

Integrated land use: exploring and testing issues surrounding farming, forests and energy in the Highlands and Islands

Supervisors: Melanie Smith (Director of Studies), Inverness College UHI
melanie.smith@inverness.uhi.ac.uk)

Martin Price, Perth College UHI (martin.price@perth.uhi.ac.uk);

Rob Mc Morran, Perth College UHI (Robert.mcmorran@perth.uhi.ac.uk)

Host Academic Partner and Centre: Inverness College UHI

Research area and background

In the recently published Land Use Strategy for Scotland, the Scottish Government (2011) recognises that a more integrated approach to land use management is essential for a more productive Scotland. The main thrust of this strategy is to promote integrated policy-making in public bodies, such as SEPA, SNH and the Forestry Commission (FC), to ensure sustainable land use. However, while there has been considerable progress in recognising the need for this approach at government level, the reality in terms of implementation remains challenging. The challenges are exemplified when considering the further integration of farming and forestry, particularly in relation to biomass energy and especially in the context of the Highlands and Islands. Furthermore, there is limited consideration of the way in which ecosystem values can be incorporated into an integrated land use approach.

The Scottish Forestry Strategy (Scottish Government 2006) envisages a widespread move towards a multifunctional approach to forestry management, and the continued expansion of the forest resource from an existing 17% to 25% by 2050. Forestry expansion and sustainable management offers considerable potential to deliver a range of ecosystem services, including carbon absorption, renewable energy, recreation, and biodiversity. The future development of Scotland's forests also offers potential in terms of delivering sustainable rural development, enhancing habitats and landscapes and providing a variety of recreational and tourism resources.

In terms of availability and suitability, lower-quality agricultural land represents the most significant land area in terms of future opportunities for forest expansion in Scotland (Towers *et al.*, 2006). However, there is an apparent resistance to the use of this land for forestry on the part of Scottish farmers (Lloyd *et al.*, 1996; Warren, 2009) which may be related to a lack of familiarity with forestry activities and an over-arching focus within agriculture (and agricultural policies) on being nationally self-sufficient in foodstuffs (Lawrence *et al.*, 2010). This ingrained resistance to forestry was reinforced from the 1970s to 1990s due to the rapid expansion of forestry in upland areas during this period at the expense of upland sheep farms (Warren, 2009).

Recent decades have witnessed greater policy and grant support for integrating farming and forestry,¹ and the level of tree planting on farm holdings has correspondingly increased. Emerging biomass and biofuel markets have also increased the attractiveness of high-productivity short rotation forestry to farmers, through providing a high value market for potential harvests (Towers *et al.*, 2006). Woodfuel represents a growing market in the Scottish Highlands and Islands, and a clear avenue to support rural development and farm-level business activities (Anderson 2006; Mc Morran and Milne 2009). However, the potential and mechanisms for developing these markets, especially at local and district level, are still poorly understood. Expansion of farm-level forestry therefore offers a range of potentially significant benefits, including increased land use integration and multifunctionality, improved farm-level biodiversity, and provision of opportunities for rural business development and employment (Slee 2007; Mc Morran 2008).

Previous studies of farmers' attitudes in Scotland have focused primarily on their attitudes to woodland planting and grants. Past studies have also generally failed to include the views of farm tenants

¹ The farm woodland premium scheme in 1992; the Whole Farm Review Scheme, 2004 and subsequent follow on grant schemes, particularly the Scottish Rural Development Programme have provided additional economic incentives for farmers to engage in tree planting and forestry management.

or adequately account for regional variation in farmer attitudes (Lawrence *et al.*, 2010). Landowners make decisions within a wider context of land use options and incentives, and these decisions are likely to be increasingly influenced by recognition of ecosystem value (UK National Ecosystem Assessment, 2011).

Proposed research questions

To address the issues outlined above, the following research questions would be addressed:

- 1) How do land managers currently perceive forestry- and woodland-related 'opportunities'; and how do current attitudes compare to previous studies?
- 2) What are the barriers (perceived or real) to forest energy development and how could these be addressed?
- 3) How would an ecosystem services approach be developed and implemented to further farm-forestry integration?
- 4) How well are existing processes for encouraging farm woodland expansion working, and what are the most significant future opportunities?

Proposed project methodology

To address the above research questions, an interdisciplinary approach is proposed, which integrates literature review, questionnaire surveys, interviews and GIS /remote sensing analysis. It is suggested that survey questionnaires be developed and conducted in three distinct regions of the Highlands and Islands (potentially: Caithness and Sutherland; Cairngorms; and Argyll). Crofters should, where possible, be included within survey samples. Typology development across respondents (to classify attitudinal 'types') using Q methodology or general cluster analysis is suggested as a potential approach to data analysis. To explore the issues raised in greater depth, it is also proposed that a small number (2-4) of focused case studies, incorporating documentary review and semi-structured interviews, be carried out on existing initiatives designed to encourage cooperative farm-forestry integration between farmers and in conjunction with estate owners and farm tenants. The methodology would also incorporate GIS analysis to assess the potential for forest energy development in relation to energy demand at local, district and national scales. It could also be used to assess spatial aspects of cooperative farm forestry initiatives or to carry out spatial analysis relating to farm-forestry-energy at a national level.

Research impact

The proposed research will identify the attitudes of land managers to woodland expansion in the wider land use and ecosystem services context. It will be highly relevant with respect to directing sustainable growth at local and regional levels in the Highlands and Islands in the rural industries sector. There is considerable potential for innovation and job creation in a range of potential markets linked to sustainably managed forestry, including energy, tourism, natural products and agroforestry. The early identification of improved mechanisms to integrate farming and forestry in the Highlands and Islands would give the region the capacity to lead in newly emerging markets. It could also provide a model for implementation in other regions and countries with similar issues.

Details of relevant previous work and experience of supervisors

Melanie Smith has undertaken research in long-term ecological change, forest and energy management and forests and health, and co-supervised research projects with the Agronomy Institute, Orkney. She has been involved in NPP Northern Woodheat and the current COST Action FP0902 in forest energy. She has worked on projects with the Woodland Trust, SNH, SEPA, GWCT, RAFTS and FC.

Martin Price considered the development and implementation of policies for mountain forests in the Colorado Rockies and Swiss Alps for his PhD. From 1996-2000, he led a Task Force on forests and sustainable mountain development for the International Union of Forest Research Organizations (IUFRO) (Price and Butt, 2000). He is currently coordinating the preparation of a global report on mountain forests for the Swiss Agency for Development and Cooperation.

Rob Mc Morran did his PhD on multifunctional forestry management and policy in the Cairngorms National Park. He has also worked as a consultant to Forestry Commission Scotland on a study on the opportunities for forestry in Caithness and Sutherland.