Department
for Environment
Food & Rural Affairs

# Sustainable Land and Soils and Sustainable and Competitive Farming Strategy: Joint Evidence Plan

## Policy portfolio: Sustainable Land and Soils and Sustainable and Competitive Farming Strategy

## Policy area within portfolio: Sustainable Land Management and Livestock Farming (SLMLF)

**Timeframe covered by Evidence Plan: 2013/14-2017/18**

**Date of Evidence Plan: March 2013**

This evidence plan was correct at the time of publication (March 2013). However, Defra is currently undertaking a review of its policy priorities and in some areas the policy, and therefore evidence needs, will continue to develop and may change quite rapidly. If you have any queries about the evidence priorities covered in this plan, please contact StrategicEvidence@defra.gsi.gov.uk.

# Contents

# 1. Policy context

**What are the key policy outcomes for the policy programme/area?**

In the UK, agriculture accounts for around 70% of the land area and therefore plays an essential role in achieving environmental outcomes for rural landscapes, water quality and biodiversity.  At present, agriculture contributes around 0.6% of GDP but the wider food manufacturing sector is a significant part of the UK economy (6.5% of GDP). There is potential to increase the contribution of domestic agriculture to this. In order to support growth in the sector, it is necessary to reduce inefficiencies that both reduce competitiveness and give rise to negative environmental outcomes. Furthermore, the UK has a role as a global leader in agricultural science and technological innovation (with BIS funding of research councils), an area that could deliver economic growth with appropriate support for technology transfer (i.e. from fundamental science to the applied domain).

The intensification of agriculture over the past 60 years has greatly improved agricultural yields through increased specialisation, improved crop and livestock varieties and access to inputs such as concentrated livestock feeds and synthetic fertilisers. This, however, has come at a cost to biodiversity, water quality, soil and a range of other environmental goods and services. Achieving environmental gains from agricultural land management is essential to meet the wide range of government ambitions and legislative commitments on biodiversity, water quality, air quality, greenhouse gas emissions and flooding[1]. Agricultural land management also plays an important role in conserving traditional landscapes and historical features which underpin the rural economy through tourism. The conservation, restoration and enhancement of traditional landscapes is a key aim of agri-environment schemes such as Environmental Stewardship which provides financial incentives for farmers to provide environmental public goods which often require the continuance of low input (extensive) farming practices.

The Common Agricultural Policy (CAP) has a significant impact on the farming sector.  In October 2011, the European Commission published proposals for reform of the CAP for the period up to 2020.  Of particular relevance to agri-environment policy are the proposals to 'green' Pillar 1 and the rural development policy priorities for restoring, preserving and enhancing ecosystems, resource efficiency and tackling climate change[1].

The potential for conflicts between agricultural production and environmental protection is likely to increase in the future.  The Foresight report on the Future of Food and Farming[2]

---

[1] E.g. set out in Biodiversity 2020, Natural Environment White Paper, Water White Paper, Water Framework Directive, Climate Change Act, National Emissions Ceilings Directive, Habitats Directive etc.

[2] Foresight Report on the Future of Food and Farming, Government Office for Science 2011 (http://www.bis.gov.uk/assets/foresight/docs/food-and-farming/11-546-future-of-food-and-farming-report.pdf )

has predicted that global food demand may increase by 70% by 2050. Resulting increases in food production need to take place in the context of dwindling resources in volatile commodity markets and a changing climate. These factors are likely to influence food security, the frequency of extreme weather events, infectious disease epidemiology and growing conditions for crops. One of the key findings of the report was the need to produce more food from fewer inputs whilst improving environmental performance through *sustainable intensification*:

> *"It follows that if (i) there is relatively little new land for agriculture. (ii) more food needs to be produced and (iii) achieving sustainability is critical,* **then sustainable intensification is a priority.**
>
> *Sustainable intensification means <u>simultaneously raising yields, increasing the efficiency with which inputs are used and reducing the negative environmental effects of food production</u>".*

The UK agricultural sector has an important role in leading the way towards sustainable intensification to meet this challenge.

**Scope and policy outcomes:**

The Defra Sustainable Land and Soils (SLS) and Sustainable and Competitive Farming Strategy (SCFS) teams contribute to the top three coalition priorities for Defra:

- o Support and develop British farming and encourage sustainable food production

- o Enhance the environment and biodiversity to improve quality of life

- o Support a strong and sustainable green economy, including thriving rural communities, resilient to climate change.

These need to be delivered by supporting innovative practices in the sector that improve production efficiency whilst safeguarding environmental outcomes through simplified regulation, improved guidance, advice and incentive schemes.

Improving the management efficiency of soil, nutrients, crops and livestock will generate 'win-wins' that improve both economic and environmental performance, but it will also be necessary to prioritise between production and environmental goals at field, farm and landscape scales, where unavoidable trade-offs exist due to limitations in land capability or specific environmental risks. The Green Food Project (which was set up following publication of the Natural Environment White Paper ) set out a number of recommendations on how to achieve this which can be summarised into three policy objectives:

1. **<u>Bringing more farms up to current best practice to enhance economic competitiveness and environmental performance:</u>** At present there is a wide distribution in performance across farms in both economic and environmental performance. A major priority is to close the gap by improving performance of the worst to improve environmental impact, increase the contribution of the sector to

economic growth and thereby improve the international competitiveness of UK agriculture.

2.  **Advancing the frontier of best agricultural practice (economic and environmental) over time through the application of cutting edge research and new technology:** The evolving BIS/ Defra/ DfID Agri-tech Strategy sets the framework for encouraging the adoption of new technologies in the agricultural sector to improve competitiveness and stimulate rural economic growth. The strategy will address barriers to effective knowledge and technology exchange leading to more farmers adopting innovative practices which support competitiveness whilst also delivering improved environmental performance. Translating science into practice through effective, co-ordinated knowledge exchange mechanisms was also a key recommendation of the Taylor Review.

3.  **Achieving a balance between environmental and production outcomes at farm, landscape and national level:** Whilst many options for improving production and environmental performance present themselves as cost savings to the farmer, it is important to recognise cases where there are inherent trade-offs between agriculture and the environment.  In these cases, options may include reducing the intensity of production, dedicating land for biodiversity or other ecosystem services. Policy mechanisms to deliver such options include agri-environment schemes such as Environmental Stewardship.  The new rural development programme for England (RDPE) from 2014 to 2020 will provide an opportunity to maximise environmental benefits and improve value for money from future agri-environment schemes.  Markets for ecosystem services associated with air and water quality, biodiversity and other environmental outputs are emerging but need further development. Methods for assessing trade-offs between different ecosystem services as well as meeting biodiversity commitments, for example, in the Natural Environment White Paper (NEWP) and the England Biodiversity Strategy, need to become more sophisticated at farm, landscape, and food chain levels to support the delivery of agri-environment and other payments for ecosystem service provision.

    One of the main themes to emerge from the NEWP itself is the ambition to halt and reverse the decline in biodiversity (described in more detail in the England Biodiversity Strategy).  This called for a more integrated large-scale approach to conservation, and set out a series of high level targets aimed at achieving this goal (establish more coherent and resilient ecological networks, targeted action for the recovery of priority species, and  ensuring that 'agricultural' genetic diversity is conserved and enhanced wherever appropriate).

This evidence plan supports the development and delivery of the above over-arching objectives via the following specific policy objectives and mechanisms:

*Stakeholder Engagement*

- Achieving stakeholder consensus on the strategic response to challenges of land management and food consumption.

*Streamlining and Improving Advisory Services*

- Improving partnership working between the Agriculture and Horticulture Development Board (AHDB) and Government allowing a more responsive approach to updating and improving advice and guidance.

- Integrating advice and incentives so that they cost less and deliver more.

- Increased use of online services producing savings and helping to develop British farming.

- Improving the effectiveness of voluntary and partnership approaches to improve agricultural competitiveness and environmental outcomes.

*CAP Reform (including agri-environment schemes)*

- Influencing CAP reform and EU market support measures to improve competitiveness, innovation and environmental performance by reducing reliance on pillar 1, with a view to its eventual phase out.

- Ensure that the 2014-2020 Rural Development Programme continues to improve the environmental performance of farming, particularly through the development of improved agri-environment schemes and the incorporation of landscape scale options.

- Ensure the CAP recognises the challenges facing areas with natural constraints such as upland communities.

*Providing Support for Specialist Sectors*

- Provide an effective Competent Authority to ensure compliance with EU and domestic Organic Regulations, and ensure appropriate support for organic farming under the Rural Development Programme.

- Developing strong and effective engagement with livestock and poultry sectors to provide strategic support in the face of economic and market pressures.

*Greenhouse gas (GHG) mitigation and adaptation*

- Increasing the uptake of effective on-farm mitigation measures which reduce GHG and other emissions through the voluntary industry GHG Action Plan and encouraging farmers to adapt to climate change through measures advocated by the National Adaptation Programme.

- Increasing take-up of effective and efficient on-farm measures which target reductions in GHG emissions and help to tackle other environmental impacts associated with agriculture in England.

- Identifying and promoting best options for sustainable implementation of bioenergy generation.

*Soil Protection*

- Ensuring that all soils are managed sustainably by 2030.

- Protecting peat by reducing peat extraction and reducing peat use in horticulture.

- Simplifying the contaminated land regime and developing tools to make the new regime work in practice.

- Supporting the continuing provision of ecosystem services, including the role of soils in mitigating greenhouse emissions and adapting to climate change.

*Genetic resources*

- Key genetic resources are conserved and used in accordance with legal obligations and international commitments.

# 2. Current and near-term evidence objectives

**What are the current and near-term objectives for evidence and how do they align to policy outcomes?**

The joint SCFS and SLS evidence programme supports (1) design, (2) implementation and (3) evaluation of policy to achieve the above outcomes.  Specific short-term (<3 year) evidence needs are set out in the tables below.  From within this the top priorities are as follows:

- Identify technologies with potential to improve the economic and environmental performance of the agricultural sector through translational applied research.

- Review of evidence on barriers to bringing more farms up to current best practice.

- Evaluation of agri-environment options and synthesis of evidence to inform the development of the next set of RDPE agri-environment schemes.

- Evidence to balance the competing demands of food production, biodiversity aims and other ecosystem services at local and regional scales (which links through to the top priority in section 3 and the proposed Sustainable Intensification Research Platform set out in section 4).

### SCFS: Improving the competitiveness and environmental performance of UK agriculture

| Policy area | Design | Implementation | Evaluation |
|---|---|---|---|
| **1. Increasing production by bringing more farms up to current best practice** | Carry out a structured programme review of SCFS and SLS evidence. | Assess evidence priorities identified in the industry *Feeding the Future* strategy (http://feedingthefuture.info/). | Identify key areas to strengthen the evidence base. |
| | Improve existing surveys to assess industry progress in adoption of best business practice, including measures to reduce GHG emissions. | Assess the provision of advice to encourage uptake of measures to improve competitiveness and reduce environmental burden of farming. | Evaluate impact of integrated advice on farm efficiency. Identify barriers to uptake of efficiency measures and work with industry to resolve these. |
| | Identify innovative solutions for improving production efficiency. | Improve knowledge exchange to encourage technology transfer. Monitor physical and economic performance by sector. | Independently review factors causing a decline in UK farm competitiveness, including impacts of CAP. |
| | Agree methodology and data gathering requirements to assess the impacts of the Voluntary Code for Dairy farming. | Survey farmers'/ land managers' views on producer organisations/co-operative networks to inform engagement. | Evaluate impacts of the voluntary code on farm incomes. Undertake forward projections of impacts of price volatility on the sector. |
| | Identify barriers and opportunities for new entrants to the farming industry (facilitating the formation of an industry led group to consider). | Contribute to industry led group discussions and provide evidence support from existing data/ surveys. | Evaluate the findings of the group via Farm Business Survey data analysis. |
| **2. Advancing the frontier of best agricultural practice (economic and environmental)** | Identify existing and future technologies with potential to radically alter the performance of the sector in collaboration with the Devolved Administrations and the Global Research Alliance on Agricultural GHG Emissions (GRA). | Establish research with the Devolved Administrations on technologies such as Earth observation, novel sensors and instrumentation, robotics, precision farming etc. Encourage uptake through knowledge exchange networks and international partnerships such as the GRA. | Evaluate and share international knowledge on food security, GHG emissions and Climate Change adaptation research, notably through the EU Joint Programming Initiative on Food Security, Agriculture and Climate Change (FACCE-JPI). |
| | Identify potential adverse impacts of technologies and public reaction. | Collate evidence to inform a public debate on implementation of new technologies e.g. biotechnologies (including GM and cloning). | Evaluate opportunities for new technologies in the light of food security challenges. |
| **3. Achieving an optimum balance between production, biodiversity aims and the delivery of other ecosystem services delivered by agriculture** | Determine synergies and tradeoffs between genetic resource, production, biodiversity aims and other ecosystem services at farm and landscape level in collaboration with Research Councils, the Agriculture and Horticulture Development Board (AHDB), and the Devolved Administrations. | Develop models and decision support tools through a Sustainable Intensification R&D Platform (see Section 4) to help manage tradeoffs between ecosystem services at the farm and landscape scales. | Evaluate the suite of measures and tools to support provision of ecosystem services. |
| | Design structured programme to establish markets for ecosystem services, including farm business diversification with the Defra Food and Green Economy Directorate and industry. | Provide evidence of benefits to develop food chain and other industry markets for ecosystem services. | Evaluate potential for ecosystem service markets. |

## SLS: Improving the contribution of the agricultural sector to the provision of biodiversity and the range of ecosystem services

| Policy area | Design | Implementation | Evaluation |
|---|---|---|---|
| **1. Engaging with and responding to CAP reform and designing a future Rural Development Programme for England (including agri-environment schemes)** | Short-term synthesis of evidence to inform the development of the next Rural Development Programme for England (RDPE) and CAP regulations. | Ongoing evidence collation to support the role of Natural England in the delivery of RDPE schemes, including understanding environmental issues arising from land management promoted by these schemes (with a specific for habitats and species that are covered under domestic and EU law). | Evaluate evidence on the performance of current RDPE land management schemes in order to inform the design of the next programme. |
| | Develop approaches to spatially target agri-environment schemes based on synergies and trade-offs between multiple environmental and production policy objectives. | Develop measures and delivery options for current and future agri-environment schemes and EU CAP 'Greening' proposals. | Develop a monitoring and evaluation strategy for schemes under the next RDPE. This may include the development of improved result and outcome indicators and new monitoring methodologies. |
| | Synthesise social research on the implementation of localised stakeholder-led approaches to environmental management (e.g. capitalising on Local Nature Partnerships and catchment-based approaches). | Continue to refresh baseline data held on the location, condition and potential of environmental features to allow for more accurate targeting of interventions and greater synergy between objectives. | Continue to track trends in farm practices, economics and their links to agri-environment, including economic and environmental monitoring of CAP impacts. |
| **2. Continuing provision of support for Upland and Organic Farmers.** | Characterise farms and review trends in business incomes in upland and lowland areas facing natural constraints to inform policy options under CAP. | Explore and develop management techniques and regimes to deliver an optimal range of ecosystem services in upland areas. | Evaluate relative importance of CAP payments for farm businesses, factors contributing to stable farm incomes, and barriers to the delivery of environmental and agricultural policy objectives. |
| | Develop agri-environment and greening scenarios for the uplands. | Predicting trends in upland farm income going forward through Food and Agricultural Policy Research Institute (FAPRI) scenario analysis. | Assess the impact of new measures for areas facing natural constraints. |
| | Review Organic Entry Level Stewardship scheme organic conversion rates to inform development of a new organic conversion delivery mechanism. | Compile evidence on the application of EU regulations on organic production and labelling of organic products in the UK and assimilate data on other Member States' practices. | Evaluate participation of organics sector in environmental schemes via Farm Business Survey statistics. Measure environmental and production performance in organic farming systems. |
| **3. Soils** | Compile an evidence-base to inform the UK position on the potential EU Soil Framework Directive. | Develop methods for monitoring peat reduction targets in horticulture. | Evaluate the extent to which current policy and regulatory instruments deliver soil protection outcomes. |
| | Explore options for delivering greater protection for peat soils, for example by using Payments for Ecosystem Services (PES). | Inform the implementation, monitoring and evaluation of the recent changes to the contaminated land regulations and Statutory Guidance. | Defra has committed to reviewing the implementation of the new contaminated land regulatory regime after one year. |
| | Develop evidence to support the development of a revised soil protection review with a view to reducing soil degradation to zero by 2030. | Develop generic contaminated land screening levels and the dissemination of case-studies across the sector. | |
| | Assess barriers to uptake of peat replacement products in the horticultural sector. | | |

# 3. Future evidence needs

**What are the longer-term evidence needs for the policy area/ programme?**

Many of the longer-term (3-5 year) evidence needs for SCFS and SLS cut across policy areas and can be framed according to the overall objective of improving the environmental performance and competitiveness of farming.  A top priority is the integration of information to inform policy and land management decisions that consider the impacts of multiple practices on multiple outputs.  Addressing this need will be a central objective to the proposed Sustainable Intensification Research Platform set out in section 4.

The strategic evidence needs for SCFS and SLS are as follows:

1. Developing new practices and measures to advance the frontier of best practice and improving the environmental performance and competitiveness of farming:
   o Horizon scanning and development of new technologies and farm management practices to deliver step changes in the productivity, competitiveness and environmental performance of agriculture.
   o Evaluating the impact of technologies that have already been introduced and their method of introduction to learn lessons for improving farm performance.
   o Improving evidence on the cost effectiveness of agri-environmental options and ongoing identification and testing of new and refined agri-environment options, particularly in the context of a new Rural Development Programme for England.
   o Providing evidence to inform the integration of farm incentive schemes, e.g. farm woodland and agri-environment schemes.
   o Understanding the perceptual, logistical, technical, regulatory, agronomic and economic barriers to the use of alternative growing media to peat in horticulture and the development of sustainability criteria.
   o Ongoing identification and testing of GHG mitigation options (including ongoing reviews of the GHG Action Plan implementation) beyond best practice.
   o Improving the way in which changes in land management are covered in the Land Use, Land Use Change and Forestry (LULUCF) greenhouse gas inventory.
   o Understanding the role of soils in supporting agricultural production and other ecosystem services.  This will need to develop indicators of soil function and condition.  Work is needed to explore the effect of soil husbandry, degradation and contamination on its function to inform environmental quality standards and the development of practical management advice for farmers.
   o Building on previous research on the application of sewage sludge and other organic materials to land to inform the development of soil limit values, risk assessments, monitoring and evaluation techniques.

2. Integrated Farming Systems: Develop, test and demonstrate systems to achieve multiple environmental and productivity goals at the field and farm-scale. Key focus areas include:
   o Engaging with industry to develop decision support tools and guidance for farmers.
   o Improved monitoring of farm performance against environmental and production objectives. This will inform future approaches for agri-environment monitoring and evaluation.
   o Exploring the capacity for increasing yields in organic farming to assess whether it can deliver required sustainable intensification outcomes.

- o Understanding the costs, benefits and any barriers to implementing measures to farm businesses and to society. This will help to develop effective policies to change behaviours via advice, incentive, and through the existing regulatory framework (e.g. revised Soil Protection Review).

3. <u>Landscape scale targeting:</u> Developing more sophisticated approaches to target policy interventions to balance ecosystem services and environmental/ production goals at the landscape-scale. Key focus areas include
   - o Bringing together available mapping and geographic information to map geographic variation in (1) environmental risk and (2) land capability for food production, other ecosystem services and biodiversity. This will inform the development of spatial targeting mechanisms for future agri-environment schemes and greening of CAP pillar 1 to deliver local priorities.
   - o Developing the next generation of measurement techniques, including earth observation, and modelling approaches to identify environmental hotspots and optimal land uses.
   - o Assessing how combinations of land management interventions interact and affect water quality across whole catchments. Developing decision-support tools that link land management, production and environmental criteria to predict the impacts of land management on water quality at the catchment scale. This will inform the development of policy approaches to deliver Water Framework Directive goals on agricultural diffuse water pollution.
   - o Social research on governance and decision making at landscape scales. This includes opportunities for collaborative approaches action between farmers and other interest groups (assessing the role of grower groups and benchmarking approaches in driving improvements in productivity and environmental performance).
   - o Evidence on the effectiveness of approaches to establish and monitor landscape-scale ecological networks.
   - o Exploring long-term prospects for improving production, profitability and environmental performance in the uplands. This includes the likely impact of land abandonment, changes from traditional practices and non-agricultural uses on the effectiveness of policy levers.

4. <u>Markets and external drivers of land management:</u>
   - o Understanding spheres of influence on land management across the food-chain. How do suppliers, markets and consumers affect UK land management and how is this likely to change in the future?
   - o Developing a greater understanding of changes in the global protein supply in response to changing demands.
   - o Understanding the factors controlling agricultural market resilience in the face of fluctuating commodity prices.
   - o Evaluating the longer term impact of the 2012 Dairy Package and voluntary industry code.
   - o Develop and assess techniques to measure the likely impact of changes to CAP farm payment schemes on the uplands.
   - o Interact with food policy on further developing genetic techniques to trace native breed sources in food products.
   - o Improving the valuation of ecosystem services, fully exploiting the National Ecosystem Assessment and follow-on activities to develop environmental accounts.

- o Identify new markets for ecosystem services and monitor their evolution.
- o Identifying potential markets for ecosystems services that could be incorporated into future agri-environment schemes.
- o Exploring synergies between farming and non-farming (e.g. recreation) socio-economic aspects of uplands policy.
- o Understanding the resilience and likely impacts of climate change on UK agriculture, land, soils, water and ecosystems. This includes the resilience of policy interventions such as agri-environment schemes.

# 4. Meeting evidence needs

**What approach(es) will be taken to meet evidence needs?**
SLS and SCFS evidence is delivered through a combination of commissioned research projects with external providers (which represents the bulk of evidence spend) and in-house expertise (covering the natural science, economic, statistics and social science disciplines) used for data collection, synthesis of existing evidence and further policy analyses. Modelling tools are being developed as part of ongoing research projects to improve capacity for in house policy analysis.

**SCFS evidence programmes:**
Sustainable and Competitive Farming Strategy evidence requirements are covered in three multidisciplinary cross cutting programmes (below). Their focus will be on combining natural science, economic, statistics and social science disciplines, levering funding from other Government Departments (including the Biotechnology and Biological Science Research Council (BBSRC) and the Technology Strategy Board (TSB)), levy bodies and industry partners to underpin sustainable and competitive farming outcomes and contribute to rural economic growth. The development, testing and use of sophisticated modelling techniques will be integral to the programmes.

1. Agriculture and climate change (SCF01): quantifying emissions from the agricultural sector and developing mitigation options including bioenergy options, especially where these contribute to gains in production efficiency.
2. Sustainable and Competitive Livestock Science (SCF02): the UK industry has fallen behind its principal competitors, both in the EU and globally, in production efficiency and business competitiveness. A review of biological and economic data and technological advances available is required to inform a more rigorous approach to industry co-funded pre-competitive applied research initiatives.
3. Sustainable Intensification of Agriculture (SCF03): drawing on social science techniques, economic models and biological systems approaches defining the optimum systems at farm, landscape and national supply chain scales that result in increased productivity and enhanced capacity to deliver ecosystem services. Individual projects in this programme will contribute to the combined SLS and SCFS Sustainable Intensification Platform described below.

**SLS evidence programmes:**
In recognition of the cross-cutting nature of Sustainable Land and Soils evidence requirements, activities are grouped in four sub-programmes (below). This provides opportunities to exploit synergies and explore trade-offs to provide a more integrated and strategic focus on land management. The programme brings together strategic research and development, monitoring and evaluation, economics, statistics, and social science.

Evidence is delivered through commissioned projects and in-house synthesis of existing evidence and policy analysis.

1. Option development (LM01): Understanding the specific problems facing land management in relation to agri-environmental and societal outcomes and developing management techniques to deliver them at the plot/field scale.
2. Integrated farming systems (LM02): Integrating interventions at farm-scale to maximise synergies and manage trade-offs between multiple agri-environmental/societal outcomes.  Work will develop decision support tools for farmers and their advisors, and provide evidence to inform the development of policy levers to achieve changes in farm management (e.g. through regulation, guidance, advice or incentives).
3. Landscape scale processes (LM03): Research to inform a more strategic approach to land management policy, e.g. by developing an improved understanding of where interventions need to be spatially targeted and the development of ecological networks.
4. Monitoring and evaluation (LM04)[3]: Monitoring the performance of environmental land management schemes, specifically agri-environment schemes.  This sub-programme is separately funded from Technical Assistance funds under the RDPE.

**Research platforms (SLS and SCFS)**
Cross-cutting evidence needs in the above sub-programmes will be delivered, where appropriate through research platforms.  A research platform in this context is a set of coordinated research activities which act as an umbrella, bringing together a community of researchers, stakeholders and policymakers to:
  o Co-design and take forward a shared research agenda
  o Share data, research sites and equipment
  o Pool funding from different sources towards long-term research objectives
  o Translate research into outputs that are of immediate policy relevance.

Bringing together the key players in this way is particularly useful for addressing questions that are broad in scope, long-term, of interest to multiple funders and require a multi-disciplinary approach.

Existing platforms include the Demonstration Test Catchments and the UK Greenhouse Gas R&D Platform, which provide a key mechanism for joining up Defra, research council and industry research on water quality and climate change respectively.

The Green Food Project recommended the development of a sustainable intensification and land use research platform. This will be developed and funded jointly between SLS, SCFS and other evidence programmes.  It will focus on the cross-cutting strategic evidence needs identified in section 3, above, drawing together research on agricultural productivity and environmental management into a coherent framework. It will bring together researchers working on the productive, environmental, social and economic aspects of farming and the food chain to address Defra's strategic evidence needs.  The platform will focus on the delivery of specific outputs, capitalising on existing research infrastructure. It will act as a vehicle for knowledge exchange and synthesis of information from other initiatives such as the Global Food Security Programme, National Ecosystem Assessment, and research council funded activities.

---

[3] Funded from the Rural Development Programme for England Technical Assistance budget.

In many specialist areas of science relevant to this joint evidence plan Defra is reliant on a relatively small pool of researchers, experts and institutes for delivery of evidence. The platform approach is beneficial in that it allows a wider range of organisations to participate in Defra funded activities than would be the case in smaller projects through collaboration with organisations with experience of policy relevant work. In particular the platforms have attracted participation of a number of academic institutes historically more engaged with fundamental sciences. The large coordinated platform projects have also offered opportunities for PhD students and scientists early in their career development to collaborate with established and influential researchers and participate in projects with significant international profile. As such, the platforms have a role in building skills and capacity for the next generation of researchers.

**Links with other programmes and external sources of evidence:**
The programmes continue to need to draw on and contribute to wider government, industry and EU research activities.  This includes co-funding, coordinating and influencing work in:
1.  Other Government research programmes, especially:
    a.  Defra (SLS; SCFS; Biodiversity; Crops; Water Quality; Air Quality; EU and CAP)
    b.  Arm's length bodies (Natural England (NE); Environment Agency (EA); Forestry Commission (FC) and English Heritage).  SLS evidence activities will contribute to Defra and the Environment Agency's evidence plan for an agricultural strategic framework on water quality and the activities of the Joint Water Evidence Group.
    c.  Other Government departments (Department for Energy and Climate Change (DECC); Dept for Business Innovation and Skills (BIS); Department for International Development (DFID); Department of Culture, Media and Sport).
    d.  Devolved administrations (Scottish Government; Welsh Government; Northern Ireland).
2.  Research Council research and knowledge exchange programmes.  This includes activities through the cross-government Global Food Security programme and the Living With Environmental Change partnership. Of particular relevance are:
    a.  Upcoming BBSRC and Natural Environment Research Council (NERC) programmes on soil science.
    b.  The NERC Macronutrient Cycles and Changing Water Cycles programmes.
    c.  The NERC pilot Environmental Virtual Observatory.
    d.  The NERC Biodiversity and Ecosystem Service Sustainability programme.
    e.  Joint NERC and BBSRC activities on industry-led Sustainable Agriculture research and innovation.
3.  EU and International initiatives, e.g.:
    a.  Collaboration with other EU member states through the CORE Organic ERA-Net to address pan-European evidence needs on organic farming.
    b.  Linking research activities with the activities of other EU countries through the Joint Programming Initiative on Agriculture, Food Security and Climate Change
    c.  Contributing to the scoping of Horizon 2020 programmes.
    d.  Participation in the Global Research Alliance on Agricultural GHG emissions
4.  Industry groups, e.g. the Agricultural and Horticultural Development Board.
5.  A major collaborative initiative with BIS and DfID, "The Agri-tech Strategy" flowing from the Green Food Project is being progressed to channel funding on agricultural science and technology into stimulating growth, not only in terms of exporting world class UK agricultural life science and technology but also to translate existing technological advances into on-farm practice to benefit rural growth and enhance competitiveness.

This will form an overarching framework to deliver new technology in support of SCFS policy objectives

6. The Technology Strategy Board Sustainable Agri-Food platform is the key vehicle for co-funding near-market research with industry.

# 5. Evaluating value for money and impact

**What approach(es) will be taken to maximise and evaluate value for money and impact from evidence?**

Evidence requirements will be reviewed and updated on an ongoing basis with evidence plans updated on an annual basis as part of the wider business planning process to ensure continued alignment with policy priorities. Evidence programmes will be formally reviewed periodically in line with Defra evidence policy.

**Success measures against which evidence will be evaluated.**

Success measures for evidence:
**Accessible** – all evidence will be accessible to a wide set of audiences. This will mean accessible through up-to-date entries, and timely publication, on the Defra R&D pages and also written in an accessible way for research professionals and also non-specialists (such as a policy audience).

**Influential** –all evidence needs to be influential and will be meet a range of objectives including strengthening UK science base and knowledge and most critically directly informing policy development and assessment.

**Respected** – all evidence needs to be of a high scientific quality, this will be assessed through detailed project assessment (prior to commissioning) and also peer reviews of final conclusions. Researchers will be encouraged to submit findings to academic journals and present at conferences.

**Procured fairly and with best practice** – all externally commissioned evidence will be procured in an open and transparent way using the correct procedures in line with the Evidence Handbook and national and EU procurement policy.

**Value for money** – all evidence will need to demonstrate good value for money and this will include increasing the value of our evidence by working in partnership with other research funders.

Evaluating the impact of the evidence on policy (and meeting the success criteria above), detailed below, will be undertaken by a mix of regular processes i.e. peers reviews, existing governance arrangements and more in-depth reviews. Evaluating the impact of the policy itself on outcomes to meet policy objectives (impact and process evaluation) have been identified within sections 2 and 3 above

**How quality/robustness and the impact of evidence on policy will be evaluated**

The impact on policy will be closely linked with quality and robustness of the evidence and some exemplars are highlighted below.

**Programme governance and assurance:**

For SLS development and delivery of the detail of the evidence plan will be undertaken by the SLS Evidence Hub consisting of Defra, Natural England and Environment Agency land management evidence specialists. A Land Management Evidence Strategy Group will have a sign-off, challenge and knowledge dissemination function. It will consist of policy leads from SLS, representatives of NE and EA and representatives of other relevant evidence programmes. It will meet twice a year to review programme outputs and progress against evidence plan, identify emerging evidence requirements, identify synergies with other Defra/ NE/ EA evidence programmes, and agree spending priorities.

For SCFS there will be regular thematic reviews of the larger groups or programmes of research which will involve evidence and policy leads, the relevant contractors and stakeholders with an interest in the evidence. The robustness of the evidence, relevance to policy, usefulness to stakeholders and value for money will form the basis of the reviews. Quarterly meetings with policy will ensure that evidence is influential to policy and regular feedback will be sought to evaluate the extent to what the evidence is meeting the policy needs.

**Working in partnership to improve effectiveness and quality**

The use of broader research platforms described in section 4 will help co-ordinate cross-cutting research activities to ensure robustness, effectiveness and value for money by defining a shared research agenda, sharing data and expertise across the platform and avoiding duplication. Key partners include the research councils where initiatives such as Living With Environment Change (LWEC) and Global Food Security (GFS) can enhance knowledge exchange activities to maximise their impact (e.g. the NERC agricultural KE programme, NERC and LWEC Knowledge Exchange Fellows).

**Knowledge exchange to promote accessible and influential evidence**

On-going sharing knowledge through international fora is necessary to ensure exploitation of available evidence and can help improve science quality e.g. to assess whether we are using the most efficient techniques and methodologies available to generate evidence to deliver value for money. Knowledge exchange activities will be embedded in all research activities and evidence specialists will co-ordinate these and link their timing to specific windows of opportunity for influencing an internal or external audience.

Internal fora will be used to disseminate the outcomes of evidence to a policy audience and clear and concise summaries of evidence activity will be produced to communicate the key findings and policy relevance.

Promoting the evidence more widely is important and this will be achieved through close liaison with colleagues responsible for press and communications to ensure effective publicising of evidence to share knowledge and demonstrate the links between evidence and policy. Specific emphasis will be focussed towards beneficial widespread publicity, for example; at the launch of new high profile projects, during established projects where important evidence has come to light, and at the end of projects where effective dissemination of results is key.