the LID fails and its cessation required.

9.82 Similarly, temporary consents also assume that the sustainability benefits accruing from LID are only transitory. This, again, is not necessarily the case and

the desire to control LID should focus on its sustainability performance and its longevity.

It may be that in some cases a 'trial run' for LID proposals will be appropriate for the development to demonstrate its viability. This should not obstruct the LID as it is intended to be reversible, but should be subject to the clear principle in operation for all temporary permissions that in most cases one temporary permission should be sufficient to establish the development's suitability or not, and that a string of temporary permissions is inappropriate.

9.83 Planning obligations offer considerably greater strength and scope for control of permitted land uses, and are voluntarily entered into by both the applicant and the local authority. Some experts of LID will be suitable for control by condition but a planning obligation will be required for adequate control of its major elements.

9.84 The planning obligation essentially needs to perform two functions:

- to monitor and control the day to day use of the site
- to provide an ultimate means of control if the use of the site for LID ceases.

Detailed means of control are outlined in the recommendations.

10. RECOMMENDATIONS

Planning policy

This study has demonstrated that LID has a clear if limited role to play in securing greater sustainability in rural Wales. It has also shown that current policies fail to address this role, and that planning policies for agricultural workers' dwellings, in particular, are inappropriate for the consideration of LID. Thus it is suggested that new policies are required for the specific consideration of LID, particularly in the context of *Planning Policy Wales* (2002) which has added much new policy both for sustainability and rural development.

Recommendation 1: Planning Policy Wales (2002) should contain policy for LID

Planning Policy Wales should contain policy which

- provides a brief description of the objectives and attributes of LID, and the general means by which it should be judged
- suggests that development plans contain more detailed, criteria-based policies for LID

(as existing Scottish policy does)

TAN 6 should provide guidance for the means of control necessary for LID following the criteria and tests set out in Table 10.1 below.

Recommendation 2: Development plans including rural areas should contain policies for LID

The definition of LID for the Welsh countryside (Table 9.1) provides a basis for such policy. Policies should be criteria-based. This study cannot make detailed recommendations as to the form of such policy as they will necessarily vary from place to place. Instead the elements which development plan policy should cover are suggested with a commentary on the issues involved.

Table 10.1 : Factors to be considered in the development of local plan policies and in the appraisal of LIDs

Integrated site management	<p><i>Proposals for LID <u>must</u> include an integrated site management plan. This is a core, umbrella document for LID which depends on integrated use and management of a site.</i></p> <p><i>It should provide both an overview of the intended use and management of the site as a whole and give more detail on the range of activities that will take place and how they interrelate.</i></p> <p><i>The following elements should all form part of the integrated site management plan, but are dealt with separately for clarity.</i></p>
Test: the test for integrated site management will be an overall test of the sustainability statement which is dealt with last.	
Environmental management	<p><i>There should be an environmental management plan for the whole site, detailing the existing state of the site, setting aims and objectives for its management, and a detailed programme for their achievement and monitoring, and giving a suitable period for ongoing review. It should cover habitat and landscape issues and the interrelationships between</i></p>

	<i>environmental management and other activities on the site.</i>
<p>Test: the use of the site by LID should enhance the habitats and landscape of the site.</p> <p>The environmental management plan should select indicators and set detailed targets for the management of the site's environment.</p>	
Residents and livelihoods	<p><i>Details should be given of the intended makeup and livelihoods of the residents (including contributions from the site and elsewhere) and give accordingly justification for the necessity of residence on the site.</i></p> <p><i>Where is it proposed to run a business from the site financial plans should be submitted.</i></p>
<p>Test: LID is characterised by the ability to meet many day-to-day needs from the resources of the site and the subsistence based livelihoods of residents. LID is not expected to be completely self-sufficient but LID livelihoods should not be possible were the residents not living on the site. The livelihoods should also be integral to the management of the site such that without them the integrated site management plan could not be achieved.</p> <p>The integrated site management plan should set detailed minimum targets for the proportions of residents' livelihoods to be drawn from the resources of the site.</p>	
Agriculture, horticulture & forestry	<i>Details should be given of the methods used and standards to be applied in production.</i>
<p>Test: the agricultural, horticultural and forestry activities on site should minimise environmental impact, principally through the use of fossil-fuel powered machinery, chemical inputs, point source and diffused pollution and inappropriate land management including the destruction of semi-natural habitats and natural landscape features.</p> <p>The integrated site management plan should set detailed targets for agricultural, horticultural and forestry production standards.</p>	
Buildings & structures	<p>Reversibility: <i>the ethos of LID seeks buildings that have a low impact on their environment and thus which can be readily removed from the site at the end of their use for LID.</i></p> <p>Materials: <i>building materials used should minimise environmental impact, they should be of local origin and largely of natural or recycled materials.</i></p> <p>Scale: <i>the scale of buildings and structures should minimise environmental impact.</i></p> <p>Visual intrusion: <i>LID should be unobtrusive.</i></p> <p>Re-use: <i>where a site includes existing buildings and structures they should be re-used where possible. As LID should be reversible the re-use should not change the buildings more than is necessary for the new use, and there should be a clear understanding that should the LID cease so shall the use of the buildings.</i></p>

<p>Tests:</p> <p>Reversibility: all buildings and structures on the site must be of a design and structure such that they can be readily removed from the site at the end of their use, leaving the site to easily revert to its former state.</p> <p>Materials: materials used on the site must minimise environmental impact by being whenever possible renewable, recycled, of low embodied energy and, locally-sourced.</p> <p>Scale: all buildings and structures should be of a modest scale, no greater than is necessary to meet the needs of the LID.</p> <p>Visual intrusion: all buildings and structures should be visually unobtrusive.</p> <p><i>Reversibility, materials, scale and visual intrusion all inform the design of LID. In this respect the form of buildings and structures should follow such functions. In response LID may sometimes involve innovative, novel and unconventional design, which departs from the local vernacular. That buildings and structures are not of a 'traditional' design should not, in itself, count against LID where it would hamper pursuit of these other important objectives.</i></p> <p><i>The details of a building's construction and thus its total environmental impact, rather than just its appearance, should be a planning consideration.</i></p>	
Transport	<p><i>LID, by meeting many residents' needs on site and through the potential to share vehicles, has great potential to minimise transport use, particularly car use, and encourage the use of alternative modes. The integrated site management plan should address transport needs and how they will be met</i></p> <p><i>Certain activities on LIDs may attract a significant number of visitors and thus some LIDs may need to be in locations of better public transport accessibility or incorporate other means to minimise car use.</i></p> <p><i>A maximum number of motor vehicles operated from the site should be set.</i></p>
<p>Test: the integrated site management plan should contain detailed measures to reduce the use of private cars and encourage the use of alternative modes. Specifically a maximum number of vehicles to be operated from the site should be set.</p>	
Energy	<p><i>LID should both reduce energy use and utilise more sustainable energy sources.</i></p>
<p>Tests: The buildings and other users of energy on the site should be designed to minimise energy use.</p> <p>The majority of the site's energy needs should be from renewable sources with detailed targets set.</p>	
Water	<p><i>LID should minimise and treat and recycle all waste water on site. Where possible it should also use water sources other than the mains (dependent on the view of the Environment Agency).</i></p>
<p>Tests: there must be provision to treat and recycle all waste water from the development on site.</p> <p>Where possible water should be taken from sources other than the mains.</p>	

Waste	<i>LID should minimise waste production and reuse, recycling and process waste on site.</i>
Test: the development must include means for waste minimisation and recycling. Where possible wastes can be processed on site. In particular all sewage should be treated on site. Detailed targets for waste treatment should be set.	
Access	<i>LID can increase public access to the site, either formally or informally. This may not be possible or appropriate in all cases.</i>
Test: where possible and beneficial to the public, access to the site should be increased through the development.	
Amenity / neighbourliness	<i>Like other development in the countryside LID should not be harmful to the amenity of neighbouring occupiers and users of land.</i>
Test: the development should not harm the amenity of neighbouring occupiers and users of land.	
Sustainability statement	<p><i>The integrated site management plan submitted with a planning application, in effect, a design for the LID. Following the content of the integrated site management plan, the consideration of the issues above and the application of the tests, it should be possible to assess the sustainability of the LID proposal. Applicants should thus include a sustainability statement, drawing attention to all of the contributions to rural sustainability offered and also where there are shortcomings. Interdependencies of activities and sustainability contributions should be highlighted.</i></p> <p><i>This will form an evaluation of the integrated site management plan for the local planning authority to use as the basis for their own evaluation of the proposals taken as a whole, as integration is a crucial element of LID. It may also inform the need for revisions to the LID proposal.</i></p>
Test: overall the development should make a net positive contribution to rural sustainability.	

Recommendation 3: To succeed, a proposal for LID should meet all of the criteria and pass all of the tests set out in Table 10.1 (with the exception of those for access which may simply not be achievable in all cases)

LID is a fundamentally integrated land use and thus all elements of the LID have to be present. It cannot be acceptable to omit some features or to trade them off against each other. Policy should reflect this.

Although it has been identified that LID has potential to support the Welsh language and also Welsh culture and traditional skills it is not recommended that this be a particular goal of LID. The importance of the Welsh Language as a planning concern will vary considerably across rural Wales and will be addressed by corresponding local policies. These should be sufficient for the consideration of LID, as LID rarely raises specific issues of relevance.

Taken as a whole policy should set an unusually demanding test for LID, as LID is a complex and sophisticated land use. Those wishing to undertake LID should realise this and the demands that LID will place upon them. Policy should ensure that bogus or insufficiently low impact proposals will fail. An added benefit would be

that with a transparent system for the identification and evaluation of LID in place, the temptation to seek LID by hiding development would be considerably reduced.

Recommendation 4: a Permaculture design might make up a substantial element of the integrated site management plan. LID need not adopt Permaculture, but where Permaculture designs are used it should be ensured that all elements of the integrated site management plan are addressed.

Recommendation 5: where a local authority prepares an Integrated Rural Development Strategy (as advised by Planning Policy Wales) it may be appropriate to consider the place of LID in the wider strategy for the local countryside, and for the policy of the development plan to reflect this.

Recommendation 6: Planning obligations should be used as the principal means for controlling LID. The integrated site management plan would form a foundation of the planning obligation to which it should be attached as an appendix (an arrangement which has already been used for Tinkers Bubble - see Appendix 3). Thus the planning obligation will cover:

Table 10.2: Issues to be covered in planning obligations for LID

Overall definition	<p>a) States that the residential development given consent is only for activities in association with the use of the site for LID and should in no way be construed as giving permission for a freestanding residential use.</p> <p>b) States that as such all permitted development rights for the residential accommodation are withdrawn.</p> <p>c) States that no occupier, future occupier or anyone on their behalf, shall claim established use rights for residential use for any buildings approved.</p>
Detailed definition: uses	<p>d) Following the policy and individual circumstances of the case, state the activities or actions (including phasing) which <i>must</i> take place on the site.</p> <p>e) States all other activities allowed on the site.</p> <p><i>These activities and actions will largely be drawn from the integrated site management plan.</i></p>
Detailed definition: structures	<p>f) States the permitted uses of the structures on the site, including which buildings may be occupied and by whom (defined by their roles in working and managing the site as laid out in the integrated site management plan) (1)</p>
Monitoring	<p>g) Sets an annual period for reporting of all activities on the site and progress towards meeting the agreed objectives and actions in the integrated site management plan. Sets a concurrent opportunity to vary the integrated site management plan, uses on and occupation of the site by mutual agreement. (2)</p>
Reversibility (3)	<p>h) Set a penalty for breach of d), f), and g) that, subject to a six month grace period to correct the failures, the use of the site for LID shall cease and all structures approved, shall be removed from the land which shall revert back to its former use.</p>

- (1) Ensuring the residence of a particular type of worker is familiar enough to planning, but LID requires a further step. It is not sufficient to require that the residential accommodation on the site is lived in by a person working on the site. It is also required that the majority of the work on the site is undertaken by the residents. LID depends on the arrangement that the livelihood of the person is mainly derived from the site: a synergy of work and home. Thus, however unlikely, it is important to avoid situations whereby residents of a LID could live on the site but employ others to manage it, undermining many of the efficiencies which are crucial to the sustainability performance of LID. These matters should also be covered by the legal agreement.
- (2) A LID can evolve as the site becomes better understood, the activities on it develop, and as the people involved change. Thus, whilst retaining sustainability benefits, details and features of LID might change, and so will the integrated site management plan. There should be regular reporting of progress towards the objectives of the management plan by the LID residents, probably once a year. The integrated site management plan by the LID resident(s) should also be subject to regular review, say every five years, or more often if necessary.
- (3) Reversibility is an integral feature of LID, which seeks to have no lasting adverse environmental impact. Thus buildings, in particular, are designed to be readily removed from the site. Reversibility is also the key to the proper control of LID. Low impact developers should have no concerns about being asked to make their development reversible. It should be a shared objective. LID residents frequently express a concern for the long-term future of their sites and are as concerned as planners to ensure that it is not despoiled through abuse. As LID is designed to be reversible, it follows that should a LID cease to be LID, for whatever reason, it should be reversed, principally through the removal of the dwelling/s and other structures from the site. The integrated management plan and ongoing monitoring of the site, should provide ample context for such a decision.

Planning obligations run with the land, so they may be enforced against both the original covenantor and anyone subsequently acquiring an interest in the land. Thus the planning obligations will ensure the lasting land use restrictions of the LID, whilst allowing changes of residents, but would also provide a means to stop any other activities on the land which were not LID, and avoid precedent being created for any other development on the land.

Recommendation 7 : In addition to a legal agreement the sustainability objectives of LID should be assured through the land being vested in a court or similar. An additional level of assurance would be gained where the land concerned is vested in a trust, a co-operative, a housing association or another public body that could guarantee that the sustainability aims of the development cannot be subverted by any future owner or occupier (as is already done for affordable rural housing). In particular, the constitution of a charitable trust cannot be altered without the permission of the Charity Commissioners, or the consent of the local authority were this arranged through a legal agreement. In certain cases, such as where a community holds joint ownership of land, securing such arrangements may be appropriate.

BIBLIOGRAPHY

- Abrahams, J (1996) 'WET Systems for Waste Purification & Resource Production' *Permaculture magazine*, 13, pp.10-14.
- Banks J and Marsden T (2000) 'Integrating Agri-Environment Policy, Farming Systems and Rural Development: Tir Cymen in Wales, *Sociologia Ruralis*, 40, 4, pp466-480.
- Barton H ed. (2000) *Sustainable Communities, The Potential for Eco-Neighbourhoods*, Earthscan, London.
- Benham P (2001), 'Gardening a Community', *Permaculture magazine*, 28, pp.7-9.
- Bevan M, Cameron S, Coombes M, Merridew T and Raybould S (2001) *Social Housing in Rural Areas*, report for the Joseph Rowntree Association, Chartered Institute of Housing, Coventry.
- Burrall P (2001) 'Time for action', *Town and Country Planning*, 70 (3) pp 82-84.
- Carpenter P (1994) *Sod It: An Introduction to Earth-Sheltered Development in England and Wales*, Coventry University.
- Clark M (2001) 'Mainstreaming environmental innovation', *Town and Country Planning*, 69 (8), pp218-21.
- Cloke P, Milbourne P and Widdowfield R (2001) 'Interconnecting housing, homelessness and rurality: evidence from local authority homelessness officers in England and Wales', *Journal of Rural Studies* 17, pp 99-111.
- Countryside Agency (1999) *Planning for the Quality of Life in Rural England*, interim planning policy, Cheltenham.
- Countryside Commission (1998) *Planning for Countryside Quality*, Cheltenham.
- Ellis R (2000) Sustainable partnerships - a tale of benders, planners, alternative lifestyles and prejudice, *ECOS* 21 (1), pp49-51.
- Ellis R (2000/02) Sustainable partnerships - part 2, *ECOS* (3/4), pp44-47.
- Fairlie S (1996) *Low Impact Development, planning and people in a sustainable countryside*, Jon Carpenter, Charlbury.
- Fairlie S (2000) 'Noble homes', *Town and Country Planning* 69 (5) pp169.
- Gallent N (1997) 'The Alternative Route to Affordable Housing Provision: Experiences in Rural Wales', *Journal of Rural Studies*, 13, 1, pp43-56.
- Gallent N and Bell P (2001) 'Planning Exceptions in Rural England: Past, Present and Future, *Planning Practice and Research*, 15, 4, pp375-384.
- Green and Away, Glos; and Brook Farm; Somerset; details available from Chapter 7.
- Haraldson H, Ranhagen U and Severdrup H (2001) 'Is Eco-living more sustainable than conventional living? Comparing sustainability performances between two townships in southern Sweden, *Journal of Environmental Planning and Management* 44 (5), pp663-679.
- Hardy D and Ward C (1984) *Arcadia for All: The Legacy of a Makeshift Landscape*, Mansell.
- Hockerton Housing Project (February 2001), *The Sustainable Community: A Practical Guide*, Gables Drive, Hockerton, Southwell, Nottingham.

- Hopkins R (1996) *Permaculture: a new approach for rural planning?* An investigation of the reasons for the success/failure of rural permaculture projects in England and Wales to obtain planning permission, unpublished BSc (Hons) dissertation EQRM, Faculty of the Built Environment, UWE, Bristol.
- Housing Corporation and RICS Policy Unit (2001) *Delivering Affordable Housing Through the Planning System*, Housing Corporation and RICS, London.
- Huggins R (2001) The Skills Economy and its Development: Examples and Lessons from a Rural Region, *Policy Studies* Vol 22, No 1, pp19-34.
- Kneafsey M, Ilbery B and Jenkins T (2001) 'Exploring the Dimensions of Culture Economies in Rural West Wales', *Sociologia Ruralis* 41, 3, 296-310.
- Law B (2001) *The Woodland Way: A Permaculture Approach to Sustainable Woodland Management*, Permanent Publications.
- Littlewood, M (2001), 'Eco-Farming', *Permaculture magazine*, 28, pp.3-5.
- Land Use Consultants (1995) *Planning Controls over Agricultural and Forestry Development and Rural Building Conversions*, Department of the Environment, HMSO, London.
- Mollison, B (1990), *Permaculture - A Practical Guide for a Sustainable Future*, Island.
- Mollison, B & Slay R M (1991), *Introduction to Permaculture*, Tagari.
- Moyses R (1999) 'Low-impact development: a sustainable future for the countryside', *ECOS* 20 (2) pp59-64.
- NAWAD (2001), *Farming for the Future*, www.wales.gov.uk
- Nichol L (1998) *'Underground Housing: Eco-Pioneers, Earth Shelters and the Planning System'*, unpublished MSc dissertation, University of Wales, Cardiff.
- Nichol L et al (June 2000) *Planning for Sustainable Woodlands*, Chapter 7 and the National Small Woods Association.
- Nichol L (2000) *The Impact of the Planning System on Local Food Producers in Somerset*, Oxford Brookes University, Oxford.
- Parry M (2000) 'A sustainable Wales - leaning to live differently', *ECOS* 21 (1) pp85-88.
- Pratt, S ed. (1997), *Permaculture Plot, The Guide to Permaculture in Britain*, Permanent Publications, Hampshire.
- Pretty, J & Hine, J (2001), *Reducing Food Poverty with Sustainable Agriculture*, SAFE-World project, University of Essex.
- Permaculture Association UK (2001), *Unpublished response to the Food & Farming Commission*.
- Permaculture Works* (Autumn 2000), Bendall's Farm; www.BendallsFarm.com
- R v. Swansea City Council (ex parte Elitestone)*, 1993.
- Roaf S and Rookwood R (2000) 'Building to sustainability standards', *Town and Country Planning*, 69 (6), pp24-29.
- Scott A (2001) *'Contesting Sustainable Development: Low Impact Development in Pembrokeshire Coast National Park'*, Working Paper, University of Aberystwyth.
- Sherriff, G (1999), *Edible Ecosystems in Sustainable Agriculture*. MA Dissertation, Keele University, UK. www.edibleecosystems.care4free.net

- Smit J (1998) 'Underground, overground, CO2 free', *Building Homes*, 8, pp56-8.
- Stirling T (2000) *Home at the Hub: housing and social exclusion in Wales*, Chartered Institute of Housing, Coventry.
- Sustainable Communities Ireland (2001) *The Farm Village: A Sustainable Rural Settlement*, www.thevillage.ie/farmvillages/sci.html
- The Land is Ours (1999) *Defining rural sustainability: fifteen criteria for sustainable developments in the countryside* together with three model policies for local plans, a report by the Rural Planning Group of The Land is Ours, Oxford.
- TPS, 21b Palmerston Place, Edinburgh, EH12 5AF, 0131 225 8675, tps@globalnet.co.uk (Report by TPS)
- The Rural Planning Group of The Land is Ours (2001) *Low Impact Development: Progress Over the Last Five Years*, The Land is Ours, Oxford.
- Whitefield, P (1992), *Permaculture in a Nutshell*, Permanent Publications, Hampshire.
- Wrench T (2001) *Building a Low Impact Roundhouse*, Permanent Publications, c/o www.permaculture.co.uk
- Zarb, J (2001), 'Permaculture & the Future of Farming', *Permaculture magazine*, 29, pp.25-29.

APPENDICIES

APPENDIX 1: National Consultees

Coed Cymru

Country Landowners and Businesses Association

Countryside Council for Wales

Eco Village Network UK

Farming Union of Wales

Federation of Low Impact Dwellers

National Farmers Union (Wales)

Permaculture Association

Royal Town Planning Institute (Wales)

Scottish Executive

Sustainable Communities Scotland

The Land Is Ours

Welsh National Assembly Government, Planning and Agriculture
Divisions

APPENDIX 2: What is Permaculture?

Permaculture is a way of designing sustainable systems for land use, housing, communities and businesses. The design process “*looks at the whole system and seeks to integrate the effective working of all its components whilst minimising external inputs and closing the cycles of resource use*” (Permaculture Association UK, 2001). It differs from many other approaches to resource use in that it does not focus on one main ‘yield’ (service, product or other benefit). Rather, it looks holistically at the *multitude* of possible yields and outcomes that result if resources are used in ways that create synergy through mutually beneficial relationships.

Permaculture design is an evidence-based approach to planning for sustainability. It has been developed from extensive observation of natural, self-regulating systems which evolution has shaped to perform both efficiently and interdependently. Permaculture has identified key attributes of these systems and aims to mimic these in its designs. These are called *Permaculture principles*. They provide a framework for approaching *various* aspects of sustainability, whereas organic gardening / farming comprises a set of *techniques* that are applied for a specific purpose i.e. food growing. These techniques may be incorporated into a Permaculture design but they do not constitute Permaculture in themselves.

In addition to these, three main *ethics* underpin Permaculture (after Mollison, 1990):

- *Care of the Earth* - provision for all life systems to continue and multiply.
- *Care of People* - provision for people to access those resources necessary to their existence (such as food, shelter, education and human contact, as well as fulfilling work and creative expression).
- *Setting Limits to Population and Consumption* - governing human needs so that resources can be set aside to further the other two ethics.

Permaculture suggests that paying attention to these ethics enhances the potential for success and helps to ensure that vital factors are not omitted. Moreover, the way in which the Permaculture principles are applied depends on *local* conditions, knowledge and culture, with designs tailored to local circumstances and subject to change in the light of experience. As such, the techniques employed vary with climate, geology, personal skills and resources and other variables. This flexibility allows Permaculture to be responsive to changing conditions and situations throughout the world.

The Permaculture principles

The Permaculture principles are as follows:

Create small scale systems

Using as little land as possible to meet human needs favours observation and experimentation, and helps a design to evolve flexibly and dynamically in response to new information, ideas and resources. It also means that any land employed is used efficiently and thoroughly - for example, techniques such as simultaneously planting herbaceous, bush and tree crops (all stages in a natural succession) help to maximise the total yield. This principle can also be applied on a larger scale, but *always* by the stepwise implementation *and completion* of smaller 'sub' plans that form part of a larger design for the whole site. Otherwise, it is easy to make the mistake of spreading out too quickly, wasting time, energy and other resources and losing control of certain aspects (Mollison, 1991).

Design for energy efficiency

a) Zones

Zoning is a very important concept in Permaculture. It means organising the layout of a design so that those areas or components requiring most frequent maintenance are closest to the centre of human activity. The zones continue outwards so that less intensive activities occur further away.

SOME FACTORS WHICH CHANGE IN ZONE PLANNING AS DISTANCE INCREASES.

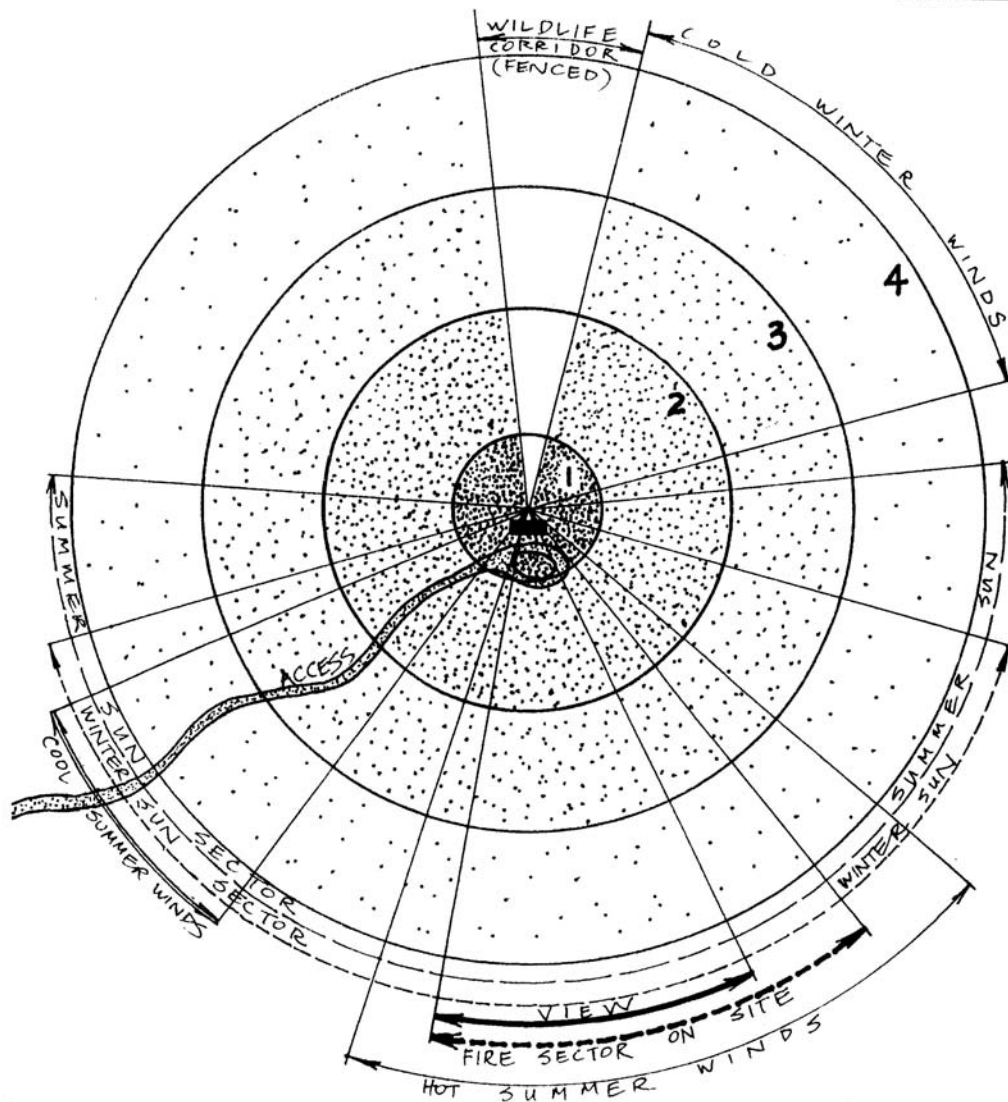
Factor or Strategy	ZONE I	ZONE II	ZONE III	ZONE IV
Main design for:	House climate, domestic sufficiency.	Small domestic stock & orchard.	Main crop forage, stored.	Gathering, forage, forestry, pasture.
Establishment of plants	Complete sheet mulch.	Spot mulch and tree guards.	Soil conditioning and green mulch.	Soil conditioning only.
Pruning and trees	Intensive cup or espallier trellis.	Pyramid and built trellis.	Unpruned and natural trellis.	Seedlings, thinned to selected varieties.
Selection of trees	Selected dwarf or multi-graft.	Grafted varieties and plants managed.	Selected seedlings for later grafts. by browse.	Thinned to selected varieties, or
Water provision	Rainwater tanks, bores wind pumps. reticulation.	Earth tank and wells, bores,	Water storage fire control.	Dams, rivers, in soils, dams.
Structures	House/greenhouse, storage integration.	Greenhouse and barns, poultry sheds.	Feed store, field shelter.	Field shelter grown as hedgerow and woodlot
Information	Stored or generated by people.	In part affected by other species.	As for II.	Arising from natural processes.

(Mollison 1990)

b) Sectors

Sectors refer to the natural energies and inputs that influence a site - sun, wind and water - and are usually directional in nature (e.g. prevailing winds, water flows, sun-shade patterns). Observing and taking account of sectors in a design enables one to mitigate against the major constraints caused by them. For example, optimising wind protection and exposure to solar gain might be important considerations, as well as mitigating against occasional but regular extreme events such as flooding.

Sectors



SECTOR ANALYSIS.

(Mollison 1990)

c) Slope

Sloping sites present particular opportunities and challenges. Aspect influences exposure to the sun and slope affects the movement of water, air and, potentially, soil. All of these are taken into consideration in order to create designs that will make the most of the advantages and minimise deleterious effects.

Put the 'right' things in the 'right' places

This means thinking about which things go best together and where. The aim is to foster beneficial, synergistic relationships that produce a variety of useful outputs. Examples include siting a hedge or shelterbelt to create a windbreak and other benefits but not unduly shade adjacent crops; planting beneficial plants near to crops to encourage pollinators and predators; collecting rain or grey water close to and/or up slope from the areas of use.

Provide several ways to support important functions

This means ensuring that major needs, such as wind protection and food production, are met in a variety of ways to spread the risk. So a windy site might be ameliorated by having a variety of appropriately sited shelterbelt, hedge and woodland plantings whilst also selecting more traditional, hardy varieties or breeds of plants and animals in adjacent areas. Similarly, providing shelter and food plants for a range of pollinating insects throughout their life cycles will assist them in undertaking the vital role of pollination for fruit and other crops.

Make things multipurpose

Enormous 'value addition' occurs if the main constituents of a design perform several different functions. A hedge can provide a windbreak, visual screen, wild food (and derived products), wildlife habitat, shade, stock barrier, shelter, wood products, and an aesthetic feature. A compost heap can provide heat for young seedlings or tender plants grown above it, a hibernation and/or breeding site for reptiles, a use for scrap wood (for the frame), a way of reducing land fill as well as producing compost. Chickens can supply eggs, meat, feathers, pest control, fertiliser, biofuel, heat and can prepare ground for crops.

Use biological resources

Permaculture designs aim to minimise the number of non-renewable resources needed to create and sustain them by favouring biological solutions over mechanical or (as a last resort) chemical methods. They use biological agents to undertake processes such as pest control and sewage treatment and local, natural materials such as wood, straw, reed, turf and willow to create structures. No/reduced tillage systems and permanent, perennial plantings are encouraged. These help to create a healthy soil, reduce run off and erosion, encourage biodiversity, increase carbon sequestration and provide flood protection.

Recycle energy and other resources

Permaculture aims to design cyclic systems to reduce the net loss of resources from a locality. Surplus plant materials can be used to produce mulch (minimising the need for weeding and watering), compost, worms, leaf mould (for soil conditioning and potting compost), wildlife habitat, art and crafts, textiles, paper, dead hedging (for wind and/or stock protection). Recovered heat can be used to warm water, provide frost protection, dry food crops, germinate seeds etc. Grey water can be re-used for flushing toilets, irrigation and 'feeding' a willow or reed bed. Local economic cycling is encouraged through LETS (local economic trading systems), farmers markets, community supported agriculture (in which farmers work directly with their consumers to guarantee markets, reduce risk, ease cashflow, cut waste and reduce marketing costs), credit unions and other local trading. All of these help to optimise the proportion of resources and currency staying in, and serving the needs of, the local community.

Plan for polycultures

A diverse, polycultural system is more robust than a monoculture. If a species or variety doesn't thrive, its absence will have less impact in a very diverse system. Different plants can benefit each other by occupying complementary aerial and root spaces, fixing nitrogen, bringing valuable minerals to the surface and attracting pollinators and beneficial predators. Polycultures of plants attract a diversity of wildlife and are less prone to decimation by pests. In human communities, a variety of skills, resources and services promote local exchange, synergy and greater resilience to external forces.

Incorporate edges

In nature, transition zones or 'edges' are where one habitat, climate, soil, slope or other variable meets another. Such edges are usually very productive since the changing environmental conditions provide niches for a great variety of species. Incorporating more edge in a design helps to encourage such diversity - woodlands and ponds, for example, can be designed and managed to have lots of edge in relation to their area whilst paying attention to their viability as habitats.

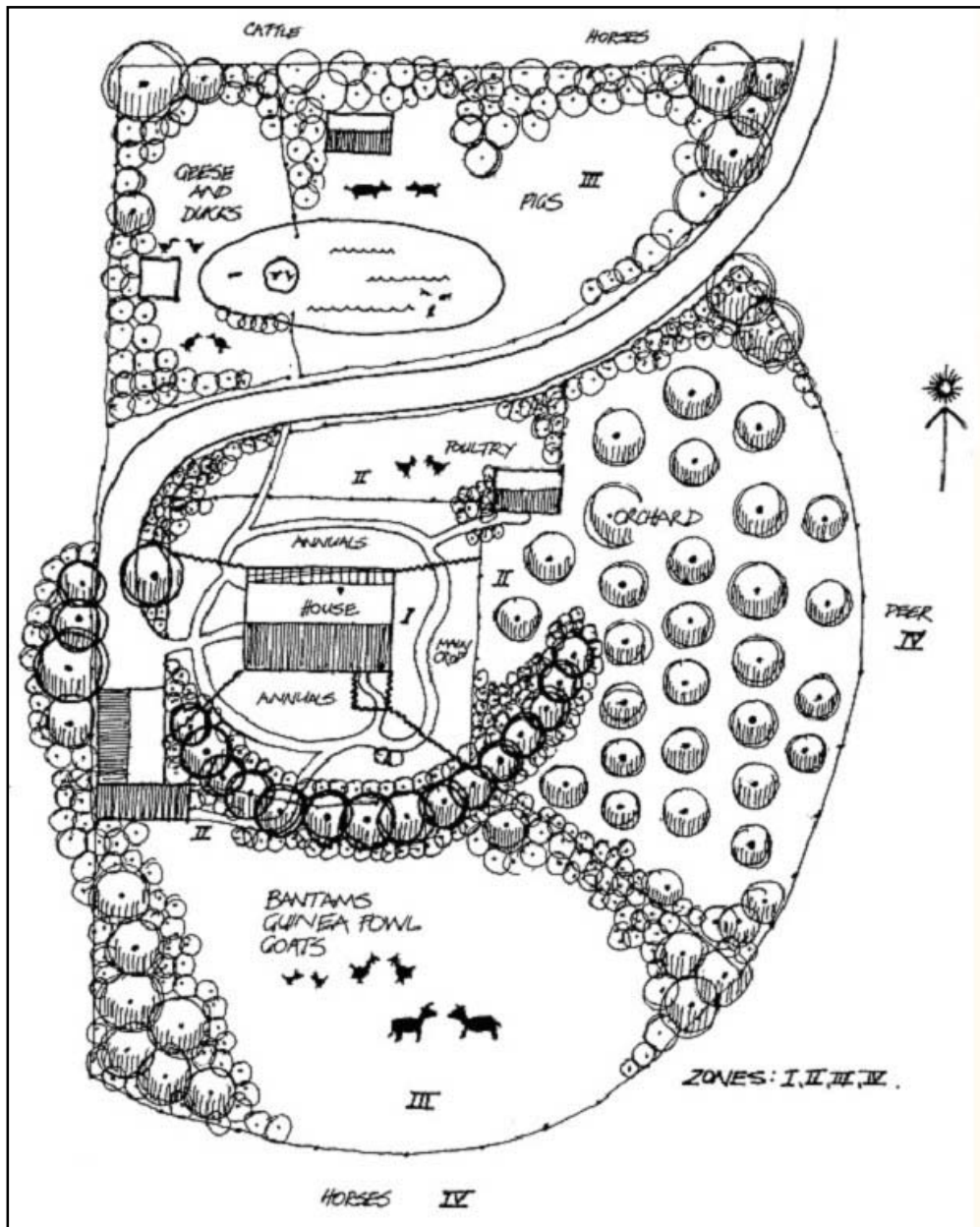
Create space for wildlife

Permaculture systems are designed to be more sustainable and biodiverse. By utilising the minimum amount of land for human needs it becomes much easier to allow space especially for wildlife. This means setting aside areas where there is less, perhaps no, human disturbance and where any inputs are particularly geared towards enhancing and maintaining biodiversity. Even in an urban situation, mini habitats, breeding/roosting boxes, feeders and windowsill planters with flowering herbs can all create useful 'service stations' for wildlife.

Turn problems into solutions

Successful Permaculture depends on creativity and innovation. As such it aims to foster a synergistic blend of information, personal observations and imaginative constructs, and avoid or reduce dependency on non-renewable energy and materials. Every feature of a site can be viewed as an advantage or disadvantage. With careful observation, the benefits or yields can be increased whilst minimising any perceived disadvantages and non-renewable inputs.

Thus Permaculture involves the development of subtle and complex system, seeking the most sustainable utilisation of a site's resources. Permaculture designs usually place a house at their centre as practitioners normally live on their sites to allow the close attention to detail and continuity of involvement necessary to implement highly productive, sustainable systems. The dwelling is an integrated component of the site design, though the principles of Permaculture can be applied in a wide variety of situations.



Examples of Permaculture from the UK

There is a growing number of farms and other rural businesses in England and Wales that are following Permaculture principles in aspects of their operations. These include:

- *Primrose Organic Centre* in Powys is a permaculture market garden holding with a £17,000 turnover from only 1.5 acres. All of the produce is sold within 15 miles radius and most within 5 miles. The Centre also offers an educational programme for local schools, training courses in sustainable production, community events and volunteer opportunities (Benham, 2001).
- *Bendall's Permaculture Farm* (40 acres) in Somerset is a mixed farming enterprise which has set itself some very challenging economic, environmental and social targets. These include meeting all of the nutritional needs of its

animals from within the site, increasing the number of people who make their livelihoods from the farm, therapeutic opportunities for people with learning difficulties, training courses and carbon neutrality. The farm aims to be a working model of sustainable development with trees and agroforestry at its heart. (Permaculture Works, Autumn 2000).

- *Little Ash Eco-Farm* in Devon uses the hardy local breed of South Devon cattle for grazing and its own manures and composts to feed the land. Energy is supplied from wind, solar power and wood, with hedges and woodland managed to produce biomass. Rainwater is harvested and used water is recycled. Clusters of small business workshops provide facilities for a leather worker, woodsman and rustic furniture maker, basket and reed worker, spinners, weavers and knitters. An organic box scheme and farm shop serve the local community (Littlewood, 2001).
- *Tablehurst Farm* in Sussex is owned and managed by the local community along with 'appointed' farmers and interested outside partners. Working together with another local farm, it sells organic meat, vegetables and dairy produce year round. The resident community of fifteen includes three adults with learning difficulties who work on the farm whilst developing their own confidence and skills. The farm also forms a thriving part of the local village which has a large variety of shops and small businesses providing different trades and skills (Littlewood, 2001).
- *Westons* cider mill in Herefordshire has implemented a multifunctional 'Wetland Ecosystem Treatment' (WET) which incorporates existing features of the site into a complex of lagoons, ponds and banks planted with various tree species. These convert the mill's waste process water, which has a high organic loading and is extremely acidic during the cider making season, into a wide variety of plant products such as short rotation willow coppice for basketry and fuel, coppice products from other tree species and extensive wildlife habitat. A conventional system would have required expensive holding tanks, chemical treatment, a large power supply to mix and aerate wastes and high running and maintenance costs. The WET system provides myriad benefits, with management largely in the form of harvesting yields. An outlet has also been found for the fermentation lees (which could create an odour problem in the WET system) as a high protein pig food. (Abrahams, 1996).
- *Bruce Marshall*, a Scottish farmer, has employed the biological services of clover and earthworms to improve an acid, boggy hill farm in the Pentland Hills. Rather than draining, ploughing, reseeding, liming and applying artificial fertiliser, he made a one-off application of rock phosphate and lime before broadcasting clover seed and introducing earthworms from elsewhere in the valley. The clover provides nitrogen and the worms keep the acidity down and improve soil structure. A modest initial capital cost has enabled output to be more than doubled with no further inputs (Whitefield, 1993).

APPENDIX 3: Tinker's Bubble Legal Agreement

Tinker's Bubble Management Plan 1999 - 2004

March 1999

- **Part A - I. General Information - II. Environmental Information - III. Detailed Description by Compartment**
- **Part B - IV. Evaluation of Features**
- **Part C - V. Aims and Objectives**

Part A

I. General Information

I.1 Grid Reference ST 486158

I.2 County Somerset

I.3 District South Somerset

I.4 Parish Norton sub Hamdon

I.5 Situation The site occupies the south facing slope of Ham Hill. It is reached from a narrow unclassified road eastwards from the hamlet of Little Norton.

I.6 Site Area Approximately 40 acres (16 hectares).

I.7 Primary Features Woodland, hedges, orchards, pasture, streams/springheads. Public Footpaths. Experimental residential settlement.

I.8 Tenure The land is being transferred to the freehold ownership of a co-operative entitled Tinker's Bubble Land Ltd.

I.9 Compartments For management purposes the site is divided into six compartments (Map 2). The boundaries and hedges will be dealt with separately. Compartments 1 and 5 consist of 14 acres of orchard and pasture, while the other four compartments contain 26 acres of woodland. The residential settlement is in compartment 2.

I.10 Past management It appears that throughout much of its history the Northern slopes of this site were managed as woodland and despite the presence of exotic species, such as Douglas Fir, some ancient woodland indicator species still survive. The condition of many of the Ash and Hazel trees suggest that they were previously coppiced and some of the stools are very large, indicating a long history of coppicing. The Douglas Fir and much of the Larch was planted for commercial timber production by Economic Forestry Ltd in about 1960.

A few meadow species are present in the orchard and pasture areas, indicating that these areas have probably been clear of woodland for some time and managed either by grazing or regular mowing. The westernmost orchard in compartment 1 was known within living memory as Òhemp closeÓ. The terraces in compartment 1 were

created some 50 years ago and originally planted with cherry trees. Many of the hedges are mature or derelict and may have been managed by laying in the past.

II. Environmental Information

II.1 Geology Ham Hill stone over Yeovil sands.

II.2 Soils Fine and clays, base rich, easily eroded when exposed to heavy rains. Peaty acidic soils where waterlogging occurs over clays.

II.3 Biological summary Part of the site is a County Wildlife Site as designated by the Somerset Wildlife Trust. The site contains a mixture of habitat and plant communities from mixed broadleaf woodland to monoculture conifer plantation, hazel coppice, embanked hedgerows, aquatic habitats and grassland. The site provides a habitat for deer, badger, fox, buzzards, goldcrests, green woodpeckers, grasssnakes and other species.

The Ancient Woodland Inventory identifies part of the wood as ancient semi-natural. Ancient woodland indicators include moschatel, field maple, pendulous sedge, holly, bluebell, town hall clock and dogs mercury. Other notable species include wych elm and scaly male fern.

II.4 Sources of data

- Somerset Environmental Record Centre (visit 1990);
- a 1994 visit and draft plan prepared by H. Baschkovska of the Hants Wildlife Trust;
- a report by Wessex Environmental Assessment (1994);
- a woodland report by D. Wood (1994);
- Tinker's Bubble Forestry Plan;
- a biological survey carried out by T Bell and C Cornell (1995).

II.5 Archaeology The 1839 Tithe maps show two areas of ancient coppice, suggesting that the main central area of the wood, just north of the east west public footpath may not be of ancient origin.

There are no known archaeological earthworks but there are two dry ditches and banks in compartment 2 of unknown origin, possibly former boundary banks. The pond in compartment 6 was associated with the local flax industry.

Ancient monument No 106 Ham Hill lies to the north and its boundary just touches the north east corner of compartment 4.

II.6 Landscape The site lies in a designated Special Landscape Area (Yeovil Area Local Plan) and in Region 4 (Ham Hill Plateau, Yeovil Sands Escarpments and Valleys and in particular character Zone 3 (Ham Hill Stone Hills and Valleys) of 'the Landscape of South Somerset' 1993.

The area is part of a much larger region of considerable character and interest, centred on Ham Hill plateau. It consists of wooded escarpments and valley slopes, semi-improved sheep/cattle grazed permanent pasture, hazel and ash coppice hedges, lanes, holloways and orchards.

II.7 Ecological siting Norton Covert and its associated orchards are part of a greater ecological unit in association with the Ham Hill Country Park which now includes Witcombe Valley. It is very likely that the larger mammals and avian predators take advantage of Norton Covert along with neighbouring woodland. The wooded lanes, holloways and streams interconnect the nearby woodlands. The spring in the wood feeds a tributary of the Parrett catchment. The stream joins the river Parrett just below Creedy Bridge.

III. Detailed Description by Compartment

III.1 Compartment 1 9.1 acres. This consists of: 3 acres of Bramley semi-standard orchards, 1.5 acres of dwarf eating-apples (mainly coxes), 3 acres of pasture and 1.5 acres of brambles shielding regenerating oak and ash. In 1998 1.5 acres of dwarf eating-apples were removed to be replaced in the year 2000/2001 with standard traditional apple varieties.

The southern boundary of the orchards abuts a RUPP and there is a small car park in the middle of this boundary. Near to the car park a barn is being constructed which will serve to house a sawmill and as an apple and vegetable packing shed.

The boundary hedges are mature coppice hazel, elm, hawthorn, cherry etc. and are very gappy. On the Western edge the hedge is overshadowed by the woodland. The eastern boundary is a poplar windbreak. A new hedge, with a variety of species has been planted in front of the car park.

III.2 Compartment 2 7 acres. This is part of Norton Covert and consists of 90 per cent Douglas Fir with a fringe of broadleaves including some quite large hornbeam and ash. The understorey, comprising a few hazel stools and laurel stands is poor where the Douglas remains unthinned. An area adjacent to the stream has been cleared of laurel and has been planted with mixed deciduous trees, as well as exhibiting naturally regenerating ash and sycamore.

There are two substantial banks and dry ditches running east west. The settlement is located at the eastern end in between these ditches. There is an abandoned underground reservoir near the south west corner.

III.3 Compartment 3 8 acres. This comprises the remaining area of Douglas Fir with remnants of broadleaved woodland, ash coppices and a hornbeam grove in the south eastern corner. In the vicinity of a large stone pine there is a large area of naturalized snowdrops. Apart from this, under the Douglas the herb-layer and understorey is virtually non-existent.

The southern boundary is the east-west footpath, a popular route to Ham Hill Country Park. The northern and eastern boundaries with the country park are not delineated by any fence, but a number of large ash coppices and a large beech tree may have served as boundary markers.

III.4 Compartment 4 5.5 acres. This area was planted with larch around 1960. The larch have not been thinned and a number are falling or leaning. The shade of the larch is less dense than the Douglas and more sympathetic to the understorey which is dominated by ferns and dog's mercury. There is a greater proportion of ash than in compartments 2 and 3 and there are about 100 large hazel stools scattered unevenly around the area. An area of approximately 0.5 acres has been felled, in accordance

with the previous management plan and replanted with ash, sweet chestnut, cherry and larch.

The Southern boundary is the east/west ride; the western boundary bordering the country park is marked by a strip of hazel coppice; Northern boundary with the country park is delineated by an overgrown and gappy hawthorn hedge, starved of light by the trees, but there is no fence.

III.5 Compartment 5 4.7 acres. This is a mature orchard of cox and russet semi-standards. An old name for this field was 'shipway' or 'sheepway'. The coxes are some 40 years old and yield nothing while the russets are probably younger and yield intermittently. All the trees are diseased and cankered. The field has been fenced and is grazed by a horse and sheep. About one quarter of an acre in the north eastern corner is cultivated, and there is a field shelter in this corner. Another half acre in the south western corner is being cleared for cultivation.

The northern and eastern boundaries abut the woodland and contain hazel, holly and other smaller trees; the western boundary is overgrown banked hazel; the hedge along the southern boundary has been cut back and replanted, primarily with hawthorn.

III.6 Compartment 6 6 acres. This compartment contains mixed broadleaf (ash, sycamore, alder, willow, hazel, oak etc.) and conifer (Douglas Fir and Yew). Much of the deciduous wood is tall and whippy. Nearly two acres have been fiercely invaded by cherry laurel, though some of this has been cleared.

Aquatic features include the springhead, a boggy area around it, the stream, and the small waterfall onto the road. The marshy area harbours aquatic flora including hemlock, water dropwort, opposite leaved golden saxifrage and greater horsetail. There is a small pond near the road fed by a diversion from the stream. Over the last few years laurel and sycamore have been cleared from around the stream to let in more light.

Part B

IV Evaluation of Features

IV.1 Size This is a small wood by national standards but of considerable importance in the context of South Somerset, where woodland cover, at 4.1 per cent, is considerably below the national average of 7.4 per cent (one of the lowest levels in Europe.)

IV.2 Diversity The site is quite diverse with three different types of woodland, the most significant being the mixed woodland in compartments 4 and 6. Here the original semi-natural woodland has been diversified by the addition of exotic and naturalized trees such as sycamore and larch. The streams and associated wetlands add further to the diversity. The orchards and grasslands, although highly managed, also add to the diversity. The hedgerow habitats are also important.

IV.3 Naturalness The site is not particularly natural. the original semi-natural wood is only recognizable in parts where the coppice remains and the flora is undisturbed. Most of the woodland has been extensively replanted with exotic firs. There are few really old trees and most of these are multi-stemmed coppice. The hedges are perhaps the most semi-natural features of the site.

IV.4 Rarity There are a number of county notable species of plant and animal (see SERCs report and Bell and Cornell's biological survey).

IV.5 Fragility The main fragility of the site relates to the aquatic habitats. The wetland plant communities associated with the stream are vulnerable to trampling. The ancient woodland flora that survives in some parts of the covert is very vulnerable to indiscriminate trampling or destruction during woodland management and may be very marginal where the shade of the conifers continues to increase. Windthrow of trees exposed by woodland management may be a problem. The steep slopes, the nature of the soils and heavy winter rainfall, causing soil erosion, silting of the stream and pond are factors to be considered. Human settlement can cause problems of eutrophication unless measures are taken to deal with sewage, waste food etc.

IV.6 Typicalness The surviving flora is typical of such woodlands in the area. A unique aspect is the settlement and the effort to manage the wood in a sustainable manner whilst living within it.

IV.7 Ecological Position Norton Covert is not isolated from surrounding habitats. The generally low-input, low-output and marginal nature of farming in the area, and the difficult terrain have led to the survival of a large number of habitats and plant communities of much quality in nature conservation terms. Norton Covert lies at the centre of 13 County Wildlife Sites, all within 2 kilometres. These sites are linked by a mosaic of green lanes holloways and hedgerows. This area is therefore of great interest and the loss or damage of any one area is to the detriment of their neighbouring sites, especially given the intensive low-land farming taking place to the west.

IV.8 Potential Value The site has great potential for enhancement of nature conservation and landscape value which should in turn increase its recreational appeal. The timber value of the Douglas Fir and to a lesser extent of the larch, is also very high if it is extracted and marketed appropriately.

IV.9 Intrinsic Appeal The site has appeal to specialist and non-specialist alike. The high accessibility and footpath links to Ham Hill and Witcombe Valley all add to the appeal and enjoyment of the woodland.

Part C

V. Aims and Objectives

V.1 Aims The aims of the management plan are:

A. TO MAINTAIN AND ENHANCE THE HABITATS AND SPECIES DIVERSITY.

B. TO MAINTAIN AND ENHANCE THE LANDSCAPE QUALITY.

C. TO FACILITATE THE PROVISION OF LIVELIHOODS AND AN INCREASE IN PRODUCTIVITY, WITHOUT PREJUDICE TO AIMS A AND B.

D. TO HAVE REGARD FOR ALL LEGAL OBLIGATIONS AND OTHER RESPONSIBILITIES.

These aims are translated into the following operational objectives:

V.2 Woodland To conserve and enhance the woodland to retain its wildlife and landscape value by traditional and sustainable forms of management, whilst realizing a sustainable income from the timber. The area will be managed under a system of group selection, whereby trees will be planted and felled in groups, providing an element of continuous cover. The eventual aim will be mixed woodland with different age classes.

V.3. Hedges To conserve and enhance the hedgerows and hedgerow trees to ensure they retain wildlife value and continue as important landscape features.

V.4 Orchards To improve the orchards by gradually replacing the present stock with traditional standard varieties propitious for organic cultivation and increasing the diversity of varieties and species.

V.5. Grassland To conserve and enhance the quality of the meadowland through rotated grazing of organically maintained livestock and hay making.

V.6. Aquatic Habitats To conserve and enhance the spring, stream, marsh area and pond and to ensure they retain wildlife and recreational value through a policy of minimum intervention.

V.7. Species To safeguard all notable species of flora and fauna.

V.8. Landscape To cause minimal adverse impact upon the landscape.

V.9.. Global impact To carry out agricultural, forestry and other land management activities with due regard for global environmental impacts and for sustainable development as defined in the Rio Declaration.

V.10. Lifestyle To carry out all domestic activities in a way which minimizes impact on the environment.

V.11. Public Access To facilitate public access and enjoyment of the site, whilst protecting that which is enjoyed.

V.12. Legal obligations To have proper regard for legal and other obligations and responsibilities.

V.13 Review procedure. The management plan for the site will be regularly reviewed.

The objectives are specifically outlined below:

V.2 Woodland

Operational Objective: Toconserve and enhance the woodland to retain its wildlife and landscape value by traditional and sustainable forms of management, whilst realizing a sustainable income from the timber. The area will be managed under a system of group selection, whereby trees will be planted and felled in groups, providing an element of continuous cover. The eventual aim will be mixed woodland with different age classes.

The woodland is to be gradually returned, through a felling regime based on group selection, to a 50 per cent broadleaved coppice with standards structure typical of English lowlands and 50 per cent unregimented conifer plantations. Glades and rides will be incorporated to improve the structural diversity of the wood. Compartment: 2,3,4,6 Priority: High Timescale: Continuous

The coniferous plantations will be managed in accordance with the principles and criteria of the Forestry Stewardship Council. Accreditation with the FSC will be sought when this is economically feasible. Compartment: 2,3,4,6 Priority: Medium Timescale: Continuous

Where possible, dead wood both standing and lying will be retained. Compartment: 2,3,4,6 Priority: High Timescale: Continuous

Nest boxes and bat-boxes will be provided throughout the wood constructed from home-grown timber. Compartment: 2,3,4,6 Priority: Low Timescale: Continuous

Brash left over from management will be piled up and left to rot. Compartment: 2,3,4,6 Priority: Medium Timescale: Continuous

Ivy will be retained on trees unless this is so overwhelming that it may cause structural damage to the tree. Compartment: 2,3,4,6 Priority: Low Timescale: Continuous

Small irregular shaped glades of approximately 30 metres will be cleared around selected ash trees within the conifer plantations to allow them to reach maturity and to encourage natural regeneration. Compartment: 2,3,4,6 Priority: High Timescale: Years 1,2 and 3

The clearing on top of the knoll should be felled gradually to avoid windblow and a band of trees should be retained to the East. Compartment : 2 Priority: High Timescale: Years 1 and 2

Planted trees and where appropriate naturally regenerating seedlings must be protected from browsing animals; newly planted trees should be kept weed free and watered during extremely dry periods. Compartment: 2,3,4,6 Priority: Medium Timescale: Continuous

The tree nursery established in compartment will be stocked with seedlings taken from Norton Covert and other local sources. Compartment: 5 Priority: High Timescale: Continuous

All trees planted must be of local provenance if possible. Compartment: 2,3,4,6 Priority: High Timescale: Continuous

The planting of stands of non-native species will be confined to the conifer plantations, except by agreement with the District Council. Compartment: 2,3,4,6 Priority: High Timescale: Continuous

The Douglas Fir will be thinned at a rate consistent with sustainable and even growth of the woodland and with sustained and regular operation of the sawmill. The edges of the wood will be thinned with caution so as to preserve a windbreak. Compartment: 2,3 Priority: High Timescale: Continuous

The stands of hornbeam require only minimal management. Compartment: 2,3
Priority: Low Timescale: Continuous

The larch will be gradually felled in small coupes sufficiently large to accommodate replanting as and when it is required for the sawmill. The hazel within each coupe will be coppiced simultaneously and a number of good specimen standard trees will be retained at the rate of 11 to the acre. Each coupe will be replanted with deciduous trees the same or the following winter. About 20 per cent of the larch -namely that sited along the southern and western borders and in the north west corner around the badgers setts -will be retained to provide shelter and a nesting place for buzzards and other birds. Compartment: 4 Priority: High Timescale: Continuous

The better specimens of larch, Douglas fir, ash, oak beech and sycamore will be retained as standards. Lower quality sycamore will be coppiced every eight to ten years to prevent it seeding; Lower quality ash will be coppiced so as to produce timber both for the sawmill and for coppice craft work. Hazel and alder will also be coppiced. Compartment: 6 Priority: High Timescale: Continuous

The laurel will continue to be felled and where appropriate, tree planting will take place. The arch of laurel at the junction of the two public footpaths will be retained as a feature for the time being. Thereafter small amounts of laurel will be maintained at a height of no more than five feet so as to afford cover and intimacy within the woodland. Compartment: 2,3,4,6 Priority: High Timescale: Years 1-4 and then continuous

The widening of the east/west ride will be completed. Compartment: 2,3,4,6 Priority: High Timescale: Year 1

Heavy timber will be extracted by horse. Compartment: 2,3,4,6 Priority: High
Timescale: Continuous

V.3 Hedges

Operational Objective: To conserve and enhance the hedgerows and hedgerow trees to ensure they retain wildlife value and continue as important landscape features.

Existing hedges will be coppiced/laid/gapped up as appropriate. Compartment: 1,5,6
Priority: High Timescale: Years 2 and 4

A meeting will be arranged with the Country Park to discuss in greater detail the problems relating to public access, tenure, lack of light and animal damage as regards the hedging of this boundary. Compartment: 2,3,4 Priority: High Timescale: Year 1

A review will be made of the new stockfences erected by the Trust across these compartments, to predict their permanent value and to assess whether any might form the line of a new hedge. Compartment: 1,5 Priority: High Timescale: Year 3

All hedgerow work will be confined to the winter months November till March.
Compartment: All Priority: Medium Timescale: Continuous

Stockplants for hedgerow replanting will be of UK origin and as far as possible from local stock. Compartment: All Priority: High Timescale: Continuous

V.4. Orchards

Operational Objective: To improve the orchards by gradually replacing the present stock with traditional standard varieties propitious for organic cultivation.

The dwarf eating apples will be intercropped and retained or removed as appropriate.

Compartment: 1 Priority: High Timescale: Continuous

The Bramley orchards will be grazed by sheep or cows and if necessary scythed. In an experimental area every other tree will be removed to see if this improves productivity and ease of maintenance. Compartment: 1 Priority: High Timescale: Continuous

The south east corner "bottom square" will be replanted with traditional standard varieties of eating and cider apples and possibly other fruit. The trees will be protected from animals and planted at a density consistent with a grazing/haymaking regime.

Compartment: 1 Priority: High Timescale: Years 2 to 4

The aged coxes in this compartment will be removed. Compartment: 5 Priority: High Timescale: Years 1 and 2

The russets will be kept to assess their performance; and a decision whether or not to remove them will be made after year 3's crop. Compartment: 5 Priority: Medium Timescale: Year 2

Standard apple and possibly other fruit trees will be planted in selected parts of the compartment consistent with continued grazing by the horse and sheep/cows.

Compartment: 5 Priority: Medium Timescale: Years 4-5

The orchards will be managed organically and Soil Association accreditation for the apples will be retained. Compartment: 1 and 5 Priority: High Timescale: Continuous

V.5. Grassland

Operational Objective: to conserve and enhance the quality of the meadowland through rotated grazing of organically maintained livestock and haymaking.

All livestock for meat or dairy will be managed and fed organically and Soil Association accreditation will be applied for. Compartment: 1 and 5 Priority: High Timescale: Continuous

Grazing will be carried out in rotation, so far as possible to give each unit a rest of at least three months between separate grazings by any particular animal. Sheep, goats or cows will follow the horse. Compartment: 1 and 5 Priority: High Timescale: Continuous

All areas of grass to be chain harrowed at the end of winter. Compartment: 1 and 5 Priority: High Timescale: Continuous

Invasive bracken will be removed by hand and used as thatching for garden sheds, compost heaps, plastic barrels etc. so as to diminish the visual impact of the horticultural paraphernalia. Compartment: 1 and 5 Priority: Medium Timescale: Continuous

Ragwort and invasive thistles will be pulled by hand before they go to seed and dead plants removed. Compartment: 1 and 5 Priority: High Timescale: Continuous

The bottom square will be grazed in winter and early Spring then left for hay. Hay will be made late, in July or August depending on the weather, to allow plants to flower. Flowering dock, thistles and ragwort will be removed by hand prior to haymaking. Compartment: 1 Priority: High Timescale: Continuous

The field at the north east corner (south facing slope) will not be grazed between May 1 and July 15 . A corner of this field, presently outside the fence, will be left as rough grass and only occasionally grazed by a tethered goat or similar. Compartment: 1 Priority: Medium Timescale: Continuous

At least four of the oak trees in the south facing slope and bottom square will be retained and fenced off from grazing animals if necessary. Compartment: 1 Priority: High Timescale: Year 1

An area beneath the south facing slope has been reserved for an experimental forest garden. Compartment: 1 Priority: Medium Timescale: Continuous

The acre to the west of the south facing slope, presently overgrown with brambles and regenerating oak, ash and cherry will remain a minimum intervention zone. Any management will protect or enhance tree growth. Compartment: 1 Priority: Medium Timescale: Continuous

Greater efforts will be made to reverse the severe invasion of this pasture by stinging nettles, docks and creeping buttercup. Measures may include: removing the derelict apple trees; drag harrowing the nettles; topping docks and nettles more frequently with a horse drawn implement; fencing for goats; rooting up the worse areas with pigs and resowing; liming. Compartment: 5 Priority: High Timescale: Years 1-3 and Continuous

Renewed efforts will be made to secure additional pasture nearby for the horse Compartment: 1 and 5 Priority: High Timescale: Years 1 to 2

V.6. Aquatic Habitats

Operational Objective: To conserve and enhance the spring, stream, marsh area and pond and to ensure they retain wildlife and recreational value through a policy of minimal intervention.

The stream will be kept clear of debris and any pollution avoided. Compartment: 6 Priority: High Timescale: Continuous

Work in marshy areas will be kept to a minimum and restricted to dry spells. Care will be taken not to cause erosion of the stream banks or excessive trampling during any tree felling or extraction. Compartment: 6 Priority: High Timescale: Continuous

Opening up the stream to the light will precede cautiously so as to preclude undesirable weed growth.. Compartment: 6 Priority: Medium Timescale: Year 1 and 2

The bamboo stand to the west of the stream will be contained by regular cutting.
Compartment: 6 Priority: Low Timescale: Continuous

V.7. Species

Operational Objective: To safeguard all notable species of flora and fauna.

No work other than hazel coppicing and hedging to be carried out in the "badger zone" at the north west corner. All work to be carried out between 30 June and 1 December to avoid the breeding period, and advice will be sought from MAFF and the Somerset Wildlife Trust Badger Group. Compartment: 4 Priority: High
Timescale: Continuous

One member of the trust to be given responsibility for identifying rare or sensitive species of flora and fauna on the site, and for ensuring that other members are aware of these species and make provision for their protection. Compartment: 4 Priority: High
Timescale: Continuous

V.8. Landscape

Operational Objective: To cause minimal adverse impact upon the landscape.

All permanent or semi-permanent plastic agricultural paraphernalia visible from the road or the other side of the valley to be covered with vegetation or dull-covered matting. Compartment: 1,5 Priority: High Timescale: Continuous

All tarpaulin or canvas roofs to be replaced with timber, tile, thatch or earth within 3 years of erection. All corrugated iron roofs to be replaced by timber, tile, thatch or earth within five years of erection unless there are strong exceptional reasons for retaining corrugated iron. Compartment: 1,5 Priority: High Timescale: Year 5

All plastic, cardboard or carpet mulch to be covered with vegetation, earth or sawdust. Compartment: All Priority: High Timescale: Continuous

All future polytunnels to be sited as unobtrusively as practicable. When a polytunnel plastic needs to be replaced, the person responsible will be required to supply an environmental audit and cost benefit analysis comparing continued polytunnel use with replacement by a new or secondhand glasshouse. Compartment: 1,5 Priority: Medium Timescale: Continuous

No domestic structures to be erected or domestic development to occur in these compartments other than the car park and the generation of electricity. Compartment: 1,3,4,5,6 Priority: High Timescale: Continuous

All future agricultural structures to be clustered as far as practicable in one of the following zones: close to the barn, next to the greenhouse, next to the cider house, or next to the field shelter in compartment 5. Exceptions may include small discreet tool-sheds in gardens and a small field shelter serving the south facing slope and the bottom square. Compartment: 1 Priority: Medium Timescale: Continuous

V.9. Sustainable development issues

Operational Objective: Agricultural, forestry and other land management activities to be carried out with due regard for global environmental impacts and for sustainable development as defined in the Rio Declaration.

No fossil-fuel powered machinery or heating device to be used upon the land, except for delivery by motor vehicle to the car park, to the entrance of compartment 5, and exceptionally and by agreement with the Trust's management, to an appropriately sited muck heap. The Trust reserves the right to make exceptions to this policy by full consensus at a management meeting. Compartment: All Priority: High Timescale: Continuous

No more than three motor powered vehicles will be operated from the site.
Compartment: 1 Priority: High Timescale: Continuous

No sands or aggregates, other than Ham Hill stone-saw waste or recycled aggregates, to be employed without express permission of the Trust's management. Compartment: All Priority: Medium Timescale: Continuous

No industrially produced chemicals, such as creosotes, wood preservatives, pest poisons, chlorates etc. to be employed in contact with the land except those which are expressly permitted by the Soil Association, or which have been permitted for a specific purpose by the Trust's management. Compartment: All Priority: High Timescale: Continuous

No animal feeds or fertilizers imported from other countries to be used upon the land.
Compartment: All Priority: Medium Timescale: Continuous

No genetically modified produce to be used or consumed upon the land.
Compartment: All Priority: High Timescale: Continuous

V.10 Lifestyle

Operational Objective: To carry out all domestic activities in a way which minimizes impact on the environment.

Fire sites to be kept to a minimum and safely located away from combustible undergrowth or overhanging branches. Compartment: 2 Priority: High Timescale: Continuous

Firebeaters or Devon shovels will be kept close to water points at the top of the knoll, near the cider house and in compartment 5. Compartment: 1,2,5 Priority: High Timescale: Continuous

Ash from fires will be used as a crop fertilizer and can be stored dry before composting. Compartment: All Priority: High Timescale: Continuous

Latrines will be dug away from sensitive habitats and watercourses. Consideration will be given to improved forms of composting toilets. Compartment: 1,2 Priority: High Timescale: Continuous

Waste water will be dealt with in an environmentally sound way and not allowed to foul watercourses or cause eutrophication. Compartment: All Priority: High Timescale: Continuous

All waste materials that cannot be re-used will be recycled if the facilities exist. No plastic will be burned on site and the Trust's management may seek to ban the use of disposable plastics where a practicable alternative exists. Compartment: All Priority: High Timescale: Continuous

Dogs will not be allowed to range unattended at a risk to wildlife and livestock. Compartment: All Priority: High Timescale: Continuous

All readily degradable vegetable waste (other than diseased plants and noxious perennial weeds) and all animal manure will be composted for use on crops. Compartment: All Priority: High Timescale: Continuous

V.11. Public Access

Operational Objective: To facilitate public access and enjoyment of the site, whilst protecting that which is enjoyed.

The public rights of way will be maintained in a passable condition. Erosion on sloping paths will be stemmed by digging small gulleys to divert water run-off into the undergrowth. Compartment: 2,3,4,6 Priority: High Timescale: Continuous

The public are permitted to walk anywhere in the woods except in the stream and marshy areas. Since most members of the public do not want to get their feet wet it has not been felt necessary to put up notices to this effect. Compartment: 2,3,4,6 Priority: Medium Timescale: Continuous

Horses and mountain bikes will be permitted in the woods as long as they do not cause erosion or other problems. If such problems do occur, solutions will be sought after consultation with the Country Park. Compartment: 2,3,4,6 Priority: Medium Timescale: Continuous

The kissing gate on the public footpath at the south east end of compartment 4 was erected without our consent and obstructs the extraction of timber where we have extraction rights. A normal swing gate will be erected and the removal of the kissing gate will be requested. A swing gate will also be erected where the north/south public footpath meets the road at the south east corner of compartment 6. Compartment: 4,6 Priority: High Timescale: Year 1

V.12. Legal Obligations

Operational Objectives: To have proper regard for legal and other obligations and responsibilities.

All felling will be carried out in accordance with the Forestry Authority code of working practice. Compartment: 2,3,4,6 Priority: High Timescale: Continuous

All reasonable steps will be taken to ensure the safety of all who visit and work on the site. The Trust has an NFU insurance policy covering accident and injury to employees and the public. Compartment: All Priority: High Timescale: Continuous

Measures, listed in the Fire Safety Plan provided by the County Fire Safety Officer, will be taken to minimize the risk of fire to dwellings or woodland. Compartment: 2,3,4,6 Priority: High Timescale: Continuous

The Trust will endeavour to maintain good relations with neighbours and adjacent communities. Communications with the Trust may initially be addressed to the Secretary

V.13. Review Procedure

Operational Objective: The management plan for the site will be reviewed regularly.

All management procedures will be monitored for their effectiveness and modifications made to the plan as necessary. Such modifications can only be made by full consensus at a quorate management meeting of the Trust's members. Priority: High Timescale: Continuous

An annual report on the progress made implementing the plan will be written and delivered to South Somerset District Council. Priority: High Timescale: Years 1 to 5

APPENDIX 4

LOW IMPACT DEVELOPMENT - PLANNING POLICY AND PRACTICE

THE IMPLICATIONS OF THE HUMAN RIGHTS ACT 1998

I. INTRODUCTION

1. The main purpose of the Human Rights Act 1998, which came fully into force on 2 October 2000, is to make the European Convention on Human Rights a part of UK law, so that the rights which it contains are made more practical and effective through being more directly accessible to people living in this country.
2. In one sense, one would not expect the Convention to contain very much of relevance to Low Impact Development. In its origins, the Convention was a charter of primarily negative rights the purpose of which was to protect the individual against the overbearing power of the State. In the words of Stephen Sedley (now a Lord Justice sitting in the Court of Appeal of England and Wales), it mainly enshrines "the Enlightenment values of possessive individualism": precisely the values which are eschewed by Low Impact Development and the lifestyle associated with it.
3. The rights it guarantees are not primarily in the nature of social or economic rights, and values around which considerable international consensus is now emerging, such as sustainability, do not find a place in the Convention scheme. This inevitably means that there is a limit to the extent to which the Human Rights Act 1998 can fill the gaps left by the inadequacies of the current legal and policy framework of the planning system.

4. Nevertheless, there are some Convention rights which are relevant to Low Impact Development and the planning framework which governs it, and in recent years the case-law of the European Court of Human Rights has also increasingly recognised that Convention rights are not merely negative in nature, restraining the State from interfering with certain fundamentals, but may also impose positive obligations on the State, for example to take active steps to facilitate the enjoyment of a particular right. This trend in the development of the Convention case-law has rendered the Convention rights more relevant in areas, such as the environment, where previously it may have had little application.
5. The coming into force of the Human Rights Act 1998 ("the HRA 1998") on 2 October 2000 therefore has a number of implications for planning policy and practice concerning Low Impact Development. The following commentary considers, first, the relevant duties under the Human Rights Act which are now owed by all public authorities within the planning system; second, the most relevant Convention rights in this particular context; third, the approach which the Convention requires a planning authority to take before taking enforcement action against low impact development which has already taken place and continues to exist; and, fourth, whether policies which make special provision for Low Impact Development are discriminatory in a way which is impermissible under the Convention.

II. THE RELEVANT DUTIES UNDER THE ACT

6. The Human Rights Act imposes a number of duties on planning authorities which are relevant to their functions in relation to Low Impact Development. Local planning authorities and the Secretary of State are "public authorities" for the purposes of s. 6 HRA, and it is therefore unlawful for them to act in a way which is incompatible

with a Convention right (s. 6(1)), unless mandated to do so by legislation which cannot itself be read compatibly with Convention rights (s. 6(2)).

7. Section 3(1) HRA also requires all legislation to be read and given effect in a way which is compatible with Convention rights, "so far as it is possible to do so". All statutory provisions which empower planning authorities in ways which are relevant to Low Impact Development must therefore be interpreted so as to be compatible with Convention rights, so far as it is possible to do so.
8. Since most of the relevant statutory powers in the planning context confer discretions on the relevant authorities, for example as to whether or not to take enforcement action, it will almost always be possible to interpret the legislation compatibly, as requiring the discretion conferred to be exercised in a way which is compatible with Convention rights.
9. Sections 3 and 6 of the HRA 1998 therefore require planning authorities to act compatibly with Convention rights when exercising their planning functions. This includes the plan-making function, when the positive obligation to facilitate the enjoyment of relevant rights is most relevant, but it most directly affects the exercise of discretionary enforcement powers in relation to unauthorised developments.

III. THE RELEVANT CONVENTION RIGHTS

10. There are two Convention rights which are of particular relevance to Low Impact Development: Articles 8 and 9. Article 8 guarantees the right to respect for private life, family life and home. Article 9 guarantees the right to freedom of thought, conscience and religion, including the freedom, either alone or in community with

others and in public or in private, to manifest his religion or belief in worship, teaching, practice and observance.

11. Both rights are subject to justified limitations (under Articles 8(2) and 9(2)), where such interference is necessary in a democratic society in the service of various other enumerated interests, including most relevantly “the protection of the rights of others”, which has been interpreted to include the protection of the environment for others’ enjoyment.
12. Article 14 is also in principle relevant to any action by the State which treats different categories of people in different ways. Article 14 requires that no-one shall be discriminated against in the enjoyment of their Convention rights on any ground, including matters such as race, sex, national origin, or any other status.

(a) Article 8(1): The Nature of the Rights in Issue

13. It is clear beyond doubt that enforcement action against unauthorised development which is also somebody’s home constitutes an interference with their Article 8(1) rights which requires justification. It is also clear that Article 8 is engaged wherever there is an interference with a *de facto* home: the fact that the home was established unlawfully in the first place does not prevent it from being within the scope of Article 8, it is merely a factor to be taken into account in the overall balancing exercise in deciding whether or not the interference is justified (i.e. proportionate).
14. However, the precise nature of the rights which are in issue under Article 8(1) is important, because it will affect the approach which should be taken to assessing whether any interference with those rights is justified under Article 8(2). In particular, it will affect the

degree of deference (if any) which it is appropriate for a Court to accord to the balancing exercise conducted by the planning authority. Just as it is well established in Convention case-law that the nature of the right protected, and the nature of the activities being regulated, are important criteria in determining the appropriate scope of the margin of appreciation in a particular set of circumstances, so those factors will also be relevant to the degree of deference which is due to the judgment of the authority in making its own decision about whether enforcement action breaches Article 8.

15. On this question of how to characterise the rights in issue under Article 8(1), the European Court of Human Rights in Chapman v UK (2001) 33 EHRR 399 at para. 73 made a very clear finding which goes significantly beyond its earlier decision in Buckley v UK (1997) 23 EHRR 101. Whereas in Buckley the Court held (at para. 54) that the case concerned the applicant's right to respect for her "home" and considered it unnecessary to decide whether it also concerned the applicant's right to respect for her "private life" and "family life", in Chapman the Court expressly held that

"The applicant's occupation of her caravan is an integral part of her ethnic identity as a Gypsy, reflecting the long tradition of that minority of following a travelling lifestyle. ... Measures which affect the applicant's stationing of her caravans have therefore a wider impact than on the right to respect for home. They also affect her ability to maintain her identity as a Gypsy and to lead her private and family life in accordance with that tradition."

16. It also observed that this was the case even though many Gypsies no longer live a wholly nomadic existence and increasingly settle for longer periods in one place in order to facilitate, for example, the

education of their children.

17. Although Chapman concerned the traditional lifestyle of an ethnic minority, Gypsies, the Court's approach is of general significance for the approach required under Article 8. The Court's clear finding that measures affecting a Gypsy's stationing of their caravans affect not merely the right to respect for their "home" in the narrow sense, but their ability as a member of an ethnic minority to continue to live according to their traditional travelling lifestyle, is of considerable significance to the approach which should be taken by planning authorities to determining whether any interference with such an important right is justified in all the circumstances: the more important the Convention right, the greater the onus of justification on the public authority and therefore the greater the scrutiny that should be afforded to such justifications by the courts. In principle this is of equal application where the lifestyle concerned is that connected with Low Impact Development, particularly where it is derived from adherence to set of fundamental beliefs about the way in which one ought to live one's life. In such cases, Article 9 might also be engaged.

(b) Article 9(1): The Nature of the Rights

18. Article 9(1) ECHR protects the sphere of private, personal beliefs and acts which are intimately linked to these attitudes. In order to come within the scope of Article 9(1), beliefs have to attain a certain level of cogency, seriousness, cohesion and importance. The Convention case-law has accepted a number of different belief-systems as being within the scope of the right recognised in Article 9(1), and therefore requiring justification for its interference.
19. In CW v UK App. No. 18187/91, for example, the Commission accepted that the applicant's Vegan beliefs, which he said

prevented him from working with animal-tested products, fell within the scope of Article 9(1) (although it held that the interference with those beliefs was justified in the circumstances).

20. In Arrowsmith v UK (1978) 19 DR 5, pacifism was accepted by the Commission as a philosophy involving a commitment in theory and practice to the securing of political and other objectives without resort to the threat or use of force.
21. And in ISKCON v UK (1994) 76-A DR 90, the Commission was prepared to assume that the issue of enforcement notices in respect of the use of a building by the International Society for Krishna Consciousness was an interference with its freedom to manifest its religion under Article 9 (albeit again going on to find the interference to be justified).
22. To the extent that an individual's belief in Low Impact Development and/or Permaculture can be shown to amount to a well-defined ideology, with a core set of principles around which there is general consensus amongst "practitioners" of this lifestyle, it is capable in principle of falling within the scope of Article 9, by analogy with those sets of beliefs that have already been found to fall within its scope. In the Kings Hill appeal, the Secretary of State's Inspector accepted that Article 9 was engaged, but the Secretary of State himself differed from his Inspector in this respect. The matter has yet to be determined at the level of the High Court in the UK following the entry into force of the HRA.

(c) Article 14: The Nature of the Right

23. The right in Article 14 is a right not to be discriminated against in the enjoyment of a Convention right. It is not therefore a free-standing equality provision, but relates only to differential treatment in relation to Convention rights.

24. It is also important to appreciate that differences of treatment, even in relation to Convention rights, are capable of being objectively justified under Article 14. Not every difference of treatment therefore amounts to a breach of Article 14. What has to be established in order to make out a breach of Article 14 is that other people in an analogous or relevantly similar situation have been treated more favourably, and that there is no objective or reasonable justification for such difference of treatment.
25. In deciding whether a difference of treatment is justified in this sense, a court will look to see whether the difference of treatment serves a legitimate aim, and whether the means employed to achieve that aim are proportionate.

IV. THE REQUIRED APPROACH TO UNAUTHORISED DEVELOPMENTS

26. If either Article 8 or Article 9 ECHR is engaged, what is the effect on the approach which must be taken by planning authorities when deciding whether or not to take enforcement action against such a use which has already been established?
27. It is clear from the Court of Appeal's recent decision in Porter v South Bucks District Council [2001] All ER (D) 184 (12 October 2001) that the coming into force of the HRA requires planning authorities to take a different approach from before when deciding whether or not to take enforcement action against such an unauthorised development. Although the cases in Porter all concerned Gypsies and the exercise of a very specific enforcement power, namely the power to restrain breaches of planning control by injunction under s. 187B of the Town and Country Planning Act 1990 ("the TCPA 1990"), and focused on the approach which is to

be taken by *the court* when such an injunction is applied for, the Court of Appeal's consideration of what is required by Article 8 nevertheless has general implications for enforcement decisions against Low Impact Development on unauthorised sites.

28. Critically, at para. 39, the Court of Appeal held that, although the local authority's decision to seek injunctive relief will be relevant to the exercise of the court's discretion in deciding whether or not to grant the injunction sought, "the relevance and weight of the authority's decision will depend above all on the extent to which they can be shown to have had regard to all the material considerations *and to have properly posed and approached the Article 8(2) questions as to necessity and proportionality*" (emphasis added).
29. At para. 42 the Court held that proportionality requires not only that the enforcement measure (in that case, the injunction) be appropriate and necessary for the attainment of the public interest objective sought (the safeguarding of the environment), but also that it does not impose an excessive burden on the individual whose private interests (the Gypsy's private life and home and the retention of his ethnic identity) are at stake. The task which has to be undertaken is striking the necessary balance between those competing interests, and it has to be undertaken "in a structured and articulated way".
30. The question for planning authorities, therefore, in the light of their new duties under the HRA and the Court of Appeal's decision in Porter, is what approach they are now required to take when deciding whether or not to take enforcement action in relation to unauthorised developments which are also people's homes or interfere with their lifestyle which is the manifestation of their conscientiously held beliefs, and precisely how this is different from the approach taken previously. It is clear that the authority is now

required to deploy overt proportionality reasoning when making any decisions which interfere with Convention rights, by adopting a systematic analysis within a properly articulated framework of questions, as does the European Court of Human Rights itself.

31. But translating this into practical reality for decision-makers on the ground is notoriously difficult. In order to make the task more intelligible, it is possible to distill from the relevant Convention case-law (in particular Buckley v UK and Chapman v UK) a number of discrete questions which planning authorities must ask themselves and answer when deciding whether a particular step in relation to an unauthorised development would be compatible with the Convention rights of those affected.

(1) Nature and Extent of Interference with Article 8 or 9 Rights

32. In Chapman at para. 78 the Court found that the decisions of the planning authorities refusing to allow the applicant to remain on her land in her caravans constituted an interference with her Article 8(1) rights as identified above.
33. By the same token, any decision taken by a planning authority to take enforcement action against an unauthorised Low Impact Development, for example a decision to apply for an injunction requiring the occupants of a particular site to cease use of the land for such purposes, would be a specific measure which clearly constitutes an interference with the individuals' Article 8(1) or 9(1) rights, and therefore calls for justification under Article 8(2) or 9(2) ECHR as being "in accordance with the law", pursuing a legitimate aim or aims and as being "necessary in a democratic society" in pursuit of that aim or aims.

(2) Interference "in accordance with the law"

34. In Chapman at para. 79 it was conceded that the various measures which had been taken which interfered with the applicant's Article 8 rights were "in accordance with the law" for the purposes of Article 8. The requirement that interferences with Article 8 or 9 rights be in accordance with the law means that there must not only exist a formal legal basis for the interference (for example, a statutory discretion), but that laws which confer broad discretions must also give sufficient indication as to the the scope of that discretion: see e.g. Silver v UK (1983) 5 EHRR 347 at para. 85; Malone v UK at para. 68:

"... it would be contrary to the rule of law for the legal discretion granted to the executive to be expressed in terms of unfettered power. Consequently, the law must indicate the scope of any discretion conferred on the competent authorities and the manner of its exercise with sufficient clarity, having regard to the legitimate aim of the measure in question, to give the individual adequate protection against arbitrary interference."

35. Generally, a planning authority's powers of enforcement in relation to unauthorised developments will satisfy both aspects of this requirement. If the authority is in any doubt as to whether a particular power which it intends to exercise satisfies this requirement, however, it should ask itself whether the provision in question satisfies the Malone and Silver test, that is, indicate the scope of the discretion conferred on the authority, and the manner of its exercise, with sufficient clarity to give individuals in the position of those affected adequate protection against arbitrary interference.

(3) Legitimate Aim

36. In Chapman the Government argued that the measures in question pursued the enforcement of planning controls which were in the interests of the economic well-being of the country and the preservation of the environment and public health. The Court at para. 82 accepted the applicant's argument that the Government had not put forward any detail to substantiate the aims allegedly pursued but relied on a general assertion; it found that the measures pursued the legitimate aim of protecting the "rights of others" through preservation of the environment, and did not find it necessary to determine whether any other aims were involved.
37. As with the nature of the rights in issue, the precise aim pursued by a measure is a matter of importance when it comes to justification, because as a matter of Convention case-law the nature of the aim pursued is recognised to be one of the criteria which may affect the scope of the margin of appreciation to be afforded to the national decision-maker: "the scope of the margin of appreciation is not identical in respect of each of the aims [in Article 8(2)] justifying restrictions on a right" (Dudgeon v UK). Similarly, as a matter of domestic law under the Human Rights Act, the precise aim pursued by a measure may affect the degree of deference which is considered by a court to be due to the authority concerned.
38. Generally, the enforcement powers available to planning authorities will pursue the legitimate aim of protecting the rights of others in the sense of environmental protection. However, it remains necessary for the authority to be satisfied in any particular case that a particular enforcement measure is genuinely for such a legitimate aim, and not for some other illegitimate purpose such as merely appeasing a vociferous or politically important local population who are objecting to the particular development.

(4) Necessary in a Democratic Society

39. The next stage in the structured analysis required by the Convention is whether an interference with Article 8 or 9 rights is “necessary in a democratic society”. The abstract formulation of the test to be applied at this stage was restated in Chapman at para. 90 in familiar terms: an interference will be considered “necessary in a democratic society” for a legitimate aim if it answers a “pressing social need” and, in particular, if it is proportionate to the legitimate aim pursued. This is what is often referred to in shorthand as the proportionality requirement.
40. Although the test for proportionality is easily formulated in the abstract, in practice precisely what proportionality requires in a particular context turns on the application to the facts of each case of general principles for assessing the proportionality of the interference.

(a) The General Principles Derived from Buckley and Chapman

41. The general principles which are applied *by the Strasbourg Court* in assessing whether an interference with Article 8 or 9 rights is “necessary in a democratic society” are set out in para.s 90-104 of the Chapman decision.
42. The following are the general principles which can be extracted from both the Buckley and Chapman decisions as the principles which will be followed *by the Strasbourg Court* when assessing the proportionality of an interference with Article 8 or 9 rights in this particular context in the exercise of its supranational supervisory jurisdiction:

(i) A Presumptively Wide Margin of Appreciation

43. In principle, the national authorities enjoy a wide margin of appreciation “in so far as the exercise of discretion involving a multitude of local factors is inherent in the choice and implementation of planning policies”: Chapman at para. 92, Buckley at para. 75.
44. The rationale for this is also explained (see Chapman para. 92), and is principally the common sense reason familiar to any court (whether exercising a reviewing or appellate jurisdiction), namely that compared to the primary fact-finder the Strasbourg Court is not well equipped to challenge judgments which have been made on detailed questions of local fact after visiting the site and hearing oral evidence of witnesses. Planning Inspectors, in short, are much better placed to assess the impact of a particular use on the particular locality and therefore to assess the legitimacy of planning objections to that use. It is primarily a matter of relative institutional competence.
45. The effect of a presumptively wide margin of appreciation is that, in most cases concerning the exercise of planning judgment, the Strasbourg Court will confine itself to a standard of review, whether there has been a “manifest error of appreciation by the national authorities” (Chapman para. 92), which is not at all intense.

(ii) Factors Affecting the Width of the Margin of Appreciation

46. Although the Strasbourg Court’s starting point is a presumptively wide margin of appreciation in this context, it also explicitly recognises in Buckley (para. 76) and Chapman (para. 91) that certain factors will affect the width of the margin of appreciation to be accorded in any particular case. These factors include:

- (1) the nature of the Convention right in issue;
- (2) its importance for the individual;
- (3) the nature of the activities restricted; and
- (4) the nature of the aim pursued by the restrictions.

47. The Court in Chapman at para.s 93-94 also considered but did not accept the argument that a fifth factor should also be recognised as narrowing the margin of appreciation to be accorded to national authorities, namely the emerging international consensus amongst Council of Europe member States recognising the special needs of minorities and an obligation to protect their security, identity and lifestyle. The Court accepted that such an international consensus was indeed emerging, “not only for the purpose of safeguarding the interests of the minorities themselves but to preserve a cultural diversity of value to the whole community”, and this clearly informed its analysis of the nature of the Article 8 rights in issue (see above), but it was not persuaded that the consensus was sufficiently concrete for it to derive any guidance as to the conduct or standards which States consider desirable in any particular situation. It therefore declined to reduce the margin of appreciation accorded to States in light of that recognition.

(iii) The Importance of Procedural Safeguards

48. In determining whether the State has remained within its margin of appreciation when fixing the regulatory framework, the Strasbourg Court regards the procedural safeguards available to the individual

as being “especially material”: Chapman para. 92, Buckley para.s 76-77. In particular, it will “examine whether the decision-making process leading to measures of interference was fair and such as to afford due respect to the interests safeguarded to the individual by Article 8.”

49. The reason for paying particular attention to procedural safeguards in the decision-making process is because of the less intense standard of review adopted in relation to the substance of the measure which constitutes the interference, for the reasons explained above.
50. Whether in a particular case an individual has yet had the opportunity of taking a procedural step which they wish to take, such as exercising a right of appeal to the Secretary of State, should therefore be carefully considered by a planning authority when deciding whether or not to take enforcement action.

(iv) Recognition of a Positive Obligation

51. The Strasbourg Court has expressly recognised that the vulnerable position of Gypsies as a minority means that some special consideration should be given to their needs and their different lifestyle both in the relevant regulatory planning framework and in arriving at decisions in particular cases (Buckley para.s 76, 80, 84), and that to this extent there is thus a positive obligation imposed on States by Article 8 to facilitate the Gypsy way of life (Chapman para. 96).

(b) Relevant Factual Matters

52. Against the background of the above general principles for

assessing the proportionality of a given interference, it is possible to identify from the Court's decisions in Buckley and Chapman the following as the most important factual matters which are taken into account by the Strasbourg Court when applying its general principles to the concrete facts of a particular case in order to assess the proportionality of the interference:

(i) the seriousness of the impact of the measure on the most basic rights of the individuals concerned, including on the security of their accommodation, their family life, health, children's education and ability to maintain their traditional travelling way of life (Chapman para. 105);

(ii) the availability of an alternative site, including its suitability for the individuals' particular needs, the financial circumstances of those affected, and the efforts made to find alternative sites (Chapman para.s 103-104, 111-112; Buckley para. 81);

(iii) whether there has been a full and fair opportunity for the individuals concerned to make their case for respecting their Article 8(1) rights, including those arising from their Gypsy status, before the relevant administrative authorities, including a Planning Inspector (Chapman para.s 106-109; Buckley para. 80);

(iv) whether the site was established unlawfully (Chapman para. 102);

(v) the strength of the reasons relied on as the justification for the interference (usually this will be the protection of the environment) (Chapman para. 110);

(vi) the seriousness of the enforcement measures taken, and whether other, less restrictive enforcement measures were available (Buckley, para. 83).

53. A properly conducted assessment of the proportionality of an interference should therefore involve consideration of evidence relating to such of the above factual matters as are relevant in the particular case.
54. The approach of the Strasbourg Court in both Buckley and Chapman was that the initial assessment of the necessity for a particular interference must be for "the national authorities, who by reason of their direct and continuous contact with the vital forces of their countries are in principle better placed than an international court to evaluate local needs and conditions" (Chapman, para. 91).
55. Planning authorities, of course, are amongst those national authorities. Their relevant functions, as far as this type of development is concerned, include deciding whether or not to grant planning permission for a particular development, and whether to exercise various enforcement powers in respect of developments carried out without permission, including whether to issue an enforcement notice, whether to prosecute under an existing enforcement notice, whether to apply for an injunction to restrain a breach of planning control under s. 187B(1) TCPA 1990, and whether to apply to commit for contempt of a court order.

(5) Summary of the Approach Required under the HRA 1998

56. The question posed above was, given that the exercise of enforcement powers against unauthorised Low Impact Development

may constitute an interference with both Article 8 and Article 9 Convention rights, and at the same time is a measure pursuing the legitimate aim of protecting the rights of others (by preventing environmental harm), how should planning authorities go about deciding whether taking such enforcement action is, in all the circumstances, justified as being “necessary in a democratic society”? The question, essentially, is what counts, as a matter of domestic law under the HRA, as a proper assessment of the justification for the proposed interference.

57. As explained above, what an authority is required by the HRA to do is to conduct an overt and structured assessment of the proportionality of the interference it proposes, by asking a series of connected but analytically discrete questions designed to isolate the justification for interfering with a Convention right and to assist the authority in deciding whether the interference ultimately bears scrutiny as the sort of interference with a fundamental right that is acceptable in a modern democratic society.
58. There exist various formulations of the precise questions to be asked in conducting such a structured assessment of the proportionality of an interference with a Convention right. It is sufficient for present purposes to refer to the formulation relied on by Lord Steyn in R (Daly) v Secretary of State for the Home Department [2001] UKHL 26, (2001) 2 WLR 1622 at 1634H, taken from the Privy Council’s decision in de Freitas v Permanent Secretary of Ministry of Agriculture, fisheries, Lands and Housing [1999] 1 AC 69. A useful summary of the relevant questions can also be found in M. Fordham & T. de la Mare, “Identifying the Principles of Proportionality” in J. Jowell & J. Cooper (ed.s), *Understanding Human Rights Principles* (2001) at pp. 77-89, esp. p. 88.
59. On any formulation, a public authority such as a planning authority,

contemplating taking a measure which it knows will constitute an interference with a Convention right, must ask itself at the very least the following four questions:

(1) does the measure serve a legitimate aim (i.e. is the objective sufficiently important to justify limiting a fundamental right)?

(2) is the measure rationally connected to that aim (i.e. can it in fact serve to further that aim)?

(3) is it the least restrictive way of doing so (i.e. is the means used no more than is necessary to accomplish the objective)?

(4) is it proportionate in the longstop sense that, viewed overall, the measure does not place too great a burden on the individual for the good of the community?

60. Clearly, the proper conduct of this structured exercise in assessing proportionality should be conducted by the authority by close reference to evidence concerning the sorts of factual matters that the Strasbourg Court has made clear are relevant to any assessment of the proportionality of an interference in this context: the impact on the individuals concerned, the availability and suitability of alternative sites, and so on.
61. The justification for the authority adopting this stringent approach to assessing proportionality is clear from the decision in Chapman itself. Recalling the Strasbourg Court's general principles identified above, it is clear that the starting point of a presumptively wide margin of appreciation is irrelevant as far as the approach to be

adopted by the local planning authority is concerned: it *is* the “national authority” most directly and continuously in contact with the vital forces of the country, as described in Chapman at para. 91.

(7) A Practical Example: Kings Hill in Somerset

62. One of the few examples of the application of the above principles to Low Impact Development occurred in the case of the Kings Hill bender community in Somerset. The community were refused planning permission for their development and were enforced against by the local planning authority. They appealed against both the refusal of permission and the enforcement notices. At the inquiry before the Secretary of State’s Inspector, the community argued that to enforce against them was in breach of their Convention rights, relying primarily on Article 8.
63. The Secretary of State dismissed their appeal (the appeals having been called in for decision by him). In so doing he said that he had taken into account the Article 8 rights of the members of the community, but he expressly declined to take a view as to whether the enforcement action was incompatible with those rights. That decision was quashed on appeal by the High Court, on the basis that it was irrational for the Secretary of State to refuse to take a view as to compatibility with Convention rights when it was his policy (contained in the then current PPG1) to act in conformity with the UK’s international obligations. The matter was therefore remitted to an Inspector for the inquiry to be reopened.
64. At the reopened inquiry, the members of the Kings Hill community argued that to uphold the enforcement notices would be in breach of their rights under both Articles 8 and 9 of the Convention, because the interference with those rights was disproportionate as

it was not justified by any sufficiently weighty competing interests and therefore did not satisfy the test of being necessary in a democratic society. The Inspector agreed, and decided that refusing the appeals would be incompatible with their rights under both Articles 8 and 9 (finding that the latter was engaged because of the community's sincerely held beliefs about the importance of living in communion with nature). He therefore recommended that the appeals be allowed.

65. The Secretary of State disagreed that Article 9 was engaged, deciding that while the community's desire to live in their chosen fashion was strongly held, it did not, as such, represent a thought or matter of conscience akin to a religious belief that would be afforded protection under Article 9. He did, however, agree that the interference with their Article 8 rights required the appeal to be allowed. He agreed with the reasoning of the Inspector that the interference with their Article 8 rights, coupled with the lack of significant harm to issues of public interest, justified the allowing of the appeal notwithstanding that the development was not in accordance with the provisions of the development plan.

V. WOULD LID POLICIES BE DISCRIMINATORY?

66. Finally, there remains the question whether a policy which provided for Low Impact Development as an exception to the usual presumption against development in the open countryside would be discriminatory and therefore in breach of Article 14 (taken in conjunction with the right to property in Article 1 Protocol 1 or the right to respect for home in Article 8).
67. It is certainly the case that a person who can obtain permission for development in the open countryside pursuant to such a policy is being treated differently from a person who would also like to live in the countryside but cannot bring themselves within the policy

(because the development they proposes does not satisfy the relevant criteria for LID).

68. Such differential treatment is, however, as explained above, capable of objective justification, provided it serves a legitimate aim and the means employed to achieve that aim are proportionate.
69. Policies for LID clearly serve a number of aims which would be regarded as legitimate, including the pursuit of sustainability and responding to a clear need for places in which those living according to a low impact lifestyle are able to live.
70. The real test of such policies would be in their proportionality. That is a question which it is not possible to answer in the abstract. However, in principle a carefully drawn policy, with clearly defined criteria, and a carefully formulated approach to controlling this form of development, for example through the use of s. 106 agreements and management plans, should pass the test of proportionality and therefore be objectively justified. A loose policy, drawn in very vague and broad terms and giving too little attention to competing considerations about protection of the countryside, might be more vulnerable to successful challenge. The key test is justification.
71. In this respect, low impact development policies as exceptions to the presumption against development are no different in kind from the well established exceptions for agricultural and forestry dwellings. The key question is whether such exceptions can be justified.
72. The view of the plan-making authority that such a policy is justified is also likely to be given a high degree of deference by a court in any legal challenge, especially where such a policy has been through extensive consultation in the plan-making process.
73. Article 14 of the Convention, although in principle engaged, is

therefore unlikely in practice to be an obstacle to the adoption of LID policies.

VI. CONCLUSION

74. The Human Rights Act certainly contains a good deal which is relevant to the legal context in which issues concerning Low Impact Development fall to be decided. However, because the underlying Convention does not expressly safeguard the relevant values of sustainability and environmental concern, there is a limit to the extent to which it can make up for deficiencies in the overall legal framework which currently governs Low Impact Development. While the Act has something to offer in order to make up for the most obvious of those deficiencies, and is unlikely to create an obstacle to the adoption of LID policies, it cannot provide a substitute for the changes which are necessary to the overall planning framework in order to accommodate this important concept.

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2 August 2002

APPENDIX 5: QUESTIONNAIRE

Low Impact Development – Planning Policy and Practice

University of the West of England & Land Use Consultants

This questionnaire is investigating the nature and extent of LID in Wales. Some sections may not apply to you: you might not live on an LID or have plans for one, or might not know about all of the things we are asking about. Just fill in what you can / want to. Please copy the form if more than one of you wants to fill it out.

Remember that we guarantee to treat all sensitive information anonymously, but you have to tell us to do this.

Any queries please contact ***** or *****. Continue on separate sheets if you need to.

You don't have to give us contact details if you don't want to.

Name:

Telephone numbers:

Address:

E-mail:

YOUR LID: *this section is for those living on a LID or planning to, though if you are not but have contributions which would fit in please include them. Do you:*

Live on an LID ☐ Have plans for an LID ☐ Have another interest in LID ☐

Please explain:

Please give a summary description of your LID:

Please tell the story of your LID. Please also explain why you live / want to live on an LID? Have you lived in a similar way before?

What are your interests in living on / wanting to live on a LID?

sustainability ☐

habitat management ☐

affordable housing ☐

self-sufficiency ☐

woodland management ☐

innovative building ☐

community living ☐

producing food / other produce ☐

_____other ☐

permaculture ☐

employment ☐

_____other ☐

Please describe all the activities that take place on the site:

Details of your LID: *please give details of your LID under the following headings. Continue on a separate sheet / attach more information if you need to.*

Buildings: what buildings are involved in the LID? How many buildings? How big? What are they used for? What are their important features / technologies?

Land / habitat management: does the LID have an overall or partial management plan (however informal)? If so please explain.

Landscape impact: how has the landscape impact of the LID been tackled?

Water / energy use: what are the arrangements?

Waste management / recycling: what are the arrangements?

Food / other produce / goods from the site. What do you produce? What happens to it (e.g. consumed on the site, sold / traded locally or elsewhere)

Transport: what are the transport needs of the LID? How are they served?

Who lives on your LID? Adults (number) ☐ Children (number) ☐ Please explain the community structure:

Where did these people live before (place not type of house)?

Why did these people move to the LID (if not covered above)?

Please describe your linkages with local services and facilities (do you use the local shop, are your children in local schools etc.?)

Describe your relationships with local communities (do you get on with local people or not?)

How many of you are Welsh and / or Welsh-speaking?

How many of you work? Doing what and where? (please include paid and non-paid work, on and off the site). Food and other produce are covered above, but please give details of additional goods and services traded from the site or elsewhere

PLANNING: *this section is for those who have experience of or views on the planning system. Are you writing about your experience of:* (Do the consultees know what planning is and can distinguish it from other regulation systems that may be involved?)

An actual LID ☐ A planned LID ☐ Other perspective ☐ _____

Please explain, including a brief planning history if appropriate:

What are your views on the planning system's treatment of LID (planning rules, policy, processes, officers and councillors):

What are your views on how the planning system attempts to / might seek to control LID:

Have you had any experience of contact with other 'official' bodies' such as the Environment Agency, housing department or social services? What? How did it compare?

How necessary is it that the activities on the site are integrated? Do you need to live on the site? Why?

How much demand for LID is there in Wales? How might this change the Welsh countryside?

CASE STUDIES: *do you have any suggestions for case studies, either from Wales or elsewhere?*

OTHER COMMENTS: *if you have any other comments please add them here, continuing on extra sheets of including extra information if it would be useful.*

APPENDIX 6: Case Study Sustainability Appraisal and Photographs

Sustainability appraisal results

Social progress which recognises the needs of everyone

This section covers housing, community, cultural and health issues. The sample from the appraisal matrix has been completed for Brithdir Mawr.

Brithdir Mawr					
Sustainability objective	Criteria	Commentary	Criteria score	National / regional / local impact	Reversible / irreversible
Social progress which recognises the needs of everyone					
Housing	• provision of affordable housing meeting local needs	All accommodation on the site, including the roundhouse, is extremely affordable as it comprises part of a communal lifestyle. The roundhouse itself cost £3000 to build. The occupiers have a very low income but bear no debt for the dwelling. Insofar as it meets the needs of a member of the community it is meeting a need for affordable housing.	++	++l	n/a
	• provision of good quality housing	The roundhouse clearly meets the needs of its occupants. Although offering only simple accommodation the quality, as such, is acceptable.	+	+l	n/a
Access and community	• linkages to local services and facilities	The community as a whole has good linkages with local services and facilities. They use local shops, the Post Office, pubs and library. The children of the community are educated at home, but the teenagers attend the local college.	+	+l	n/a
	• relationships with local communities	The community has good relations with local people. Participation in local community activity is extensive. The community has listed over 30 separate activities including music and dance events in the village hall, collaborating with local people on working with horses, regular meetings with other local mothers / children, being members of local committees, such as the twinning committee, and conducting tours of the site and allowing access. The local Community Council are strongly disapproving of the fact that the roundhouse was build without planning permission. They have no objection to the principles the building is intended to serve but cannot condone it.	+	+l	n/a

		The need for more affordable housing in the area was supported, both for local communities and farmers. The Community Council confirms that the residents of Brithdir Mawr are well-integrated, active members of the local community.			
	<ul style="list-style-type: none"> community cohesion 	<p>Brithdir Mawr is organised as a community. Those who choose this way of life gain certain benefits from community living.</p> <p>The community as a whole is well-integrated into local community and economy. Community cohesion is encouraged.</p>	++	++l	n/a
<i>Culture</i>	<ul style="list-style-type: none"> origins of residents 	None of the residents is Welsh, though most of the adults have lived in Wales for over 20 years.	-	-l	n/a
	<ul style="list-style-type: none"> protection and enhancement of Welsh language and cultural heritage and diversity 	<p>Half of the residents speak and read Welsh, three fluently. Others are learning the language.</p> <p>Community members are involved in local arts, particularly music and dance, and also promote traditional crafts and land management techniques.</p>	~	~	n/a
<i>Health and well-being</i>	<ul style="list-style-type: none"> safe living and working environments healthy living and working environments 	<p>These issues are difficult to address in the context of LID. Whilst the accommodation and facilities at Brithdir Mawr are somewhat rudimentary, and the standard of living modest, the residents clearly state that they enjoy a good quality of life. In addition they suggest that because of the lifestyle of Brithdir Mawr they are physically and mentally fit and healthy, particularly in comparison with a 'conventional' lifestyle.</p> <p>There was no suggestion that any aspects of Brithdir Mawr were either unsafe or unhealthy.</p>	+	+l +r +n	n/a

Affordable housing: Elsewhere the desire to provide affordable housing was a key feature of all the LIDs. This is directly linked to the need to cut the costs of accommodation in order to be able to afford to undertake other elements of LID such as habitat management and the meeting of food and fuel needs from the site, which offer little if any economic reward. The quality of housing is also often raised. The residents of Tir Sisial explained that until they moved to the site they had occupied a succession of rented houses in the locality, seldom securing tenancy for more than a few months. As they are a large family this accommodation was relatively expensive. It was also generally of poor quality and although still in temporary accommodation on the site this is felt to be a significant improvement. Both at Tir Sisial and Tir Penrhos Isaf the owners wish to build a low impact house. Although neither would provide particularly extensive accommodation, its

modest nature would nonetheless offer acceptably high quality accommodation to the residents, who do not seek all 'mod. cons.'. The members of the Roundhouse project also noted that their building could be a way of finding affordable housing.

Access and community: Overall Brithdir scores well for social issues. It is organised as a community and this, to an extent, predisposes it to satisfying many of the criteria. As the survey of the nature and extent of LID in Wales also showed, however, the relationships with the local community are often good. This pattern continues across the other case studies. None of the five cases had experienced hostile relationships with neighbouring communities. Local services and facilities are the mainstay for most LID residents, particularly as they often travel less than other rural residents and therefore do not venture further afield to shop and for other activities. The residents of Tir Penrhos Isaf have always enjoyed the support of their local community council who describe themselves as "100%" in favour of the development, and thus in direct opposition to the views and decisions of the National Park. They are members of the local sawmill and wholefood cooperatives, and six other community groups of various types including cultural activities. Tir Sisial are fully supported by their local Community Council and confirmed their healthy integration into the local community. The Roundhouse Project appears to be locally accepted and Coed Hills are regarded by their local Community Council as 'alternative' but a welcome element of the locality. Specifically, and by way of example, the residents hosted a drinks party at the recent exhibition which was attended by over 100 villagers. They all joined in the village celebrations for the Jubilee and erected a yurt, organised pipe music and led everyone up to light the beacon.

Welsh language and culture: Across the other four case studies there are 16 Welsh residents and three from outside Wales. Of these five are fluent in Welsh and see it as their first language, six can 'get by' in Welsh and three do not speak or read the language.

Coed Hills is an unusual case, as its central purpose is the creation of a creative arts facility in a rural setting where artists are able to produce new work and where events and public exhibitions can be held. This feature of the project is of obvious cultural value (recognised through grant assistance and critical acclaim), but is likely to have limited repeatability.

In all cases the residents expressed a clear view that the LID offered a healthy lifestyle, principally through the work done outdoors and healthy eating.

Brithdir Mawr: roundhouse



Brithdir Mawr: energy supplies



Effective protection of the environment

Environmental protection and enhancement are frequent features of LID. This sample from the appraisal matrix is taken for Tir Penrhos Isaf, a site which has frequently been praised for its Permaculture management.

Tir Penrhos Isaf					
Sustainability objective	Criteria	Commentary	Criteria score	National / regional / local impact	Reversible / irreversible
Effective protection of the environment					
<i>Biodiversity</i>	<ul style="list-style-type: none"> conservation, enhancement and restoration of existing habitats, diversity and abundance of indigenous species 	<p>Management and enhancement of biodiversity are central to this site. Prior to the management regime now in place, the site was managed as improved, intensively (sheep) grazed pasture. The site is now made up of an intricate mosaic of habitats including naturally regenerating woodland with associated ground flora; extensively managed pasture with seasonal grazing by horses and sheep (and no added fertiliser); marshland occasionally grazed by horses; ponds and planted shelter belts. As a result there is now a highly diverse horizontal and vertical structure.</p> <p>Water quality in freshwater habitats is partly dependent on off-site influences. However, diffuse nitrate pollution as a result of run-off from grazed areas is minimised through the planting of tree shelter belts along the contours. These linear features also increase habitat connectivity across the site. Interesting bryophyte and lichen populations indicate a low pollution environment.</p> <p>Problematic species on the site include western hemlock, rhododendron and ragwort, but attempts are being made to control the self-seeding and establishment of all these species. Horse grazing of the purple moor-grass (<i>Molinia caerulea</i>) dominated marshy grassland areas keeps this species' dominance in check. Bracken is cut and used as a potassium fertiliser elsewhere on the site.</p> <p>All habitat improvement and management has been carried out without grant assistance, although it is likely that the site is eligible for Tir Cymen and Environmentally Sensitive Area payments.</p> <p>A wide range of habitats increases the niches for a wide range of</p>	++	++l ++r ++n (including conservation of national BAP target species)	++r

		<p>interesting floral and faunal species, including some less common species. Faunal species of interest include water vole, many woodland birds, raven and various birds of prey. Red squirrel was last sighted around 10 years ago.</p> <p>Floral species of interest include globeflower (<i>Trollius europeaus</i>), round-leaved sundew (<i>Drosera rotundifolia</i>), bog asphodel (<i>Narthecium ossifragum</i>), butterwort (<i>Pinguicula vulgaris</i>), broad-leaved helleborine (<i>Epipactis helleborine</i>), and heath spotted-orchid (<i>Dactylorhiza maculata</i>). The persistence of all of these species depends on the 'traditional' management regimes with low nutrient inputs.</p> <p>An appropriate and carefully considered management plan across this small site has resulted in significantly enhanced biodiversity across most faunal and floral groups, including the persistence of species that are no longer common in the wider countryside. Opportunities for ecological enhancement, maintenance and restoration have been identified and are on-going. The aesthetic benefits of this ecological improvement are also appreciated by the owners. .</p>			
<i>Landscape</i>	<ul style="list-style-type: none"> conservation and enhancement of distinctive natural and historic landscapes landscape intrusion 	<p>The landscape context of the site is plantation forestry with scrub and rough grazing. The development of the Permaculture management scheme for the site has resulted in significant benefits, re-creating diversity and traditional character.</p> <p>The site contains a number of structures but none are visible from any public vantage point, or indeed from many points around the site. This is because of the modest size of the structures and the density of the established planning on the site.</p>	<p>+</p> <p>++</p>	<p>+l</p> <p>++l</p>	<p>++r</p> <p>++r</p>
<i>Built environment</i>	<ul style="list-style-type: none"> conservation and enhancement of existing built environment form and design 	A small traditional barn has been preserved on the site. Other structures are of a simple utilitarian design. The current dwelling is a small caravan with wooden annex. The proposed replacement would have been a small wooden structure built from locally-milled timber: a very 'rural' building.	~	~	++r
	<ul style="list-style-type: none"> new development of a high standard 	No new development beside a stable block and a dismantlable horse pen has taken place on the site. The proposed house would be of a simple design.	~	~	++r

	<ul style="list-style-type: none"> innovative design solutions 	The proposed house would be made almost entirely of locally-milled timber, of minimal foundations and is designed to be able to be removed from the site and to allow the site's ultimate regeneration. It would be very small for a dwelling and highly energy-efficient.	+	+l	++r
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A detailed ecological assessment was made of all of the case study sites. The environmental credentials of LIDs are often highlighted and such a methodical examination was necessary. The results for Tir Penrhos Isaf are summarised above. Those for the other sites are below:

Brithdir Mawr

The site has been receiving payments under the Environmentally Sensitive Areas scheme for the past 7 years. The grassland areas, all of which are permanent pasture reverting to a semi-natural character with no addition of inorganic fertilisers or farmyard manure, are being managed as pasture or meadows, with a hay crop being taken for winter feed.

The woodland areas, many of which appeared to be of ancient origin, include 60 acres of naturally regenerating 'wilderness forest' as well as newly planted areas. Coppicing occurs in small patches of woodland designated for this purpose, and operates on a 7-20 year cycle of coppice-with-standards. Planted trees are of local provenance and frequently are translocated excess regeneration from within the site. The woodland areas are not part of a Woodland Grant Scheme.

Many of the hedgerows were in a poor condition when the site was acquired and much time and effort has been expended restoring them. Coupled with the maintenance of the green lanes (supported by ESA payments) these provide habitat connectivity across the site.

Species reported on the site include dormouse, tawny and barn owls. The meadows have above average species-richness and in one of the more acid grassland areas has a series of anthills suggesting a long period without disturbance.

The site is being managed under the principle that it is large enough to absorb most of the disturbance pressures. Three cows and a goat herd extensively graze over 30-40 acres. There are localised areas of poaching around barns and at gateways.

It tends to be logistically less easy to execute management plans on medium sized sites such as this, where there are many players. However, appropriate advice and grant aid has been sought from the Environmentally Sensitive Areas scheme and this is guiding much of the management. No species of exceptional interest have been recorded on the site, although this may be because the owners of the site had no particular knowledge of flora and fauna and no formal surveys had therefore been undertaken. Habitat management for nature conservation interest purposes does not seem to be the primary driving force of activity on the site, rather management geared towards the abstraction of useful products with nature conservation a happy concurrence.

Coed Hills

The primary interest is in the woodland as a source of art inspiration and materials. This woodland is a coniferous plantation over an ancient woodland site. A small area is being cleared each year in support of the artistic activities of the site. Financial return is viewed as an important part of the habitat management and thinned wood is sold as firewood. Species of violet (*Viola* sp.), primrose, dog's mercury (*Mercurialis perennis*) and lords and ladies (*Arum maculata*) are all present in areas regenerating following conifer clearance. Pastures are leased as dairy grazing to a neighbour on a gentleman's agreement. There is also some winter horse grazing. No hay or silage is made and in places the pasture is suffering from poaching.

The current area of highest ecological potential is a newly dug pond (approx. 1 acre) with island. As yet this has little aquatic or emergent vegetation but there is considerable potential for this to develop, as the pond and its immediate surroundings are fenced off from the surrounding grazing.

No specific management plan is currently in place at Coed Hills to maximise the ecological opportunities of the site, although the ad hoc woodland management is beginning to improve the woodland structure. No specific interest in ecology or biodiversity was expressed by the occupants of the site, and no formal botanical or faunal surveys have been undertaken.

The Roundhouse Project

An old nursery site has been planted with native broadleaved tree species approximately five years ago to be managed as coppice in the future. Although financial gain is not the main purpose of the project, one objective is to make the land management as productive as possible, and this will be achieved through the woodland management.

No formal faunal or floral surveys have been carried out on the site although a number of bird species were reported.

The site is currently not used a great deal and there was very little habitat disturbance.

Habitat management on this small site is being carried out on an ad hoc basis rather than to a long-term management plan. However, the owners of the site recognised the potential economic benefits of appropriate woodland management.

Tir Sisial

The site is a degraded ancient semi-natural woodland planted by the Forestry Commission in 1957 with conifer species, most notably western hemlock but with areas of semi-natural woodland remaining on the valley sides and with some wet pasture and alder woodland on the valley floor. There is much emphasis on the long-termism of the project.

The woodlands are being actively managed through the selective removal of softwoods in order to encourage natural regeneration of native broad-leaved species, with typical regenerating species including oak (*Quercus petraea*), downy birch (*Betula pubescens*), silver birch

(*Betula pendula*), and ash (*Fraxinus excelsior*) with occasional beech (*Fagus sylvatica*) and wych elm (*Ulmus glabra*), and an understorey of gorse (*Ulex europeaus*), broom (*Cytisus scoparius*) and bracken. Where tree planting has occurred, the stock used is of local provenance. The woodland is entered into the Forestry Commission's Woodland Grant Scheme (WGS) and the management plan is carefully tailored on a small parcel basis to reflect the patchwork of species present. There have been some additional discretionary payments for track works. Some ditch management is also being carried out.

Bluebell (*Hyacinthoides non-scripta*), wood anemone (*Anemone nemorosa*) and primrose (*Primula vulgaris*) are all reported to be increasing in abundance in the wood in response to the appropriate management. Dipper and kingfisher have been sighted in the river flowing through the site, as has otter. Two species of bat have been recorded and up to 20 raven have been counted in the valley. Invertebrate species include the beautiful demoiselle (*Calopteryx virgo*) and various species of hawker (*Aeshna* sp.) and clouded yellow butterflies (*Colias croceuro*).

Removal of wood from the plantation areas is being carried out using Land Rovers and trailers rather than heavy machinery to avoid unnecessary habitat disturbance and the hope is to use horses in the future. The extraction tracks cut were no wider than the necessary minimum, and wood chip and planks are being used to minimise localised poaching and disturbance along frequently used routes.

A carefully considered long-term management plan, drawn up with the relevant competent statutory authorities, is already beginning to display both its ecological and economic benefits, with both floral, and more significantly, faunal, populations on the site being maintained and enhanced. The owners of the site specifically stated the aesthetic pleasures gained from this management and were actively involved in identifying and logging species seen on their land.

Had these sites been scored on the matrix they all would have recorded positive scores, though less strong than those for Tir Penrhos Isaf.

Landscape intrusion and built environment impacts: These vary across the cases. At Brithdir Mawr, although the planning Inspector considered the roundhouse to be harmful to the natural beauty of the national park (see 9.16), the structure is virtually invisible from any public vantage point or, indeed from most places within the holding. It is a very distinctive building, whose impact tends to polarise opinion, illustrated by the evidence of Malcolm Parry, Head of the Welsh School of Architecture, in favour of the building:

"In design terms the house fits its site splendidly - appearing to grow organically from its setting. Its materials are exemplary in 'sustainable' terms in that they are recycled, or recyclable or biodegradable".

The Inspector took issue with these comments.

The main farmhouse at Brithdir Mawr is Listed Grade II and has been restored by the community. Other buildings on the holding are constructed mainly from local materials and seek to have a low environmental impact, visually and in terms of their materials and construction.

At Coed Hills new structures are small and temporary. There have been two barn conversions, though. A range of stone barns have been converted to a dwelling, multi-purpose and studio space and a café in a sympathetic fashion. A modern hay barn has also been converted to a workshop / performance space to attractive effect using timber from the site.

At the Roundhouse Project the second, replacement roundhouse, is not complete. It will be larger than the first roundhouse and of more substantial construction. The first roundhouse was of clear conservation and historic interest, and was used for educational visits from local schools. Its replacement will be similarly interesting.

The buildings currently at Tir Sisial are quite intrusive as they are poorly sited up the valley side and of poor quality. It is intended, though, that they be removed and replaced with a new Low Impact dwelling on the valley floor, where it would be largely hidden from external view.

None of the cases causes significant landscape intrusion, though the buildings at Tir Sisial are poorly sited. Although in two cases the buildings the owners currently live in are not those they wish to build as purpose-designed elements of their LID, the two roundhouses, the converted barns and the two planned low impact houses all have some merits to their design.

Tir Penrhos Isaf



Prudent use of natural resources

Natural resource efficiency is another feature commonly associated with LID. Brithdir Mawr is assessed below as good data exists for this case, though the others are also examined in some detail below.

Brithdir Mawr					
Sustainability objective	Criteria	Commentary	Criteria score	National / regional / local impact	Reversible / irreversible
Prudent use of natural resources					
<i>Generally</i>	<ul style="list-style-type: none"> pursuit of natural resource use efficiencies 	Natural resource use efficiencies are at the heart of the community's approach to development and are particularly evident in the construction and use of the roundhouse.	++	++l	++r
	<ul style="list-style-type: none"> recycling / waste minimisation / waste management 	The only waste thrown away from the site is plastics (from a community of 23 people). One 'black bag' is collected each week by the local authority. Glass and metals are recycled at community facilities. All toilets on site are compost toilets. The community lifestyle and high degree of self-sufficiency in food, fuel and building materials favours waste minimisation.	++	++l ++r +n	++r
	<ul style="list-style-type: none"> prevention or management of pollution and promotion of good environmental practice 	All grey water on the site is processed by reed-bed systems. The holding's agricultural and land management systems minimise pollution. The site is used as an example of good environmental practice and attracts hundreds of visitors a year.	++	++l ++r ++n	++r
	<ul style="list-style-type: none"> utilisation of food and other resources from site 	The community is not entirely self-sufficient in food. They are able to meet all their needs for vegetables, milk, eggs and meat, and sell some surplus at certain time of the year. Pulses and other wholefood products are bought in bulk by the community. The site provides timber and turf for new buildings and fencing.	++	++l	++r
<i>Energy</i>	<ul style="list-style-type: none"> use of renewable energy sources / reduction of 	The main energy sources for the holding are renewable. In winter, electricity is mainly provided by a mini hydroelectric system	++	++n	++r

	reduction of consumption of non-renewable energy	<p>incorporating a Harris pelton wheel operating on a head of 3-4m, supplemented by an AWP wind generator, and in summer by three BP Solar PV arrays. This provides a constant 12v DC supply for lighting and other low power demands. For 240v AC supply a Trace inverter is utilised. Power is stored in second hand MOD lead/acid submarine batteries with a capacity of 1500+ amp/hours. All electricity needs are met from these sources and the site is not connected to the grid.</p> <p>The main source of fuel for heating is wood from the site. In addition bottled gas is used for some cooking: 350 kilos a year by the residents and 180 in the guest hostel.</p>			
	<ul style="list-style-type: none"> high levels of energy efficiency 	<p>The roundhouse requires only low levels of energy to heat it, as does the geodesic house. Other buildings on the holding are less energy-efficient but, particularly for electricity, the holding shows great energy efficiency simply in terms of the gross low energy use of the residents.</p>	++	++n	++r
	<ul style="list-style-type: none"> low levels of embodied energy 	<p>Much of the residential accommodation at Brithdir Mawr makes use of converted or restored buildings at relatively high residential density. Thus the embodied energy levels in this accommodation is low as the buildings already existed.</p> <p>The roundhouse is constructed from a mixture of local timber thinnings, straw bales, mud, recycled materials and a sheet of butyl rubber for the roof membrane. Other agricultural buildings are also built from renewable materials, mainly sourced from the site. The embodied energy in these materials is particularly low.</p>	++	++n	++r
<i>Land</i>	<ul style="list-style-type: none"> re-use of previously developed land / buildings 	As detailed above the community has reused a number of farm buildings but the roundhouse is located on a greenfield site.	~	~	+r
<i>Water</i>	<ul style="list-style-type: none"> water sources 	The only water supply for the entire site is a spring.	++	++l	++r
	<ul style="list-style-type: none"> waste water management 	Waste grey water is processed through reed beds, both for the main farm complex and the roundhouse. Also, both developments use only compost toilets so black water is not created.	++	++l	++r
<i>Air and atmosphere</i>	<ul style="list-style-type: none"> reduction of air pollution 	<p>CO₂ emissions are relatively low due to both the low levels of domestic energy use and motorised transport use.</p> <p>The other principal source of air pollution is wood burning, but in this</p>	+	+l	+r

		rural setting this is not significant.			
<i>Minerals / building materials</i>	<ul style="list-style-type: none"> • use of renewable / recycled resources / minimisation of use of non-renewable resources • use of traditional materials 	<p>The renovation and conversion of the buildings in the main farm complex used traditional materials, though locally-sourced where possible.</p> <p>The roundhouse is partially earth sheltered and constructed from locally-sourced Douglas fir thinnings to recreate a timber framed henge structure, with 400mm cordwood external walls, recycled double-glazed windows and a roof covering of turf on a single ply rubber membrane on insulation of straw bales fixed to the roof structure. The floor is of timber and compacted earth. A wood stove provides heating and hot water for winter use and a solar panel made from a recycled steel panel radiator for summer hot water. Electricity is from a 12V solar PV array. The majority of materials in the building are renewable or recycled, in stark contrast to most modern houses.</p> <p>In addition the new agricultural buildings constructed on the holding are similarly build from mainly renewable materials.</p> <p>The materials of the buildings in the main farm complex are of a 'traditional' nature. Whilst not from the last 1000 years, the materials of the roundhouse and recent farm building are traditional in the sense of more ancient history.</p>	<p>++</p> <p>~</p>	<p>++l ++n</p> <p>~</p>	<p>++r</p> <p>n/a</p>
<i>Transport</i>	<ul style="list-style-type: none"> • minimisation of the need to travel • use of modes other than the private car • efficient use of transport • support for an integrated transport system 	<p>These criteria will be addressed together. Brithdir Mawr has collected details of the transport use of 14 residents (12 adults, 2 teenagers) for the year 2001. The UK averages for rural areas have been added. See table on the next page.</p> <p>The residents of Brithdir Mawr make under two thirds of the average number of trips for a UK rural resident. Further, their modal split is biased away from the car in favour of other modes. The level of car ownership is much lower than the average, and the average mileage by car per person per year is only 28% of the average for UK rural residents. The four cars of the community are operated as a car pool.</p> <p>Thus for transport the site scores well as the need to travel is clearly minimised, the use of the private car is reduced, other modes are favoured and efficient use of transport is made as lifts are often shared. In addition many of the community's needs are met from the site and others are sourced locally. Nevertheless, for two days a week</p>	<p>++</p>	<p>++l</p>	<p>n/a</p>

		many community members work away from the site. Brithdir Mawr is in a relatively isolated location which is very difficult to serve by public transport.			
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Table 8.5 : Transport use at Brithdir Mawr: Modal Split

	Trips per year Brithdir Mawr 2001		Trips per year UK average 1997/9
Car (driver)	232	Car (all) 358 (55%)	Car (all) 758 (73%)
Car (passenger)	126		
Walk	98 (15%)		203 (20%)
Bicycle	88	Other (all) 202 (30%)	76 (7%)
Motorbike / scooter	20		
Bus	74		
Train	10		
Horse	10		
TOTAL	656		1037

(UK data from DLTR. Average for both urban and rural areas)

39% of households in rural areas in the UK own two or more cars (1997/99) whereas 23 people at Brithdir Mawr share four cars.

These four cars average a total of 8000 miles a year each, giving an average across the 14 users of 2286 miles a year. This compares to the average car mileage per person (1997/99) for the UK of 8052 miles.

Natural resource use: All of the other case study sites sort their waste, recycling or composting all but plastics, which are collected by the local authority. None are connected to mains drainage, three using compost toilets and one a septic tank. Again, the lifestyles of LID residents tend to involve meeting many needs from the site, minimising waste production.

Brithdir Mawr, Tir Penrhos Isaf and Tir Sisial all utilise organic and Permaculture growing approaches, so there is no use of artificial pesticides or fertilisers.

All of the case studies have hosted educational visits which included promotion of environmental good practice.

Food and other resources from the site: Tir Penrhos Isaf and Tir Sisial both meet a considerable proportion of their food needs from the site, particularly during the summer. Coed Hills do not, having only a small garden, though they plan to increase its productivity. Nobody lives at the Roundhouse Project, so the issue does not arise, although the building is located in an increasingly derelict market garden which offers considerable scope for food production, should residence be allowed.

Coed Hills are undertaking limited extraction of timber from their woods as part of their management. This timber was used in the construction and conversion of all structures on site with the exception of the stone barn. This timber is also being used in the construction of the Roundhouse Project. Coed Hills also slake their own lime and this has been used in construction. Similarly Tir Sisial use their own timber for construction and Tir Penrhos Isaf would have used local timber milled though the local cooperative sawmill if they had been granted permission for their proposed dwelling.

Use of renewable energy sources: Coed Hills use electricity from the grid but are currently fund-raising to buy a wind turbine. The Roundhouse Project is not occupied so these considerations do not arise. Neither Tir Sisial or Tir Penrhos Isaf are connected to the grid. Tir Sisial currently use a 4kVA diesel generator to power workshop tools and to charge a battery bank for their dwelling. They are deliberately keeping their energy use within 4kVA so that they will not exceed the capability of renewable resources. Tir Penrhos Isaf charge a 250 amp hour battery pack from a small windmill and photovoltaic array but supplement this supply with a small petrol generator, using one gallon a week in the winter and every two weeks in the summer. Both cases plan to use the streams flowing through their sites for hydro electricity generation but both have not invested in the necessary equipment in the face of an uncertain planning future.

In all cases the main fuel for heating is wood, from local sources. In addition, wood is also used to heat some water and for some cooking at Tir Penrhos Isaf and Tir Sisial. Gas is used for other water heating and cooking at these sites and Coed Hills use oil. Tir Penrhos Isaf also note that they are planning to substitute the butane gas with methane from composting, and that solar water heating is used in the summer.

Energy efficiency: In the four case studies other than Brithdir Mawr the low impact dwellings the residents desire have not been built or completed for a variety of reasons. The temporary accommodation which they mostly occupy is small, and therefore easy to heat. These are not particularly energy-efficient buildings but the buildings which the residents wish to replace them with, would have high energy efficiency as a major design consideration.

Embodied energy: Many of the residential structures at Coed Hills (such as re-used railway wagons) and the temporary accommodation at Tir Penrhos Isaf and Tir Sisial are re-used and thus have reduced embodied energy burdens when compared with new-build housing. The materials for the Roundhouse Project and other structures at Coed Hills are sourced very locally, and similar arrangements are envisaged for

the new houses at Tir Sisial and Tir Penrhos Isaf, should either be allowed. The embodied energy levels of such structures would be very low.

Re-use of previous development: Coed Hills have re-used two barns, and Brithdir Mawr have re-used a range of farm buildings.

Water sources: Coed Hills has a mains water supply. Tir Sisial and Tir Penrhos Isaf take water from a well and a spring. All have reed bed systems for grey water processing.

Reduced pollution: As for Brithdir Mawr, air pollution from Coed Hills, Tir Sisial and Tir Penrhos Isaf is comparatively low due to low levels of energy use, but local pollution from wood burning is caused. The members of the Roundhouse Project, because they do not live on site, live in the surrounding area in conventional homes and use cars to travel to the site and their work. Thus their pollution contributions will be higher.

As for Brithdir Mawr the other case studies tend to make greater use of renewable and recycled resources and to minimise the use of non-renewable resources. Issues concerning 'traditional' materials are also similar.

Travel: The most detailed information on transport use came from Brithdir Mawr. Tir Penrhos Isaf make an average of six regular journeys a week, which are made by a combination of car (more in the winter), cycle and horse. They travel around 5,000 miles a year by car. Tir Sisial has only one road-vehicle. The community at Coed Hills share two cars and also use two horses, bicycles and buses. The transport situation of the members of the Roundhouse Project is described above. Although not quantified in the same detail as for Brithdir Mawr similar features of transport use emerge:

- lower number of trips per person as more needs are met from site
- lower levels of car use / shared car use
- consequently lower annual distance travelled, particularly by car (and despite rural locations).

Maintenance of high and stable levels of economic growth

The economic performance of LID is not well understood and sometimes subject to incorrect assumptions. Tir Sisial have provided considerable detail of their business.

Tir Sisial																									
Sustainability objective	Criteria	Commentary	Criteria score	National / regional / local impact	Reversible / irreversible																				
Maintenance of high and stable levels of economic growth																									
Economic diversification	<ul style="list-style-type: none">diversification or enhancement of the rural economy	<p>The Ashling business comprises woodland management, manufacture of products from timber from the site and a herb nursery. It is run by the two adult members of the family, with other occasional labour and trainees used.</p> <p>The business has been established for four years, receiving a variety of grants from the Local Authority (3) and the Welsh Development Agency (1) , facilitated by Business Connect. Coed Cymru have also been very helpful. The Forest Commission has also provided grant aid for woodland management.</p> <p>The simplified accounts for the first four years of trading are as follows:</p> <table><tr><td></td><td>1998/9</td><td>1999/2000</td><td>2000/01</td><td>2001/02 (11 months)</td></tr><tr><td>Turnover</td><td>13,000</td><td>14,500</td><td>21,500</td><td>13,250</td></tr><tr><td>% capital investment</td><td>80%</td><td>60%</td><td>80%</td><td>20%</td></tr><tr><td>Profit</td><td>4,000</td><td>4,250</td><td>5,750</td><td>4,000</td></tr></table>		1998/9	1999/2000	2000/01	2001/02 (11 months)	Turnover	13,000	14,500	21,500	13,250	% capital investment	80%	60%	80%	20%	Profit	4,000	4,250	5,750	4,000	++	++l	n/a
	1998/9	1999/2000	2000/01	2001/02 (11 months)																					
Turnover	13,000	14,500	21,500	13,250																					
% capital investment	80%	60%	80%	20%																					
Profit	4,000	4,250	5,750	4,000																					

		<p>It is important to note that for the first three years a high degree of capital investment distorted the figures and that the last year has in effect been the most successful. The profits, which the family lives on, are not large, and are currently topped up by Tax Credits worth a little over £9,000 a year. Capital investment was paid for through a loan costing £2800 a year to service.</p> <p>The Ashling business is making a small, yet positive, contribution to the rural economy. The types of enterprises the business undertakes, diversifying the agricultural base, adding value at source to products and incorporating environmental management, are of the types strongly encouraged by both economic development and planning policies.</p>			
	<ul style="list-style-type: none"> re-integration of agriculture back into a more diversified rural economy 	The Ashling business clearly satisfies this criteria.	++	++l	n/a
<i>Local businesses</i>	<ul style="list-style-type: none"> quality, durable, environmentally suitable and flexible employment opportunities 	Ashling provides employment for the adults of the family. Also, between 1998 and 2002 eight people aged 18-25 have trained at the site as part of the New Deal Environmental Task Force (ETF). Five have gone on to find related employment. One still works at the site and one other remains at the site still on the ETF programme. In addition, the business has employed three other local people on short term and casual terms. Thus not only has Ashling provided employment for the occupiers of the site it has also provided limited local employment and beneficial training opportunities.	++	++l	n/a
	<ul style="list-style-type: none"> production of goods and services for sale 	The main products of the business are timber garden furniture and accessories (bird tables, nest boxes) and a very wide range of organic herbs. The main service is training. Both are of limited scale but the mainstay of the holding business.	++	++l	n/a
	<ul style="list-style-type: none"> utilisation / enhancement / diversification of traditional rural skills 	Woodland management, horticulture and the manufacture of goods from forest products are traditional rural skills. Most of the timber products are made from green timber thinnings, which has required the development of new techniques to ensure the quality of products.	++	++l	n/a

Access	• on-site employment	All the residents employment is provided on-site.	++	++l	n/a
	• local off-site employment	The residents do not need employment off-site, but have provided employment for local people.	++	++l	n/a
	• unemployment amongst residents	The residents are not unemployed, but do benefit from Tax Credits.	+	+n	n/a
Encouraging investment	• wealth creation and attraction of investment	Ashling is only a modest business, and is not generating large amounts of wealth or attracting inward investment. The benefits of the business are not confined to the residents though. Local people are employed, products are sold through local markets and supplies are sourced from local sources where possible.	+	+l +r ~n	n/a
	• use of indigenous resources	The raw materials, other supplies and labour for the business are extremely local.	++	++l	n/a

The business profiles of the other four case studies vary. At Brithdir Mawr all community members devote three days a week to community work on the holding: gardening, woodland and other environmental management, tending livestock, domestic tasks, repairs and construction and so on. They are free to work for themselves for the remaining two days a week. Activities include working as a plumber, electrician, woodworker, in local shops and pubs, gardening, and one resident works part-time for CADW. The holding also receives around 1,000 visitors a year, who generate a significant amount of work. On average residents spend one working day a week off-site.

Similar to Tir Sisial, the contribution to diversification of the rural economy is modest but positive. In particular, the sales of surplus produce and of woodland products clearly are working to integrate agriculture and forestry on the holding into the rural economy, and retain and diversify traditional rural skills. Providing bands for local events and selling CDs also generates a modest income.

The cash-employment needs of the residents are low as many needs are met from the site. Many employment opportunities are generated, but are not monetarily rewarded. The extra work undertaken by some residents is mostly local. Though some of the residents may be eligible for State support all chose not to take up benefit entitlement, seeing this as contrary to the ethos of a low impact livelihood.

Tir Penrhos Isaf also supplied some accounts:

Accounts 2000

Income - External Sales		Expenditure - External	
Livestock	524	Re: Livestock	890
Food & Plants	1384	Re: Premises	1750
Timber & Materials	520	Food	3460
Courses & Visits	6060	Clothing	420
Horse Training	4547	Fuel & Power	1470
Outside Work	10160	Drawings	4800
	23195	Insurance & Charges	889
Income - Internal Sales			13679
Livestock	96	Expenditure - Internal	
Food & Plants	380	Re: Internal Sales	916
Timber & Materials	200	Land Improvement	650
Fodder	240		1566
	916		
GROSS INCOME	24111	TOTAL EXPENDITURE	15245
SURPLUS INCOME	8866		

Again their income comes from a variety of sources including products from the holding, educational activities on the holding, training horses and outside work (teaching in a local college, Permaculture consultancy, other small elements of work).

Expenditure is all costs of living and working at the holding and includes the cost of their failed planning application.

Again a modest surplus is derived, mainly generated by different types of participation in the local rural economy.

The residents of Tir Penrhos Isaf are keen to point out that they neither seek any grant assistance for their activities or any state support.

(these are the accounts submitted in support of their planning appeal where the inspector discounted the horse training on the site and outside work and concluded that the proposal was '*unsustainable*')

The residents of Coed Hills, outside their arts activities and work on the holding, work as a tree surgeon, running a whole food cooperative, as a stonemason, as a professional artist and one is a student. They are constituted as a not for profit organisation and all personal income

is pooled for the work of the community. They also point out that their annual summer arts event, attracting 4,000 visitors last year, has spin-offs for the local economy.

The members of the Roundhouse Project work as a tree surgeon and rope course leader, a tree surgeon and furniture restorer and as a drummer. As explained above they do not live at the site, living in conventional accommodation locally, and thus live more 'conventional' lives.

In addition, for all five case studies it was mentioned that a significant element of their local economic involvement was through exchange, barter and more formal non-cash systems such as LETs which has been established as giving significant support to local economies and communities.

Whilst the cases do not promote high levels of economic growth (with many of those interviewed happy to operate on a weekly income of £35/week) their contribution is steady and locally-based.

Factors particular to LID

The review of the literature and the nature and extent of LID in Wales has highlighted three factors which are central to the philosophy of LID and the livelihoods it involves. These have not been drawn from current policies for sustainability and land use planning. They are, instead, at the crux of defining LID and seeking to manage it through new policies. Thus, instead of being applied to the case studies narrowly here they are addressed at length in the discussion chapter of this report. They are:

- self-sufficient livelihoods
- integrated site management
- necessity of residence on-site

Tir Sisial: current buildings



Tir Sisial: produce



The Roundhouse Project



Coed Hills



Control case - Yerberston Gate Farm / Farm Shop

Yerberston Gate Farm was a case study in the study *Farm Diversification and the Planning System, National Assembly for Wales* (2001). It is a 24 hectares working farm in Pembrokeshire with a herd of 60-80 Welsh Black cattle and a farm shop selling Welsh Black Beef and a range of other products including vegetables and other produce from other local farms. The shop now provides 80% - 90% of the total farm income. Planning permission for the farm shop was granted in 1999.

This case was selected as a simple control for the sustainability appraisal, not for detailed comparison, but to provide some insight into the relative sustainability benefits of LID compared to a traditional farm. A diversified farm was deliberately selected to represent this increasingly important dimension of the rural economy.

At Yerberston Gate, housing for the family is in the man farmhouse. Linkages with local facilities and relationships with the local community are good, and the farm shop is now the only local shop. The farm family is from a line of Welsh farmers.

The farm is now down to ley pasture with maintained hedgerows one small area of unimproved rushy grass in an area of poor drainage. It also has a small area of unmaintained semi-natural woodland.

The farmer is interested in wildlife but on a farm of this size needs to manage his grasslands intensively to maximise economic returns. There is no conservation management plan for the farm and the farm is not entered into Tir Cymen.

The buildings on the site are mainly traditional. The farm shop is in a converted barn.

The environmental impact of the farm is typical of a small farm in a rural area. Heating and lighting are from non-renewable sources, water and waste management systems are conventional and the use of renewable and low embodied-energy resources is not prioritised. Welsh Black beef is the main resource taken from the site.

The farm provides employment for the farmer, his partner and their son. Two daughters work in Pembroke. The main means of transport is cars. Virtually all customers visit the farm shop by car.

The farm, especially the farm shop, is making a clear contribution to the local economy and represent both rural and farm diversification.

A comparison of the sustainability performance of this farm compared to the LID case studies is provided in Chapter 10. This Chapter also provides a thorough review of the comparative sustainability benefits of LIDs in Wales