

The Squeezed Middle Debate

Addressing conflicting demands on the use of intermediate quality land in Scotland













Located between Scotland's best farmland in the lowlands and its wet moorlands and high mountains, is the intermediate land which comprises a challenging environment in terms of future land use. This land use zone is subject to many different demands which together are producing a 'squeeze'. Those who own and manage it face multiple choices – it can support relatively intensive livestock farming and limited arable cropping; it often has high potential for tree growth, especially conifers; it contains some relatively intensively managed sport shooting land, especially grouse moors; and increasingly, some areas are managed for conservation or landscape protection. This area is also living space for diverse rural communities.

This 'Squeezed Middle' land use zone is usually multifunctional and delivers many other benefits to society, such as provision of clean water, flood protection and high-quality landscapes. Different stakeholder groups are affected by land use choices, leading to disagreement and conflict. The Squeezed Middle's land use composition and therefore the associated conflicts vary markedly from place to place. How can this land best contribute to Scotland's aspiration for sustainable economic growth?



Glenlivet Morayshire: quintessential Squeezed Middle

What comprises the Squeezed Middle?

In terms of the Macaulay Land Capability for Agriculture (LCA) classification, the Squeezed Middle can be considered as LCA Class 3.2 to LCA Class 6.1; that is all rural land excluding prime agricultural land and the poorest quality moors and hills. It forms a ribbon around Scotland's higher ground, includes much of the central belt, the Borders, SW Scotland the NE lowlands, the limited better crofting land and extends along the straths of the eastward flowing rivers.



Figure 1 The Squeezed Middle (in red) as defined by LCA classes 3.2–6.1 inclusive

There is plenty of evidence that actual land use and the underlying potential often differ from place to place. Some land is managed with a light touch, or managed for uses other than that for which it is technically most suited. It is this range of options for the way in which land is used that differentiates the Squeezed Middle from the better quality agricultural land and environmentally constrained hill and mountain land on either side of it.

Multifunctional land use and multiple benefits

The choices made by land managers can be seen as a function of five Ps: prices; policies; power; path dependencies; and preferences. *Prices* convey signals to those who derive a living from the land. *Policies* are usually designed to correct for market failures and redistribute economic resources. However, some would argue that policies can be a function of inequalities of *power* amongst those seeking public support. Further 'history matters' and past events, such as a world war can lead to a particular type of land use, for example forestry plantations. This is termed *path dependency*. Finally, where there are wealthy individuals and certain land uses have a distinct social cachet, or where local tradition remains a key influence, individual *preferences* may be critical in land use outcomes.

Lately, many in the policy community have used the term 'ecosystem services' to identify the multiple benefits associated with rural land use. Popularised by the global Millennium Ecosystem Assessment (MA) (2005) and put into a UK context by the National Ecosystem Assessment (NEA) (2011), it provides a framework to explore the multiple values associated with particular land use systems, not all of which are economic. We can use this concept in relation to the Squeezed Middle in Scotland to explore whether the current land use mix meets societal demands or if changes would enhance societal benefits.

Box 1 Ecosystem services

Four types of ecosystem service were identified by the MA:

Supporting services, such as nutrient cycling, water cycling and soil formation. These underpin the provision of the other 'service' categories.

Provisioning services, such as food, fibre, fuel and water.

Regulating services, such as climate regulation, water purification and flood protection.

Cultural services, such as education, recreation, landscape amenity value.

The multifunctional characteristics of the Squeezed Middle mean it is important for a wide range of different ecosystem services. The financial value of outputs vary greatly dependent on the nature of activity (commodity production for the agri-food supply chain, direct sales of added value products to the public and provision of recreational activity such as field sports). Other important services, such as landscape amenity and using soils and woodland as a carbon sinks are more difficult to value in financial terms.

We need to think about maintaining ecosystem service delivery beyond the present. Sir John Beddington, UK Government Chief Scientific Adviser, has talked about the possibility of a perfect storm of food, water and energy shortages in a world of nine billion people within the next 30 years. How should Scotland's Squeezed Middle land best respond to this? What changes in policy mix and practice are needed to better fulfil this challenge and meet the Scottish Government's aims?

The policy background

For most rural land use, the outcomes on the ground are a function of markets, policy influences, social and political power and land manager preferences. But, in the Squeezed Middle, policies are particularly important, not least because of market failures in recognising the wider societal benefits from the delivery of public goods (i.e. ecosystem services). Policies may encourage one land use over another, not always fully recognising their multiple costs and benefits as the largescale afforestation of the Flow Country in the 1980s showed. Other policies, such as the Less Favoured Areas Scheme for Scotland (LFASS) have been adjusted to try to better meet contemporary demands. Past overstocking of livestock has been reduced by a shift from headage to area payments. Currently, there is a major debate about where the Scottish Government's aspiration of increased woodland cover should be located.

Until fairly recently, policies affecting rural land managers mainly related to farming or forestry and, after 1981, wildlife conservation. Now there is a more crowded policy field with climate change and renewable energy policies having potential to influence land use outcomes. The use of land for storing carbon and generating renewable energy were not on the agenda when the basic building blocks of post-war farm and forest policies were laid down. Who could have anticipated a Land Use Strategy being part of a Climate Change Act?

We live in a world where policy is framed at global scale (as in the Kyoto Protocol for climate change), at European scale (the CAP and various Directives), or at UK level (the setting of renewables support through feed-in tariffs), then shaped and implemented for Scotland. This multi-level governance can create further problems for Scotland's Squeezed Middle. Proposed CAP greening measures may have undesirable consequences on livestock farms in the Squeezed Middle. The threat, in Westminster, to reduce the on-shore wind support will impact adversely on Scotland's renewable energy targets. Getting the right solution with complex multi-level governance is an enormous challenge.

Why might we think the mix of uses is not achieving its full potential?

There are many signals that neither the policy community nor land managers are happy with the current situation in the Squeezed Middle. A long period of poor farm product prices generated destocking and community fragility as detailed in SAC's Retreat from the Hills (2008). There is major dissent from farmers about forestry expansion aspirations. Nature conservation objectives are sometimes at odds with existing land management practices. Renewable energy targets can also be a source of conflict.

In this section we flag some of the more difficult challenges found in the Squeezed Middle.

Low incomes- high subsidy dependency in farming

For many land managers in the Squeezed Middle incomes have been low for many years. Net farm incomes of hill and upland farmers have consistently been exceeded by the combined subsidies of LFASS and the Single Farm Payment.

Table 1 Support payments as a % of net farm income		
	2001-02 ¹	2010-11
Lowland Cattle and Sheep	179	128
Specialist Beef (LFA)	213	162
Cattle and Sheep (LFA)	311	147
Specialist Sheep (LFA)	1502	138
All farms	256	109

¹2001-02 shows 'direct subsidy'. N.B. this year the income was very low and the % subsidy was exceptionally high. Source: Scottish Government, 2002; 2012

Overcoming farmer antipathy to tree planting

The Independent Panel on Forestry in England (2012) reported very recently that 'Total (market and non-market) benefits (of the state forest) are



Figure 2 Overlap between Squeezed Middle (red) and LCA classes 3.2–6.1 and forest cover in North-east Scotland

therefore around six times as valuable as the £72 million spent annually to sustain the public forest estate, and around 20 times greater than the £20 million of net public investment.' Scottish upland farmers feel threatened by tree planting, and seem unwilling to recognise benefits and work towards forest expansion (RSE 2011).

Reducing diffuse pollution and better managing water resources

Land use pressures have been implicated in producing reduced water quality. Clearfell leads to sediment surges in watercourses. Diffuse pollution from livestock, including waterings, fertiliser application and badly placed feeding rings can adversely affect water quality. Good management practice on floodplains and wetlands can create benefits and reduce flood risk to settlements downstream. Catchment planning and making use of Scottish Rural Development Programme (SRDP) funded measures can help, but there remains a long way to go.

Reducing adverse impacts of deer

Deer numbers have increased, partly because of new forestry and partly because of mild winters and reduced mortality. Red deer have a strong place in the iconography and land use of the high hills. Their movement down the slope into the Squeezed Middle is rarely welcomed and often problematic. Marauding deer are a problem for farming, forestry and nature conservation and pose a major road traffic risk.

Sustaining viable grouse moors

There are many highly productive grouse moors on 'better quality' uplands particularly in eastern Scotland. The maintenance of high grouse numbers provides high-value driven grouse shooting but managing disease and predation, creates challenges. Reducing predator numbers is a deeply contentious issue in the eyes of regulators and the general public.



Grouse moor, farming and forestry: Corgarff Aberdeenshire

Reducing fragmentation of habitat networks

Nature rarely sits entirely comfortably within the pattern of land ownership. Fragmentation of habitats has long been a problem that compromises biodiversity. The creation of better connectivity in habitat networks can enhance their quality but financial incentives usually favour applications from single landowners.

Understanding the impacts of climate change

Climate change will have complex effects on land use. In the medium term, we can anticipate a reduction in climatic limitations to plant growth and significant areas of land may attain a higher LCA class. If increased droughtiness prevails elsewhere, the relative value for Scotland's Squeezed Middle for food production will increase. How far food security arguments should avert other possible development strategies should depend on tradeoffs with desired policy outcomes, for example in climate change and energy.

Accommodating renewable energy production

On-shore wind remains a contentious renewable policy as some challenge the viability of any strategy too dependent on such an intermittent source of energy. Bioenergy and hydro schemes have as yet only provided a minor resource. Whilst a general presumption against development on peat protects many wet moorlands and higher areas, and landscape designations protect other areas, the pressure for development is particularly strongly felt in the Squeezed Middle. Contention is particularly great in commuting areas where people challenge the industrialisation of the landscape.



Renewable Energy, Southern Uplands

What are the key research needs to provide better evidence-based policy?

Measuring externalities/ecosystem service values

Behind the potentially bewildering array of policies, we can identify an overarching challenge: we do not know, area by area, the value of all ecosystem services or how their values might be enhanced by changes in practice. Characterisation of ecosystem assets and the identification of their multiple beneficiaries, both local and in urban areas, will inform decision making in policy and practice.

The metrics for comparing the range of benefits across different land uses are incomplete and the science of ecosystem service valuation still in its infancy. In essence, land use decisions are still being driven by policy choices and their associated instruments decided upon without any real reference to the full value of the ecosystem services provided. Carbon values are potentially enormous and if DEFRA/DECC values were paid to landowners for sequestration, there might be less antipathy to tree planting. In many cases, these decisions are based upon historic precedents that were influenced by very different states of the rural economy and world markets in the past.

Stacking ecosystem service delivery

It seems likely that we can enhance public benefits from land use by better understanding the scope for multiple benefits. As an example, buffer strips along field boundaries can enhance water quality, but can also be carbon sinks if trees are planted or wildlife corridors or recreational pathways. If the policy challenge is only to secure water quality enhancement, these other stacked benefits are ignored. Agro-forestry (in different forms in different places) may have a role in stacking ecosystem service delivery. In this multifunctional land use zone we must also be better able to assess ecosystem service trade-offs.

Creating the institutional architecture to deliver change

Locally, land use decisions are not made to optimise national outcomes but to satisfy land managers' predilections. Greater congruence can be sought by using policy to nudge behaviour, where the two seem most out of kilter. People talk about policy silos; to a significant degree they still exist, in spite of some integrative possibilities under instruments such as the SRDP. The Land Use Strategy provides a rhetorical foundation for integrative action, but there is a need to think about how best to move from principles to good practice and at what scale: catchments; landscape tracts; or local authority areas?

The Land Use Strategy is a product of the Climate Change (Scotland) Act 2009. Dovetailing policies for climate change and land use, and balancing food and energy security requires strategic choices. Amongst these, the need to decarbonise space heating in Scotland has been recognised, which ought to stimulate wood energy markets, particularly in rural areas where wood is relatively abundant.

Implementing PES

There has been a great deal of interest of late in the idea of payments for environmental services (PES). These are voluntary schemes whereby contracts are made between purchasers of environmental services and private bodies. More generally, interest in PES drives us to explore the scope for new market creation with respect to the many environmental values found in the land of the Squeezed Middle. Policy may at times need to regulate; but it can also enable through incentives and create a seedbed on which to explore new possibilities.

Different places, different options

The diverse interaction of the five Ps in different parts of Scotland's Squeezed Middle means that although there is a discernible set of pressures, they will operate with different intensity in different places. There is no onesize-fits-all solution. Adjacent to urban areas there is often intense pressure for new housing or infrastructure, with the middle not having the planning protection given to prime agricultural land. This same land faces high demands for recreation and accessible 'greenspace', for example in the Central Scotland Green Network. Flood mitigation can place demands for new land uses on floodplains in the uplands to protect downstream communities. Carbon sequestration through land uses creates more new demands. These demands for recreational space, carbon storage and flood management are different from those for the productive uses. They rarely generate income directly. They can

appear as impositions on land managers and working communities and need to be introduced by means of well-designed, supportive and place-sensitive policies.

It seems likely that enhancing ecosystem services delivery in the Squeezed Middle is compromised by a mixture of path dependencies in policy and practice and entrenched positions by different stakeholders. Getting a better balance and enhanced social and economic value from the mixed and multifunctional uses of the land in the Squeezed Middle ought to be possible. To do so requires a partnership between central and local government, their agencies, the third sector, researchers and communities of practice on the ground.



Aberdeen Craigiebuckler Aberdeen AB15 8QH Scotland UK

Dundee Invergowrie Dundee DD2 5DA Scotland UK

Tel: +44 (0)844 928 5428 Fax: +44 (0)844 928 5429

> info@hutton.ac.uk www.hutton.ac.uk

/JamesHuttonInst

A Scottish charitable company limited by guarantee. Registered in Scotland No SC374831 Registered office: The James Hutton Institute, Invergowrie, Dundee, DD2 5DA. Charity No SC041796