



Landscapes of the Future



Land underpins the whole economy, through provision of food and other goods and its use for housing, business, transport, energy, tourism and recreation.¹ The UK faces major challenges addressing projected population increases, climate change and economic growth with limited land and natural resources. This POSTnote examines how policy structures, including planning reforms, might deliver land use systems that meet these challenges.

Background

Land and natural resources are finite (POSTnote 370) and increasing demand can cause conflicts between different land users. Land use and planning is complex with multiple layers of legislation, conventions and policy (Box 1). Some commentators feel the public administration of land management is lacking in clarity of purpose and is inefficient.

The European Landscape Convention (ELC) defines landscape as “an area, as perceived by people, whose (sic) character is the result of the action and interaction of natural and/or human factors”. Historical changes in land use such as deforestation, industrial development and intensive agriculture, are evident in landscapes today and will continue to shape their use. Most of the landscape is in private ownership and managed to deliver benefits with market value (POSTnote 377). Society gains essential benefits or services from the natural environment, known as ecosystem services, such as food, fuel, clean water, flood protection and recreation. The UK “National Ecosystem Assessment” (UK NEA), due to be published in June 2011, is the first analysis of these services, how they might change, and the effects of change and policy options to

Overview

- Competition for land will be exacerbated by many pressures in the next few decades. Prevailing patterns of land use may not be viable in the long term and may not match the future needs of society.
- Strategic planning policy should include consideration of green infrastructure, landscape character and provision of multiple ecosystem services.
- Balancing competing demands for land through complementary uses in a single area will help adaptation to environmental change.
- This will require integration across policy areas, such as the innovative Land Use Strategy for Scotland, and other pioneering governance approaches, such as the ecosystem approach. The Natural Environment White Paper aims to address this in England.

secure and improve delivery under plausible future scenarios.² At a similar time the government will outline an ambitious vision in the Natural Environment White Paper (NEWP).

Impacts of Land Use Patterns

Traditional approaches to land use have focussed on single, mono-functional purposes, often with negative consequences. For example:

- many food production systems will not be viable in the long term due to heavy reliance on fertilisers and fossil fuels, soil degradation and emissions of greenhouse gases. A recent government report, “The Future of Food and Farming”, detailed how urgent action is needed to redesign the global food system.³
- a recent review of England’s wildlife sites and connections between them, “Making Space for Nature”, recognised their contribution to ecosystem services but concluded that they are highly fragmented, mostly too small, insufficiently protected and under-managed.⁴
- Green Belts are designated to prevent urban sprawl but have been criticised by some commentators for promoting “leap frogging” of development, thereby increasing commuting distances and carbon emissions.⁵

The ecosystem approach offers a more holistic way to deal with future challenges by seeking to integrate management of natural resources and ensure their long term viability in an equitable way (POSTnote 377). The Department for Environment, Food and Rural Affairs (Defra) is promoting an ecosystem approach to policy and decision-making.

Box 1. Policy Affecting Landscapes

	European	National	Local
Landscape	European Landscape Convention	National Parks Areas of Outstanding Natural Beauty	
Built Development		National Planning Policy Framework (incl. Green Belt) Major Infrastructure	Local authority plans Neighbourhood plans in Localism Bill
Biodiversity & Geodiversity	Protected sites e.g. Ramsar Sites, Special Areas of Conservation, etc.	Protected sites e.g. Site of Special Scientific Interest, National Nature Reserves	Non statutory sites e.g. Local Wildlife or Local Geological Sites
Agriculture	Common Agricultural Policy (CAP)	Environmental Stewardship	

The European Landscape Convention, signed and ratified by the UK in 2006, recognises the interaction between natural and human forces in shaping landscapes, and promotes the protection, management and planning of all landscapes, rural and urban. The 15 National Parks and 46 Areas of Outstanding Natural Beauty in the UK are designated to protect the “finest” landscapes.

Planning reforms proposed in the Localism Bill would give greater powers to local communities. The government plans to consolidate policy statements, circulars and guidance documents into a single National Planning Policy Framework. Major infrastructure decisions will be made by the relevant Secretary of State.⁶ England has 14 Green Belts; areas of countryside that surround major towns and cities where development is restricted. They cover nearly 13% of the country. In the 2011 Budget, the government stated that existing Green Belt controls would be retained. Agricultural land covers almost 75% of the UK, while 80% of the population live in urban areas.¹ The Common Agricultural Policy (CAP) represents roughly 40% of the EU budget and provides direct payments to farmers. Payments are also available through agri-environment schemes to manage farmland for a variety of public goods and services, as well as for food production. In England this is Environmental Stewardship, with payments awarded for hedgerow management, in-field trees and uncultivated grassland areas etc.

Future Demands and Challenges

In 2010, the Government Office for Science published “Land Use Futures”,¹ which identified six major factors driving change over the next 50 years in the UK:

- **demographic change** – The Office of National Statistics projects the UK population to increase by about 15 million by 2051, with the largest increases in the South East of England. The number of people living alone is also rising. These trends translate into significant increases in demand for land for housing, transport, water, food, recreation and energy.
- **economic growth and changing global economic conditions** – increased economic growth in the UK could

imply a continuing increase in demand for land for development and services. There are growing concerns about food security³ which could increase pressures for domestic supplies.

- **climate change** – significant increases in renewable energy are projected for climate change mitigation. This may lead to greater competition for land and changes in landscape character. Climate change may affect water levels with more frequent and intense storms and drier summers. The Environment Agency estimates that maintaining flood defences could need an extra £20 million a year to 2035. Adapting to climate change may include reducing development on flood plains.
- **new technologies** – those in farming may reduce environmental impacts while maintaining productivity; information and communications technology with potential effects on commuting patterns; in energy provision.
- **societal preferences and attitudes** – these can conflict e.g. a desire to protect the natural environment vs. preferences for home ownership and car usage, leading to clashing policy responses.
- **the policy and regulatory environment** – how governance responds to different land use pressures and whether or not structures are flexible, will have a profound influence on how effectively land is used in the future.

Managing the Challenges

Existing policy frameworks may help to meet the challenges of the future, although some novel approaches may also be needed. Scenarios are a technique used by many organisations to guide constructive thinking about these challenges by considering potential implications of alternative outcomes (Box 2).

Box 2. Scenarios

Scenarios can be used to describe potential effects of land use changes to accommodate development, energy provision and food demand. They help to guide short term decisions towards longer term goals. Scenarios looking to 2060 developed by Natural England include aspects such as the blurring of urban and rural boundaries, more industrialised agriculture or more local production of food and energy.⁷

Scenario experts indicate that landscape differences between scenarios are even bigger than landscape differences between the more or less extreme climate change predictions, indicating the importance of societal attitudes and policy decisions about landscape and land use. Scenarios can be misinterpreted as predictions of, or plans for, what will happen, e.g. by the media, rather than a means of scoping alternative responses to plausible futures.

Multifunctional Land

A single area of land can be used for many purposes and so can deliver multiple ecosystem services. “Multifunctionality” has been described as an efficient means of meeting future challenges, which balances competing demands for land.¹ Climate change mitigation and adaptation options can be multifunctional. For example, flood alleviation that uses the natural environment rather than human-made structures, can also enhance water quality and biodiversity (Box 3). The current location of some land uses may not be the most effective for delivery of multiple ecosystem services. For example, the siting of some forests has been driven by commercial criteria and this can limit provision of other public benefits such as accessible outdoor recreation for urban communities.¹

Box 3. Upstream Thinking by South West Water (SWW)

For the first time, Ofwat (The Water Services Regulation Authority) has allowed a water company to invest in management of land it does not own. Between 2010 and 2015 SWW will spend £8.8 million working in partnership with others, e.g. the Wildlife Trusts and the Westcountry Rivers Trust, to use the landscape's natural capacity for water storage and filtration. Grants and advice are given to farmers to reduce slurry run-off and fertiliser use. SWW will save money on expensive water treatment to remove sediment, fertilisers and pesticides. Wildlife will also benefit from cleaner rivers.

4,000 hectares of mires on Exmoor and Dartmoor will also be restored. Dry and damaged areas emit carbon whereas intact ones clean water, capture carbon and act as sponges during heavy rainfall, thereby reducing flooding downstream. This is an example of landscape-scale delivery and the ecosystem approach. It will cost SWW customers £0.65 a year each. When surveyed about protecting habitats across the region, customers were on average willing to pay £1.80 a year.

Strategic Spatial Planning and Delivery

The government has proposed fundamental reforms to the planning system in the Localism Bill including the abolition of Regional Spatial Strategies. Commentators such as the Wildlife and Countryside Link (a group of 33 environmental voluntary organisations) and the Planning Officers Society are concerned that voluntary cooperation between local authorities, such as the duty to cooperate in the Localism Bill, may not deal effectively with contentious cross-boundary issues. Landscapes and ecosystems cross administrative boundaries. Communities affect, and are affected by, land use in other areas. For example, water management in upstream areas can impact on flooding and water quality for downstream communities (Box 4). Unless cross-boundary issues are addressed, localism may create or exacerbate fragmentation of landscapes and ecosystems. The National Planning Policy Framework (NPPF) will implement strategic planning at a large spatial scale and play an important role, but it is not yet clear how it will integrate with the NEWP and implementation of the ecosystem approach. A review of other countries' NPPFs has highlighted the consequences of them when driven purely by economics, without any consideration of the natural environment.⁸

Box 4. Case Study – Manor and Castle Green Estate.

Home to around 20,000 people, Manor Estate in Sheffield was once described as Britain's worst estate. The 600 hectares of green spaces were often a dumping ground for burnt-out cars and were seen as a liability rather than an asset. Starting with over £2 million in grant funding, Manor and Castle Development Trust (a local community group) and the Sheffield Wildlife Trust secured the site from cars, produced a surfaced path network, and provided new allotment facilities and opportunities for recreation. With support from the local council, they developed Green Estate Ltd, an organisation that has commercial sales and services to fund the continued management of the green space. The key to success has been local people having a direct say in the management.

A sustainable urban drainage system (a series of basins and ditches to control storm water) has removed the need for below-ground drainage structures and during the 2007 floods it functioned as intended, with the community able to use the green space again within 4-5 days. The creation of new wetland and wildflower habitats has had positive biodiversity benefits.⁹

Land use planning and national infrastructure decisions have long-lasting consequences and as such are priority areas for climate change adaptation, as highlighted by the Adaptation Sub-Committee of the Committee on Climate Change.¹⁰ Coastal erosion and sea level rise (POSTnotes

342 and 363) are among the future challenges to seascapes. Planners and NGOs have suggested the new spatial approaches to marine planning under the Marine and Coastal Act 2009 and the Marine (Scotland) Act 2010 would be useful in land-based planning. A forthcoming POSTnote on Marine Spatial Planning will discuss this in more detail.

Decision-making Scales

The Localism Bill proposes to devolve greater planning powers to local communities. Local knowledge can complement technical knowledge to produce better informed choices about the natural environment and to reduce conflicts.¹¹ If land is to deliver multiple ecosystem services, communities will need easy access to environmental data on a scale that is relevant to them (Box 5). Community groups benefit from the support of local and national government or agency staff, for example, Rights of Way Officers, ecologists and landscape architects. Defra plans to release guidelines for using participatory and deliberative techniques as part of an ecosystem approach.¹²

Box 5. The James Hutton Institute's Virtual Landscape Theatre (VLT)

The VLT is a mobile curved projection screen designed to immerse people in a computer model of their local landscape. It allows them to explore planning options that will affect their environment, e.g. new housing developments or wind turbines, by moving around the virtual world. This is a more inclusive approach than traditional public planning consultations, providing relevant facts in an accessible manner. Anonymous feedback can be gained through voting handsets.¹³

Landscapes are managed on a variety of spatial and time scales. For example, flood risk plans look forward 100 years whereas election and funding cycles are much shorter term. Different organisations also work on different spatial scales. For example, the Environment Agency works on catchments based on the land drained by a single river and its tributaries; Natural England uses 159 distinct National Character Areas; English Heritage emphasises more local scales that match the cultural values of landscapes. These different scales can be confusing but the most appropriate scale will depend on the ecosystem service under consideration. For example, a river catchment is an appropriate scale for a water company in delivering clean water but it is too large for a community developing a neighbourhood plan (which are proposed in the Localism Bill).

In 2010, Natural England released the position statement "All Landscapes Matter", in line with the European Landscape Convention, recognising the value and distinctiveness of all landscapes rather than focusing on protecting the "finest". Landscape Character Assessment Guidance is available to all local authorities and community groups, to realise the potential of their landscapes, whatever their character and condition. National Parks and Areas of Outstanding Natural Beauty provide a useful model of cross-administrative boundary partnerships and integration of professional and community views, as nearly 25% of England and Wales is already covered by these statutory plans.

"Green Infrastructure"

Green Infrastructure (GI), if planned and managed appropriately, can deliver a wide range of social,

environmental and economic benefits (Box 4). There is no widely accepted definition of GI and it is used to describe social and economic as well as ecological initiatives. In the UK, GI usually refers to green spaces in urban areas such as parks, gardens and canals, road and rail corridors. People who live within 500 metres of accessible green space are 24% more likely to meet recommended levels of physical activity.¹⁴ GI is sometimes given a broader scope of reconnecting existing nature areas. The European Commission is developing a strategy for EU-wide GI and suggest it is best implemented through integrated land management and careful strategic spatial planning.

The Common Agricultural Policy (CAP) has recently focussed on the relationship between farming and the environment. There could however be greater focus on delivering multiple benefits, highlighted by the UK government in their response to the European Commission's consultation on the future of the CAP for the period 2014-2020. Agri-environment schemes are usually delivered through agreements with individuals; however ecosystem services, can be enhanced by managing land collaboratively across property ownership boundaries. Improving collaboration will mean finding ways to encourage farmers to act as a community, rather than as individuals.¹⁵ Environmental management is now a fundamental element of many agricultural businesses as a result of agri-environment schemes. Further financial incentives could encourage management of land for the delivery of additional ecosystem services.

Ecological Restoration Zones

Climate change may cause the geographical ranges of wildlife species to shift, although it is difficult to predict exactly what these shifts will be. Continued protection of statutory wildlife sites is important regardless of whether they lose the species for which they are designated, and the current system may need to evolve to accommodate this.⁴ Mixed use landscapes, made up of a mosaic of different habitats, allow more movement of species (POSTnote 300). The Wildlife Trusts "A Living Landscape" and the Royal Society for the Protection of Birds "Futurescapes" are examples of this landscape scale approach.

"Making Space for Nature" recommended Ecological Restoration Zones (ERZs) as part of restoring the natural environment. ERZs would be areas within which existing wildlife sites and the movement of species between them are enhanced and ecosystems are restored. Characteristics of ERZs could vary, but would be formally recognised areas with a shared vision between communities, landowners, local authorities, NGOs and government agencies. The establishment of 12 ERZs over three years requires £27 million that would be accessed through competition.⁴

Integrated Approaches

No single government department is responsible for land use, although most have some impact, including Defra, Communities and Local Government, Energy and Climate Change, Transport and HM Treasury. Innovative policy frameworks may be needed (such as Box 6) to act on

reports such as "Land Use Futures", UK NEA and "Making Space for Nature".^{1,2,4} The NEWP examines how a more integrated approach might be taken, and many NGOs are keen that the new NPPF is integrated with this.¹⁶ The requirement to put landscape and ecosystems into the mainstream of policy across all sectors and levels of government is clear in the ELC, the European Science Foundation's Science Policy Briefing on Landscape, international biodiversity targets and the European Environment Agency's Land Use Assessment.^{17,18,19}

The evidence base for an integrated approach is starting to develop. The Rural Economy and Land Use Programme (RELU) is a collaboration between three research councils with a budget of £24 million between 2004 and 2011 has investigated the social, economic, environmental and technological challenges faced by rural areas.¹⁵ "Living with Environmental Change", a 10 year programme launched in 2008, is a partnership of research councils, government departments and agencies, devolved administrations and local government. Natural England is leading work, to be completed in 2011-12, to define environmental opportunities for all England's landscapes. This integrates landscape character, ecosystem services as well as climate change predictions.

Integration across government departments, however, still remains contentious. In May 2011, in a letter to the Prime Minister, NGOs criticised the lack of environmental protection in the land use planning system reforms and the presumption in favour of new development.

Box 6. Integrated Land Use Policy across the UK

The Scottish government published a Land Use Strategy in March 2011 in compliance with section 57 of the Climate Change (Scotland) Act 2009. It is a strategic framework to deal with the complexity of land use and is thought to be the first of its kind in Europe.²⁰ England and Wales do not have explicit land use policies, although both are considering options for more integrated approaches to managing the natural environment. The Welsh government is developing a new Natural Environment Framework, "A Living Wales", and is considering creating a single environmental delivery body to regulate and manage the environment.

Endnotes

- ¹ The Government Office for Science, 2010, *Foresight Land Use Futures Project*.
- ² *UK National Ecosystem Assessment* <http://uknea.unep-wcmc.org/>
- ³ The Government Office for Science, 2011, *Foresight, The Future of Food and Farming*.
- ⁴ Lawton J *et al*, 2010, *Making Space for Nature*. Report to Defra.
- ⁵ Bramley G *et al*, 2004, *Review of Green Belt Policy in Scotland*. Research Report to Scottish Executive Development Department
- ⁶ <http://www.communities.gov.uk/documents/planningandbuilding/pdf/1803122.pdf>
- ⁷ Creedy JB *et al*, 2009, Natural England Research Report, 031.
- ⁸ Sheate W *et al*, 2011, *A Natural Planning Framework*, Report for the RSPB
- ⁹ http://www.greenestate.org.uk/place_making
- ¹⁰ Adaptation Sub-Committee of the Committee on Climate Change, 2010, *How well prepared is the UK for climate change?* First report.
- ¹¹ Reed M S, 2008, *Biological Conservation* 141:2417-2431.
- ¹² Fish R *et al*, 2011, Defra Project Code: NR0124
- ¹³ <http://www.hutton.ac.uk/learning/exhibits/vlt>
- ¹⁴ Coombes E G *et al*, 2009, *Social Science and Medicine*, 70 (6), 816-822
- ¹⁵ RELU, <http://www.relu.ac.uk/news/briefings/BRIF13/NatureofEngland.pdf>
- ¹⁶ http://www.wcl.org.uk/docs/2011/Link_NPPF_initial_comments_02Mar11.pdf
- ¹⁷ www.esf.org/publications/science-policy-briefings/ESF/COST_SPB41
- ¹⁸ Aichi Biodiversity Targets <http://www.cbd.int/sp/targets/>
- ¹⁹ EEA, 2010, <http://www.eea.europa.eu/soer/europe/land-use>
- ²⁰ The Scottish Government, 2011, *Getting the best from our land-A land use strategy for Scotland*.