

## Scottish Government Consultation on a 'Future of Scottish Agriculture': A response from the James Hutton Institute

The [James Hutton Institute](#) welcomes the Scottish Government setting out a vision for the future of agriculture in Scotland. We are very supportive of the recognition of the potential for Scotland's agricultural land use, businesses and practices to contribute to addressing global challenges of food and environmental security and rural development, accruing benefits nationally and locally and contributing to what has to be a global effort.

The overall vision could take the opportunity to promote agriculture as a key aspect of integrated solutions to societal challenges. Agricultural issues are common to much of the United Nations 2030 Agenda for Sustainable Development which applies to all countries at all stages of development (See Outcome 9), but which were only adopted after publication of the Scottish Government consultation document.

Therefore, the vision could position Scottish agriculture more explicitly at the forefront of delivering to that global agenda, and to highlight in Outcome 9, which would also link our world-leading positions on climate change, land use, soils and food and drink.

Comments on individual Outcomes follow.

### **Outcome 1: Strong sustainable growth in profits from agriculture, driven by increased market-orientation, competitiveness and resource-efficiency**

- (i) We support recognition of the importance of the social and environmental benefits delivered by farmers in remote and fragile areas. However, environmental benefits of farming may be as, or more, important in areas not categorised as remote, such as on the borders of urban areas and along major routes where benefits may be enjoyed by the greatest number of people. In addition, components of farming areas that are not considered as remote may also deliver critical environmental benefits, for example woodland, field boundaries, farmland birds, reduced Greenhouse Gas emissions, etc. The environmental benefits delivered by farming on these other locations should also be represented.
- (ii) **Next steps:** We suggest adding to Next Step 4 with, "... and translation of science".
- (iii) As Outcome 1 emphasises resource efficiency, reference should be made to the circular economy and the leading role that Scotland can play in its development and adoption, thus also positioning Scotland as contributing to the EU Strategy of a Resource Efficient Europe. For example, objectives of the circular economy will be delivered on farms via nutrient recycling and through the supply chain as added value to new co-products. However, it would also be appropriate to adopt risk-based approaches to inform the development of circular economy in relation to resource efficiency (see also note under Outcome 3).
- (iv) Reflecting the statements about reducing reliance on the CAP, processes should include improved notice of changes in regulatory and financial infrastructure (e.g. changes in payments, eligibility (e.g. LFASS to ANC).

### **Outcome 2. Our agriculture industry works as part of our food and drink sector to increase profitability and strengthen Scotland's reputation as a Land of Food & Drink**

- (i) **Vision:** This should include reference to the development of new products of global significance.

- (ii) **Next Steps** should include reference to steps which strengthen the role of the agriculture industry, and the research base which links agriculture and nutrition, in improving the Scottish diet. For example, partnership working could include the identification and support for 'hubs' (e.g. for barley) which are a focus for research and industry to work together to translate research into economic, social, environmental and commercial benefits.
- (iii) There is a need for the prices paid by the food and drink industries (i.e. the buyers and processors) to be commensurate to enable the growth of local agricultural produce to high environmental standards.
- (iv) The strength of the message of support the agriculture sector provides the food and drink industry would be enhanced by reference to high impact, high value examples, such as the well-connected supply chain linking research into resilient barley varieties through to the production and marketing of Scotch whisky, the latter nearly £5bn to the UK economy annually and almost £4bn in exports.

**Outcome 3. Agriculture, and the wider agri-food supply chain, is resilient to shocks and to future challenges**

- (i) **Vision:** We suggest adding to the vision that, “and is recognising and embracing the need for a circular economy approach”.  
  
The sustainable supply of nutritious food (and drink) are a central tenet of the Scottish Food and Drink policy and form the basis of analogous efforts at national, EU and global levels. Over the last 10 to 15 years, there has been a significant increase in the use of crops as sources of sustainable raw materials, either grown primarily for this use or the development of co-products from what was previously considered as waste streams. This approach, along with general resource reuse, is recognised through the concept of the circular economy. The concept is advocated by the Scottish Government (see consultation in 2015) and the [European Union Action Plan for the Circular Economy](#), and should be recognised in Outcome 3 (see also note under Outcome 1).
- (ii) **Vision:** We also suggest adding to the vision that, “Scottish agriculture continues to evolve and adapt to the changing climate and consumer demands”.
- (iii) Concern that Scottish agriculture should be able to adapt to external factors, such as climate change, is supported by findings in the Scottish Government Strategic Research Programme. For example, findings indicate that previous and current agricultural practices may not be suitable in the future, with a need to plan for new technologies, soil management under waterlogged conditions, potential needs for irrigation, crop varieties producing a stable output under adverse conditions, etc. to ensure sustainability (e.g. *Brown and Castellazzi, 2014, Regional Environmental Change 14: 1357-1371*). We also note that farming in Scotland has to contend with highly variable weather conditions within an often volatile maritime climate. Climate is a key factor in the James Hutton Institute’s classification of the [Land Capability for Agriculture \(LCA\)](#) for Scotland. Research in the Scottish Government Strategic Research Programme illustrates the potential impacts (both positive and negative) of such variability. We are willing to engage with the relevant teams in Scottish Government to share understanding of the potential implications for long term planning and awareness of risks to agriculture and its associated supply chains.
- (iv) A key component of successful adaptation is being able to take advantage of new opportunities to improve productivity and resource efficiency, in addition to resilience to

shocks. A good example is the prospective opportunities provided by a warming climate and longer growing season, but which are accompanied by an ongoing requirement for continued investment in adaptive crop varieties as well as good practice for crop/livestock management, particularly to protect soil and water quality.

- (v) We note reference to the recent volatility on prices. However the Vision should also be informed by forecasts of future trading prices being more stable than recently, and higher than the low levels of the 2000s (e.g. OECD, [www.agri-outlook.org/executivesummary/#d.en.348605](http://www.agri-outlook.org/executivesummary/#d.en.348605); [http://aes.ac.uk/upload\\_area/pdf//001\\_Jonathan\\_Brooks.pdf](http://aes.ac.uk/upload_area/pdf//001_Jonathan_Brooks.pdf)) (depending upon the Sterling exchange rate).
- (vi) **Next Steps:** To demonstrate the benefits of cooperation between farmers and processors or retailers, better use could be made of case studies of how Scottish agriculture and business are identifying new opportunities (e.g. the increasing role of agricultural wastes, or co-products, as a cornerstone of new companies).

#### **Outcome 4. High levels of training, education and skills enable farmers to improve their profitability and become greener**

- (i) To achieve the vision, there is a key role for contemporary knowledge and innovation systems, such as reliable outlook projections, and access to technical know-how. The [European Commission Standing Committee on Agricultural Research \(SCAR\)](#) identifies the importance of innovation in tackling the challenges faced in the development of a European bio-economy, expanding on the topic in its foresight paper '[Agricultural Knowledge And Innovation Systems Towards The Future](#)'. This draws on findings from an EU project involving James Hutton Institute (ProAKIS) on the roles and functions of advisory services in Europe as part of the process of innovation generation and problem solving, about which we would be happy to confer with Scottish Government (see also Outcome 9).
- (ii) Research at James Hutton Institute shows the importance of access to knowledge and advice in support of innovation and the uptake of new opportunities (e.g. agri-renewables, see Sutherland et al. (2015, [Research Policy](#), 44, 1543-1544), and EU project FarmPath, [www.FarmPath.eu](http://www.FarmPath.eu)). On specific actions, we suggest:
  - a. the provision of advice should take a systems-level perspective, ensuring all parts of the system are considered, consistent with understanding entire supply chains;
  - b. all types of providers of advice should have access to contemporary information;
  - c. encouragement of Continuing Professional Development and lifelong learning of such providers (e.g. through the Scottish Enterprise Rural Leadership Programme), ensuring learning opportunities have flexible arrangements to enable uptake by different types of farmers;
  - d. an explicit focus on how to combine profitable and green farming at the level tailored to individual farms;
  - e. monitoring and evaluating the effectiveness of different programmes of relevance;
  - f. reviewing the Monitor Farm Programme (e.g. considering experiences with Teagasc Discussion Groups in Ireland and the Soil Association's Innovative Farmers model), and informing new initiatives (e.g. AHDB Strategic Potato farms);
  - g. a focus on developing those skills that help farmers in their decision making, including financial performance and productivity, and production assets (e.g.

recording inputs, costs, benchmarking against similar farms, soil testing, and deriving appropriate measures from the information generated).

- (iii) **Next Steps:** In promoting training and education as an investment, distinctions should be made between skillsets required for: a) farmers managing their own farm, b) contractors undertaking work on different farms, c) farm employees, and d) managers of companies renting farmland for short term cropping. The Scottish Government's SRDP 2014-2020 supports a number of advisory services and these should be exploited.
- (iv) Associated with training, evolutions in information technology (e.g. Unmanned Aerial Vehicles) raises new possibilities of access to systems which can provide farmers with real time information to aid land and crop management. For example, recent work by the Scottish Soils Website and Scottish Soil Monitoring Action Plan teams has identified that information needs to be packaged in a more useful manner.
- (v) The opportunity could be taken to encourage further progress towards gender balance in farming and advisory businesses.

#### **Outcome 5. Farmers boost their performance by embracing innovative techniques and best practice, underpinned by Scotland's world-leading research institutes**

- (i) To achieve an overall aim of the Vision of contributing to global food security, Outcome 5 could advocate a vision of 'Scottish led research which guides farming practices that tackle climate change and increase the resilience of rural communities globally'. The associated Next Steps would be to 'build on the global network of relationships in research and practice of the world leading science undertaken in Scotland'.
- (ii) The James Hutton Institute, in common with other Scottish research organisations, has a global network of collaborators working on agriculture related topics. Networks such as the EU Joint Programming Initiative Modelling European Agriculture with Climate Change for Food Security ([www.facejpi.com](http://www.facejpi.com)), and the Global Research Alliance on agricultural greenhouse gasses (<http://globalresearchalliance.org/>) provide avenues for the exploitation of expertise and findings from Scottish researchers amongst global beneficiaries.
- (iii) The James Hutton Institute receives support through the Scottish Government Rural and Environment Science and Analytical Services division (RESAS) in its [Strategic Research Programme](#) (2016-21). This support contributes to the development and maintenance of world class facilities and resources for supporting the research and its translation to our stakeholders and audiences. We continue to seek innovative ways of exploiting the full potential of unique collections (e.g. [Commonwealth Potato Collection](#)) and archives (e.g. [National Soil Archive](#)), and developing new approaches to enabling access to data about Scotland's soils and wider environmental characteristics. Examples include the provision of mobile Apps for accessing information on characteristics of soils, or the potato collection.
- (iv) We strongly support the creation of impact from research supported from all sources (public, private, voluntary and philanthropic), translated into forms that are accessible to the farming community, their advisors and the agricultural research community, for example through the developing Farm Biodiversity Initiative of the James Hutton Institute and SRUC. We are committed to working collaboratively with end users from the outset to ensure a multi-way flow of information. The research platforms of the James Hutton Institute (e.g. [Centre for Sustainable Cropping](#), at Balruddery, [Glensaugh](#) and [Hartwood](#) farms), and those of partner organisations (e.g. SRUC and Moredun)

support engagement with industry in particular, as well as communities and government. As working farms they enable demonstrations on farms, by farmers, which also underpins the Farm Biodiversity Initiative of James Hutton Institute and SRUC.

- (v) We will continue to work with partners to build on the success of industry oriented events (e.g. [Potatoes in Practice](#), [Fruit for the Future](#), [Cereals in Practice](#), the [LEAF Technical Days](#) and Open Farm Sunday to showcase innovative research and best practice. We welcome opportunities for expanding on such activities to the benefit of other partners.

## **Outcome 6. Scotland is a world leader in green farming**

- (i) **Vision:** We welcome reference to Ecosystem Services (ES) when envisioning farmers as custodians of the natural environment. ES provide a valuable model for consideration of the interactions and co-dependencies of natural resource use, taking a ‘whole system’ perspective, and thus to deliver on the Sustainable Development Goal and EU policy of halting land degradation.
- (ii) We welcome the recognition that multiple benefits can be realised through the best use of land (e.g. ensuring water quality, minimising Greenhouse Gas Emissions through adopting appropriate agricultural practices, enhance landscapes). However, the message would be stronger if the wording regarding the combination of food production with other land uses stated that the best use of land is by creating multiple benefits, rather than and creating such benefits.
- (iii) **Next Steps** Attention should be given to understanding those practices at farm and landscape levels that are primarily responsible for negative aspects of farming including erosion, soil degradation, limits to yield and losses of biodiversity. Given such knowledge, research and practice should combine to devise new methodologies to reverse declines in ecological function, particularly under high intensity farming, while maintaining profitable outputs.
- (iv) We recognise that Ecosystem Services (ES) concepts may not be immediately accessible to farmers but the expertise of the Scottish research institutes can provide both the training and underlying science base to help to integrate consideration of ES into farming practices.
- (v) We welcome the ambition for a step change in aligning environmental and commercial success in farming. Our research is showing that ‘green farming’ creates business benefits due to enhancing the resilience of landscapes to environmental change. In the near future, new ‘green’ technologies and resource management approaches will become available be made available to build in this landscape resilience with respect to functions such as river corridor ecological condition, water holding capacities to tackle floods and droughts, and reducing soil loss. Such a step change recognises that farming can be part of the solution to environmental issues, not part of the problem.
- (vi) Research findings and outreach by the James Hutton Institute suggests that there is a need for clarity of local and national objectives across the range of environmental policies for there to be effective environmental management alongside farm business activities.

## **Outcome 7. Agriculture is recognised as an exciting and rewarding career and there are a range of routes into the industry for new entrants**

- (i) **Vision:** We are very supportive of the vision of encouraging careers in agriculture. As part of the EU2020 Strategy and Innovation Union, the European Commission set up the [European Innovation Partnership on Agricultural Productivity and Sustainability](#), which included a focus group on “[New Entrants to Farming: Lessons to foster innovation and entrepreneurship](#)”, chaired by a member of staff at James Hutton Institute. This is reporting on the benefits of new entrants to the agricultural sector and rural economies through, for example: their introduction to new knowledge and techniques, development of new business models based on end-users and of new organisational models (e.g. share farming, prefinancing, crowd sourcing), increasing connections between farming and the local community, and using traditional knowledge to develop business innovations (e.g. artisanal food production).
- (ii) **Next Steps** could consider some of the approaches adopted in other EU and EEA countries such as Ireland, France, Denmark and Norway. These programmes enable the establishment of new farm businesses through ‘share farming’ and ‘joint ventures’, and agreements between existing farmers and new entrants to share or gradually transfer farming resources (such as labour, livestock, land). We would be happy to share the information reviewed with the relevant stakeholder communities.

## **Outcome 8. Agriculture is valued for its contribution to Scottish society**

- (i) **Vision:** The James Hutton Institute supports recognition of the important role that farming plays in relation to Scotland’s national identity and its population.
- (ii) Farming practices have made a significant contribution to the formation and character of Scotland’s landscapes, and can be expected to continue to do so while adapting to new technologies (e.g. increased use of polytunnels) and changing conditions (e.g. climate). This implies a need for updating relevant data which inform our understanding of the significance of changes in agriculture, such as the [Landscape Character Assessment of Scotland](#). It is also an opportunity to use new information technologies to inform the public of connections between agriculture and our national identity expressed through the evolution of our soils, land uses and landscapes (e.g. extending [Scotland’s Environment Web](#)).
- (iii) **Next Steps:** Our research findings show that through SRDP funding, farmers are increasing their role in safeguarding habitat and supporting Scotland’s unique native flora and fauna, and are advocates about the positive part they play in maintaining the diverse landscape of our countryside while continuing to provide good quality food. However, to be effective in integrating conservation with farming, farmers require access to appropriate funding mechanisms which could result from reform of CAP measures. The Institute’s programme of research could help in determining the nature of such measures.
- (iv) Examples of mechanisms for an active programme of knowledge exchange could be explicitly identified, and how those would link to the promotion of the societal benefits of agriculture within Scotland. This should include the international promotion of Scotland and its produce (e.g. whisky, beef, soft fruits) and their association with our national identity.
- (v) In collaboration with partners in industry, public agencies, and NGOs, the James Hutton Institute will be a willing contributor to raising public understanding of the origin of the

food they eat, and the links between food, farming and wider societal benefits (linked to Outcome 2).

**Outcome 9. Scotland takes a leading role on key issues affecting agriculture on the UK, EU and world stages**

- (i) **Next Steps:** As noted in the introduction to this response, it would be appropriate to refer to the United Nations 2030 Agenda for Sustainable Development, and how the role of agriculture in Scotland will contribute to them being achieved, linking to other policies of relevance such as the Scottish Land Use Strategy and the Scottish Soils Framework.
- (vi) In delivering stronger partnerships, the Next Steps could build on the significant contributions which Scottish research organisations make on advising policy related institutions in the European Union. For example, Scottish researcher are on 5 of the 20 Focus Groups of the European Innovation Partnership on Agricultural Productivity and Sustainability (EIP-AGRI), more than any other European region; and the European Food Safety Authority which provides scientific advice in response to requests from the European Commission, the European Parliament and EU Member States.