

Online Resource 1 - Major land use drivers in Scotland

Societal

Social justice and increased participative approach – Article 6 of the United Nations Economic Commission for Europe (UNECE) Aarhus Convention focuses on empowerment and public/community participation in, and awareness of, land management processes. Combining local and expert knowledge is increasingly recognized as an important step in land use decision-making; stakeholder engagement is usually now an intrinsic part of the process (Reed et al. 2011). As an example, the Community Empowerment (Scotland) Act 2015 gives community bodies the possibility to have more control over land and buildings and strengthens their voices in decisions about public services (Scottish Government, 2015b).

Land ownership and land use challenges – In contrast to many other countries, Scotland has no restriction on who can buy land or on the quantity of land purchased (Glass et al. 2013), and has the most concentrated pattern of private landownership in Europe (Lorimer 2000; Cahill 2001; Wightman 2001) due to historic factors such as feudalism, succession laws, fiscal policies and agricultural support. It is estimated that 432 landowners account for 50% of the privately-owned land in Scotland (Wightman, 2013). The land reform agenda has progressed considerably in Scotland in recent years, with the passage of the 2003 and 2016 Land Reform (Scotland) Acts, which place an increasing emphasis on all landowners to enable local development and deliver a wider range of public benefits.

While private landownership continues to dominate Scotland, a gradual diversification of land ownership and management patterns has occurred, driven in the first half of the 20th century by state acquisitions of land and from the 1970s and 80s onwards by conservation NGOs and community bodies acquiring land (McMorran 2016). Community landownership has experienced particular growth since 2000, including some major purchases or ‘buyouts’ of private estates, sometimes jointly with environmental organisations (Thomson et al. 2016). Such purchases have often occurred where there have been conflicts between the local communities and landowners relating to development and land management (e.g. landowners perceived as restricting local development or access to land for housing, woodland recreation versus maintaining high deer numbers for sporting purposes, or the level of community involvement in land-use decision making). The debate about land use and property rights

remains uniquely charged, both politically and socially (Reid 2015; Land Reform Review Group 2014).

Technological

Improvement of existing roads and new transport projects such as rail networks, bus and ferry links as well as the delivery of onshore and offshore grid connections, will have an impact on land use (e.g. impact of actual construction) as well as providing opportunities and links for rural areas (e.g. living standards and sustainable rural economies) (Skerrat et al., 2016). In particular, high-speed broadband is integral to the social and economic development of rural areas (Scottish Government, 2012). But whilst connectivity in urban parts of Scotland is becoming faster and faster, (Skerrat et al., 2016) much of rural Scotland still suffers from broadband and mobile 'twilight zones'.

Economic

Brexit - It is widely acknowledged that the EU has had a profound effect upon UK environmental policy, both through the Single Market and environmental regulation, and policies in areas such as agriculture, climate change, energy and fisheries (Skerrat et al. 2016; Burns et al. 2016). Whilst Brexit poses significant challenges for rural Scotland's agriculture and land-based businesses (e.g. uncertainties over post Brexit funding mechanisms or trade arrangements), it also provides an opportunity to reflect and reassess objectives and instruments to redesign them to better reflect Scottish preferences and conditions (Bird, 2017). However, this requires preparatory thinking to indicate the preferred level of direction when the time comes.

Environmental

Climate Change - Scotland is rich in natural resources and associated ecosystem services, but potentially sensitive to both the adverse and beneficial impacts of climate change. For example, the current climate of many parts of the country is marginal for agriculture (Brown et al. 2011) and important components of Scotland's biodiversity are at the margins of their climate suitability (Trivedi et al. 2008). Recent scenario studies for 2050 in Scotland predict that flooding will increase in all regions due to an increase in temperature; that climate change will lead to a more homogenous landscape and an increase in intensive farming; that forests will be replaced by agriculture; and that specific species will migrate either further north or to higher altitudes as the climate becomes wetter and warmer (Holman et al. 2016). It is therefore

important for stakeholders to work together across the sectors now to prepare for changes and develop suitable adaptation strategies.

Policy

Environmental Policy – Biodiversity loss and the often unsustainable nature of economic-based approaches to natural resource management have driven a shift towards an ecosystem approach (SNH 2010), multi-functionality (Midgely et al. 2008) and land use integration (Stockdale and Barker, 2009). Examples include the Scottish Government's Land Use Strategy, a requirement of the Climate Change (Scotland) Act (2009) acting as an overarching framework for land use policies in Scotland (Scottish Government 2016); and the Scottish Environment Protection Agency's River Basin Management Plans (Scottish Government 2015a), which increasingly foster joined-up thinking between regions.

References

Bird J (2017) Scotland's Rural Policy Options post-2019. Scottish Rural Policy Centre Briefing. Edinburgh: Scotland's Rural College
https://www.sruc.ac.uk/downloads/file/3427/scotlands_rural_policy_options_post-2019
(Accessed 20 October 2017)

Burns CA, Jordan V, Gravey N, Berny S, Bulmer N, Carter R, Cowell J, Dutton B, Moore S, Oberthür S, Owens T, Rayner J, Scott and B Stewart (2016) The EU Referendum and the UK Environment: An Expert Review. How has EU membership affected the UK and what might change in the event of a vote to Remain or Leave?
https://www.researchgate.net/publication/301293227_The_EU_Referendum_and_the_UK_Environment_An_Expert_Review (Accessed 20 October 2017)

Brown I, Poggio L, Gimona A, Castellazzi M (2011) Climate change, drought risk and land capability for agriculture: implications for land use in Scotland. *Reg Environ Chang* 11(3):503–518. [doi:10.1007/s10113-010-0163-z](https://doi.org/10.1007/s10113-010-0163-z)

Cahill K (2001) Who owns Britain: the hidden facts behind land ownership in the UK and Ireland. Cannongate, Edinburgh. 464 pp.

Glass J, Price MF, Warren CR, Scott AJ (2013) *Lairds, Land and Sustainability – Scottish Perspective on Upland Management*. Edinburgh University Press.

Land Reform Review Group (2014) *The Land of Scotland and the Common Good*. Report of the Land Reform Review Group. Land Reform Review Group Secretariat, Edinburgh 2014
<http://www.gov.scot/Resource/0045/00451087.pdf> (Accessed 20 October 2017)

Holman I, Harrison P, Metzger MJ (2016) Cross-sectoral impacts of climate and socio-economic change in Scotland: implications for adaptation policy. *Regional Environmental Change* 16:97-109 [doi:10.1007/s10113-014-0679-8](https://doi.org/10.1007/s10113-014-0679-8)

Lorimer H (2000) Guns Game and Grandee: The Cultural Politics of Deerstalking in the Scottish Highlands. *Cultural Geographies* 7:403-431 [doi: 10.1177/096746080000700402](https://doi.org/10.1177/096746080000700402)

McMorran R (2016) Socioeconomic and environmental outcomes from different landownership models in rural Scotland. In: Skerratt S, Atterton J, McCracken D, McMorran R and Thomson S (2016), *Rural Scotland in Focus*. Edinburgh: Scotland's Rural College.
https://www.sruc.ac.uk/info/120428/rural_scotland_in_focus/1735/2016_rural_scotland_in_focus_report (Accessed 20 October 2017)

Midgley A, Williams F, Slee B, Renwick A (2008) *Primary Land-Based Business Study*. Scottish Agricultural College, Edinburgh.
www.sruc.ac.uk/download/downloads/id/79/primary_land-based_business_study
(Accessed 20 October 2017)

Reid A (2015). *Land Reform in Scotland*. Scottish Parliamentary Information Centre (SPICe), Edinburgh.
http://www.parliament.scot/ResearchBriefingsAndFactsheets/S4/SB_15-28_Land_Reform_in_Scotland.pdf (Accessed 20 October 2017)

Scottish Government (2012) *Scotland Performs*.
<http://www.gov.scot/Resource/0049/00497339.pdf> . (Accessed 20 October 2017)

Scottish Government (2015b) *Community Empowerment (Scotland) Act 2015*.
http://www.legislation.gov.uk/asp/2015/6/pdfs/asp_20150006_en.pdf (Accessed 20 October 2017)

Scottish Government (2016) Getting the best from our land – A land use strategy for Scotland 2016-2021. <http://www.gov.scot/Resource/0049/00497086.pdf> (Accessed 20 October 2017)

Scottish Natural Heritage (2010) Sustaining Nature's Services – Adopting an Ecosystem Approach, SNH, Edinburgh.
<http://www.snh.gov.uk/docs/C334569.pdf> (Accessed 20 October 2017)

Thomson S, Moxey A, Wightman A, McKee A, Miller D, Brodie E, Glass J, Hopkins J, Mathews K, Thomson K, Mc Morran R, Bryce R (2016) The impact of diversity of ownership scale on social, economic and environmental outcomes: Exploration and case studies, Final Report to the Scottish Government
<http://www.gov.scot/Resource/0050/00502355.pdf> (Accessed 20 October 2017)

Skerratt S, Atterton J, McCracken D, McMorran R, Thomson S, (2016), Rural Scotland in Focus. Edinburgh: Scotland's Rural College
http://www.sruc.ac.uk/downloads/download/828/2014_rural_scotland_in_focus_report
(Accessed 20 October 2017)

Stockdale A, Barker A (2009) Sustainability and the multifunctional landscape: An assessment of approaches to planning and management in the Cairngorms National Park. Journal of Land Use Policy 26: 479-492 <http://dx.doi.org/10.1016/j.landusepol.2008.07.001>

Trivedi MR, Morecroft MD, Berry PM, Dawson TP (2008) Potential effects of climate change on plant communities in three montane nature reserves in Scotland UK. Biolog Conserv 141(6):1665–1675. [doi:10.1016/j.biocon.2008.04.008](https://doi.org/10.1016/j.biocon.2008.04.008)

Wightman A (2001) Land Reform Draft Bill Part II – Community Right-to-Buy. Caledonia Briefing No. 3. Caledonia Centre for Social Development.
http://www.andywightman.com/briefings/docs/briefing_3.pdf (Accessed 20 October 2017)

Wightman A (2013) The Poor Had No Lawyers: Who Owns Scotland and How They Got it. Birlinn, Edinburgh. 448 pp.