

Environment and Sustainability Committee

Inquiry into Sustainable Land Management in Wales – Response from the Countryside and Community Research Institute (CCRI)

Background – who we are and what we do

1. The CCRI is the largest specialist rural research centre in the UK, having expertise in all aspects of social science and economic research in policy and planning for the countryside and the environment of the UK, Europe and further afield. Our research is organized across four main themes:

- Food, food security and Bio–security
- Economy and society in a changing climate
- Agriculture, Ecosystems and Shared Resources
- Heritage, Landscape and Rural Development.

2. The CCRI has a strong record of academic and financial achievement. It earns a regular annual income of around £1 million from research projects and grants. Some 85% of the CCRI’s research is considered, through peer review, to be of international standing, and we are significant consortium partners in seven EU–funded framework projects at present, as well as undertaking work for UK governments and agencies, the OECD, and governments in other EU member states. A key feature of our work is that we actively seek involvement in projects and initiatives with wider relevance to practitioners and policy makers, so that the results of our work have tangible impacts on society.

3. Our response to the inquiry is based upon our research findings from recent and ongoing projects and initiatives, including some work in Wales and some with collaborating partners based in Wales, such as Environment Systems, with whom we have shared this opportunity to provide evidence. As a result, we cover just four inter–related questions from the full list provided by the call for evidence. We deal with each question in turn, below.

Q1. How to define the key ecosystems and ecosystem services in a way that makes sense for Wales

4. The CCRI welcomes the chosen approach of the Welsh Government in looking at sustainable management via a focus upon the role of *ecosystems and ecosystem services (ES)*. In thereby taking a territorial approach, rather than a sectoral one, the WG apparently recognises the importance of an integrated approach in which it is the systemic consequences of actions in multiple sectors, by multiple actors, which will determine the long-term sustainability of land management. Two issues are especially important here.

5. One important requirement for defining key ecosystems and ecosystem services is ensuring a full understanding of how the landscape of Wales contributes to ecosystem service delivery and acquiring data and other information that enables this assessment to be made. All land contributes to the delivery of ecosystem services in some way, depending largely on the specific land cover or crop, the soil type underneath, the position of the land in the landscape (for example whether on a steep slope or on a flood plain) and how and by whom the land is managed, for what purposes. A lot of relevant data currently exists, but the understanding of some of the main mechanisms linking natural capital to ecosystems services delivery remains poor. For example whilst the role of broadleaved woodland in locking in atmospheric carbon is well known, the role of peat bogs and other upland vegetation in regulating water flow in the catchment and preventing flooding downstream is less clear.

6. Whilst they are perhaps not as well-developed within ecosystem services thinking as other types of service, our research has shown that it is the social and cultural services provided by land management, as well as the impact of management upon social and cultural assets and the ways in which these assets in turn shape management trends, that is often critical to socio-ecological system resilience (i.e. the ability of sustainable land management systems to evolve and adapt to unanticipated changes). Work by the CCRI under the Valuing Nature Network project (Jones *et al*/ 2012) highlighted the need for approaches that reveal the connections between society and ecosystems, to find out what people value and why, so that this value can be sustained. Some of these connections are direct and explicit such as commercial land management to produce

food and fibre, but others are more intangible, such as the cultural and even strong emotional relationships that people have with particular landscapes and areas.

7. The cultural dimension of the Ecosystem Services evaluation framework is the least developed of the services, and also the most contested but, we would argue its relevance to many aspects of sustainable land management. Some of CCRI's work (for example around the Severn estuary; on Exmoor; and supporting one of the Pilot areas within Defra's Catchment-based Approach programme) is designed to identify how a 'cultural services' concept can usefully be developed to enable a fuller and more rounded consideration of the roles that culture and personal identity play in determining the value of nature to human society; as well as ways of measuring and working with cultural and social values, without necessarily monetising them – for example, including *social network analysis* to highlight how groups of actors communicate and learn from each other. It is especially important in some areas to recognize *knowledge systems* as a cultural service that can contribute to improved understanding of environmental challenges such as flood alleviation and improving water quality. The significance of *art and creative activities* in developing and enhancing a sense of place is also being explored within CCRI research focused around the cultural service attributes of the lower river Severn landscapes.

8. 'Making sense' of ecosystem services is also important, so that communities and actors on the ground can consider how best to realise their potential. Pilot work under the Payment for Ecosystem Services (PES) framework for Defra, and within Exmoor National Park (Short and Dwyer, 2012) has highlighted that farmers can quite readily understand the concept of ecosystem services, possibly because they work already with dynamic and inter-related concepts such as cropping rotations. Also, because within the framework, provisioning services such as food and fuel production are clearly identified alongside other services, farmers' key role in service provision is clearly acknowledged – something that has not always been the case in respect of other environmental planning approaches. Communities can also see how the services relate to them by considering key roles such as alleviating flooding or providing clean drinking water. Nevertheless, it is important to explicitly provide space within ES planning, in order for such discussions to take place (see also our third question response).

Q.2 What incentives can we provide land managers to develop sustainable practices, and in particular, are there any new sources of investment we can attract to support these?

9. The recent research undertaken by CCRI suggests that a range of incentives and other mechanisms can be used to promote changes in farmer behaviour towards more sustainable practices. The role of agri-environment schemes in this respect is of course important and some of our work for the WG shows that they are widely known and have been well-accessed by the farming community in Wales, over the past decade. However, some farmers do not join the schemes; their reasons for not joining are varied but are often linked to their particular farm business and farm family plans, pathways and trajectories (See Ingram et al 2012). Our research suggested that participation in Tir Gofal (TG) on family farms could be traced back to the family's long-term motivations for farm continuity, and depended upon the scheme's consistency with the specific dynamic farm development pathways that farmers evolve in order to ensure their continuity. Thus it is important for incentive schemes to be designed with a good understanding of trends in farm business development, both current and future, to maximise the scope for synergies between what schemes are seeking to achieve and what farmers are likely to be planning.

10. Most agri-environment schemes focus incentives upon prescribed management practices – yet there are acknowledged shortcomings in this approach, if used alone (Dwyer, 2013). The WG has been innovative in using incentives in unconventional ways within Glastir, as shown by CCRI and Commons Vision's evaluation of the CDO officers' role (Brackenbury and Short 2012). This study demonstrated the value of funding advice and support for the farming community as a key element in changing behaviour and adopting new ideas. The development of landscape-scale initiatives, which is gathering increasing credibility in policy circles, requires land managers (and other interests) to work together in a collaborative way. CCRI research for both CCW and WG shows that these initiatives can have a significant impact, but they also have a real need for incentives to support co-ordination activity and advice, as well as land management payments.

11. Recent CCRI work for Natural England has highlighted the central role of facilitation as the most effective means of tackling a wide range of issues in sustainable land

management (Mills, Short and Courtney 2012). And this process is not just about knowledge transfer from environmental scientists to farmers: transfer in the opposite direction is also critical to securing lasting beneficial changes in management. The CCRI is currently evaluating the Hill Farm Training Programme operating in Cumbria and Dartmoor, where farmers act as trainers for conservation professionals, covering a wide range of issues associated with upland farming. About 80 people have attended one of the 3 day-long courses and the feedback from both participants and trainers has been extremely positive. As conservation professionals are made more aware of farmers' business preoccupations and concerns, they are more able to identify aspects of payment schemes which will be most attractive to farmers, and to put together incentive packages which can attract a good level of uptake and continued commitment from farm families. Such innovative approaches to knowledge exchange and dialogue can enable policy makers to broaden the range of incentives on offer (e.g. including capital grants as well as management payments), and increase farmer knowledge of issues around sustainability. There is potential for such an initiative, based around improved dialogue, in Wales and this has been discussed with farmers and officers working on the Forgotten Landscape project in Torfaen.

12. The CCRI research undertaken for CCW and WG on farmer co-operative groups identified likely factors of success for organising and delivering collective agri-environment schemes in Wales. It identified the importance of locally-adaptable engagement strategies, recognizing that motivations for group working will vary according to farm types, sizes, farmers' ages, family situations and so on. Whilst economic motives for collaboration are clearly important, the study found that there were also positive social, cultural and psychological factors that motivated farmers to join such groups. The research also revealed the importance of institutional arrangements that allow groups to develop their own solutions and implementation rules (rather than having these already pre-defined by the scheme); as well as a need for external support, offering the services of a local facilitator and funding for both planning and management stages, for any group farm scheme. The research was able to identify the extent to which both business and social confidence can grow within such groups, thus opening up further development opportunities into the future. In this way, funding for group agri-environment schemes in Wales has the potential to act

as a catalyst for further development opportunities, including farm diversification activity, collective input purchasing and novel product marketing strategies.

13. Approaches in which farmers and advisers work closely together to review and modify farm management in novel ways are regularly referred to as examples of the ‘co-production of knowledge’. A potentially successful approach was developed in Exmoor (Short and Dwyer 2012). Here the farmers and land managers were not incentivised to work together by management payments, but by being invited to be part of the solution to a challenging water catchment issue. This response is consistent with the findings of earlier farmer behaviour work by the CCRI (Dwyer et al 2007) that outlined the importance of trust between various interest groups as a motivator for positive behavioural change, something that develops with increased communication, over time. Another interesting prospect within the Exmoor study was the capacity to attract funding from South-West water to assist in achieving certain agricultural management changes, on the basis that this should lead to water quality improvements in their supply to Taunton. Whilst CCRI’s work on the model ceased following production of a scoping and feasibility study, we understand that the National Park has been working with farmers and stakeholders in the same area, brokering ideas about some kind of agreement with the water company, among the farming community. We suggest that WG should recognise and explore the potential for similar private-sector (utility)-funded initiatives in those situations where the links between land management and specific, vital ES are particularly clear (water, energy, carbon storage).

14. Finally, WG should not ignore the potential for incentives for changed behaviour to come from private food-sector drivers and initiatives. Work by CCRI for LEAF (Linking Environment and Farming – the main promoter of integrated farming methods in the UK) highlighted the significant cost-savings made by several businesses as a result of changing management in ways which should promote ES; as well as the strong perception among farmers that membership of LEAF gave them renewed social standing among the wider community. Food retailer and industry-led producer protocols also include a range of requirements that act as incentives for more sustainable land management practices, as do similar initiatives in the forestry sector (e.g. the FSC certification scheme, now quite widely recognised by major retailers and

some consumers). To date, most of these initiatives have developed independently of policy and public funding. However, there could be scope for increased cost-effectiveness in policy arising from new public-private partnerships associated with the development or promotion of protocols, brands and labels designed (at least in part) to help farmers to improve the sustainability of their land management. Partnership has already been demonstrated to some extent in respect of organic farming, with government incentives supporting action plans in which a variety of private bodies fulfil different roles. CCRI's early work with ADAS on supermarket protocols for fresh produce (funded by the Environment Agency but never fully published due to commercial confidentiality issues) in 2004 indicated that this area of action is likely to remain a key influence upon farmers' management decisions and practices, into the future, and similar points apply to the forestry sector, also, in respect of timber and woodfuel markets.

Q.3 The most appropriate geographical scale(s) at which we should be delivering sustainable land management policies and practices in Wales?

15. The CCRI has been involved in a range of action based research that covers both sustainable land management and improved quality water catchments, working in the upper Thames catchment and elsewhere in south-west England. From this experience, we believe that the most promising approach is to integrate both land and water goals and to let those working at the local level determine the precise mechanisms for achieving these suggested outcomes. This bottom-up approach can be a powerful tool for innovation: within the Upper Thames Pilot Catchment the wide range of stakeholders involved has led to the development of a PES (payment for ES) pilot and another integrated engagement project that is seeking to bring farmer/land owners and communities together, to resolve issues around Water Framework Directive delivery and water flow, biodiversity and flooding.

16. CCRI's report into collective environmental approaches, for CCW, suggested different landscape-scale target areas in Wales for delivering sustainable land management policies, including common land, water catchments, targeting for species and habitat recovery. It was suggested that the geographical scale at which sustainable land management policies are delivered should be dependent on the environmental issues that are being addressed; the desirable spatial configuration of

uptake; and the thresholds of management required to achieve specific objectives. Good scientific evidence and knowledge need to underpin the selection of target areas and the desirable spatial configuration of threshold levels. Local community input can also be important in helping to identify local priorities and ensure that schemes reflect local conditions. In fact, there is evidence that some spatial targeting of payments for agri-environment activities, allowing for local tailoring of management prescriptions, could enhance the economic efficiency of such payment schemes.

17. A key consideration for policy-makers when trying to achieve a particular threshold of change within a target area is to be clear about the priorities and the scale of intervention, and ensure that sufficient funds are available to meet these aims. If resources are limited, it may be best to focus these on a limited number of target areas to successfully achieve threshold levels in these areas, rather than spread resources thinly across several areas and achieve little. However, governance is also a key area and this was explored in the CCRI evaluation of the Integrated Biodiversity Delivery Areas (Short et al 2012). This area focuses on studying the interactions, patterns and trends associated with environmental changes and the ways in which we can moderate or ameliorate the problems that such changes may cause. Our research suggests that a 'one size fits all' approach to delivery should be avoided. Whilst targeted landscape-scale of delivery is preferred to fragmented small-scale delivery, there should be flexibility in the delivery approach so that this can reflect specific conditions. A model of landscape-scale delivery that might work for a lowland arable area, where buffering or connectivity for resource protection is the main priority, would require a different approach to an area such as upland commons, with strong multi-objective priorities including recreation, biodiversity and water protection.

Q.4 How we develop a baseline from which to measure progress? This includes how we collect, coordinate and use data to support sustainable land management in Wales.

18. As social scientists, we recognize that this question will elicit fuller responses from other scientists for whom environmental data management is their main concern. However we would like to make the following comments.

A) In our experience, the involvement of the public in data collection, often referred to as 'citizen science', merits further exploration by the WG. Given the acknowledged

lack of ‘official’ resources available to collect baseline data for Wales, serious consideration needs to be given to exploring opportunities for gathering ‘crowd-sourced’ data from land managers themselves as well as members of the public. These data could be valuable in validating and ground-truthing official data (particularly from remotely-sensed sources), as well as filling gaps in data coverage, of which there will be many. Relatively simple mobile technology solutions could be particularly useful in this regard. Mobile ‘apps’ such as Plant Tracker (EA/CEH/Bristol Uni) and Leaf Watch are showing that high quality spatial datasets can be produced by the public for use in environmental/land management. The FP7 funded project COBWEB, in which the Welsh Government is a key partner, seeks to empower citizens to collect and contribute data for use in policy formation and governance. The project aims to increase the value and interoperability of crowdsourcing technology to policy makers by enabling the fusion of citizen-sourced data with reference data from a range of sources including data published by public authorities.

B) Dissemination of data. Despite a lot of talk about establishing a spatial data infrastructure for Wales, there is little reported progress. In our view, it is vital that the various agencies that collect and manage the bulk of environmental spatial data in Wales (largely NRW and Welsh Water) should coordinate their spatial data collection, management and dissemination within a common framework. A single, public-facing online geoportal could act as a central repository for environmental spatial data for Wales, and as a platform for viewing and downloading all available data. The CCRI would be interested to know how far advanced the WG and NRW are with their thinking on this, to consider the potential role of organisations such as ourselves, in helping to develop and test such a framework.

C) With increasing development of earth observation (EO) techniques, the creation of an absolute baseline date for monitoring becomes less relevant, as a baseline can be set at any time for which satellite imagery or other suitable data is available, and can be done retrospectively, as techniques develop to bring more understanding from EO data that has been collected over many years. This is especially important for those ecosystems where timeliness of assessment is key (such as intertidal areas, or when mapping the maximum extent of flooding). The use of state-of-the-art unmanned aerial systems (UAS) can provide a rapid response to the requirement for timely data

collection, alongside crowd-sourcing and other citizen-science models. Farmer and forester involvement in data collection should also not be overlooked: where it is feasible, such an approach can help to embed a positive engagement with the environmental goals among the beneficiary community; notwithstanding the need to ensure that reporting is reliable and can be triangulated with other more coarse-grained or arm's length sources of information.

Concluding remarks

19. We thank the Committee for the opportunity to compile and submit this evidence and we hope that it will be useful to the inquiry.

*Janet Dwyer, Chris Short, Jane Mills, Matt Reed and Rob Berry,
Countryside and Community Research Institute
University of Gloucestershire, Oxstalls Lane
Longlevens, GLOUCESTER
GL2 9HW
Tel: +44 (0)1242 714122*

References

Brackenbury S and Short C (2013) *Doing Things Differently: Glastir Common Land Element and the Local Action Groups. An evaluation of the Commons Development Offer role using the LEADER methodology.* Report to the LAG groups. Commons Vision: Swansea.

Dwyer, J. (2010). UK Land use futures: policy influence and challenges up to 2060. Land Use Policy. <http://dx.doi.org/10.1016/j.landusepol.2010.12.002>

Dwyer, J. and Short, C. (2011) An ecosystem services pilot in the South West; building a framework for delivery, Report to Exmoor National Park Authority and Natural England. CCRI: Cheltenham.

Dwyer, J. (2013) Policy integration for sustainable agricultural landscapes: taking stock of UK policy and practice. *Landscape Research*. DOI:10.1080/01426397.2013.784245

Fera, CCRI, ADAS (2013) Evidence requirements to support the design of new agri-environment schemes BD5011, Report to Defra Fera: York.

Julie Ingram, Jane Mills, Ana Frelih-Larsen, McKenna Davis, Paolo Merante, Sian Ringrose, Andras Molnar, Berta Sánchez, Bhim Bahadur Ghaley, Zbigniew Karaczun (2014 Forthcoming) Managing Soil Organic Carbon: a Farm Perspective. Article in *EuroChoices*.

Ingram, J., Gaskell, P., Mills, J. and Short, C. (2013) Incorporating agri-environment schemes into farm development pathways: a temporal analysis of farmer motivations. *Land use Policy*. 31, 267– 279

Jones L *et al* (2012) Scale dependence of stocks and flows in the valuation of ecosystem services, Report to the Valuing Nature Network, NERC.

Mills, J., Gaskell, P., Reed, M., Short, C., Ingram, J., Boatman, N., Jones, N., Conyers, S., Carey, P., Winter, M., and Lobley, M (2013) *Farmer attitudes and evaluation of outcomes to on-farm environmental management*. Report to Department for Environment, Food and Rural Affairs (Defra). CCRI: Gloucester

Mills J, Gibbon D, Ingram J, Reed M, Short C and Dwyer J (2011) Organising Collective Action for Effective Environmental Management and Social Learning in Wales, *The Journal of Agricultural Education and Extension*, 17: 1, 69– 83

Short C, Fisher R, Mills J, Jones O, Kambites C, Manley W, Cairns, A and Gaskell P (2012) *Integrated Biodiversity Delivery Area Programme: Selection and Development Phase* Evaluation Report to Natural England. CCRI: Gloucester.

Short, C. and Dwyer, J. (2012) Reconciling pastoral agriculture and nature conservation: developing a co-management approach in the English uplands. *Pastoralism: Research, Policy and Practice*, 2:13. Available at:

<http://www.pastoralismjournal.com/content/2/1/13/abstract>

Short, C., Griffiths, R. and Phelps, J. (2010) *Inspiring and Enabling Local Communities: an integrated delivery model for Localism and the Environment*. Report to Farming and Wildlife Advisory Group and Natural England. CCRI: Cheltenham.

Sutherland, L., Mills, J., Ingram, J., Burton, R.J.F., Dwyer, J. and Blackstock, K. (2013) Considering the source: Commercialisation and trust in agri-environmental information and advisory services in England. *Journal of Environmental Management* 118 (2013) 96–105.