Environmental Impacts and Rural Livelihoods

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iSAGE
Innovation for Sustainable Sheep and Goat Production in Europe
Current Support under CAP

1. Direct Payments under ‘Pillar I’ (€3.1 billion in the UK in 2016),
   1. Basic Payment Scheme (BPS)
   2. ‘Greening’ component which is 30% of the Direct Payment total
   3. Young Farmers Scheme

2. Also under Pillar I, mostly market management measures.

3. ‘Pillar II’ (€0.8 billion in 2016), is for rural development schemes which include agri-environmental measures.
Health and Harmony: the future for food, farming and the environment (UK Government February 2018)

• payment of public money for the provision of public goods.
• goals set out in the 25 Year Environment Plan
• pays providers for delivering environmentally beneficial outcomes;
• deliver benefits such as improved air, water and soil quality; increased biodiversity; climate change mitigation and adaptation
Populations of specialist and generalist farmland birds in England, 1970 to 2017

British Trust for Ornithology, Defra, Joint Nature Conservation Committee, Royal Society for the Protection of Birds.
A framework for improving the environment

**Drivers / Pressures**
- Climate change
- Waste & poor resource efficiency
- Pollution / chemicals
- Biosecurity

**WHAT we want to achieve**

**Assets**
- For example:
  - Atmosphere
  - Freshwater
  - Land
  - Species
  - Ecological communities
  - Soil
  - Geological assets
  - Oceans

**Other capital inputs**

**Goods and benefits**
- For example:
  - Clean air
  - Clean and plentiful water
  - Terrestrial and marine plants and wildlife
  - Protection from hazards
  - Products from natural resources
  - Beauty, heritage and engagement (including recreation)

**WHY**
- A strong economy and improved health and wellbeing

**HOW are we going to take action and improve the environment within a generation?**
- Policies
- Management actions
- Investments
- Governance and institutions

*Other capital inputs include manufactured capital (e.g., buildings and machines), human capital (e.g., labour and education) and social capital (e.g., rules and procedures)*
UK Government 25 yr Environment Plan
(updated May 2019)

• restoring 75% of our one million ha of terrestrial and freshwater protected sites to favourable condition
• creating or restoring 500,000 hectares of wildlife-rich habitat outside the protected site network
• taking action to recover threatened, iconic or economically important species of animals, plants and fungi
• ensuring that food is produced sustainably and profitably
25 yr Plan - Woodland

• increasing woodland in England in line with our aspiration of 12% cover by 2060: this would involve planting 180,000 hectares by end of 2042.
• Last year 13,400 (mainly Scotland, 11,000)
  But uprated
• Committee on Climate Change - 1.5bn trees would be needed by 2050 as part of zero C,
• equivalent to an area of 30,000 hectares every year, with 15% of crop land turned to tree-planting and growing plants for fuel by 2050
Government Policy - Biodiversity

• In 2011, the government published *Biodiversity 2020: A strategy for England’s wildlife and ecosystem services*. Set Strategic Direction

• *Biodiversity 2020 Indicators* published assessments of progress on 24 indicators of biodiversity including those associated with farmland
# Biodiversity Assessment (Species in the wider countryside: farmland)

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<thead>
<tr>
<th></th>
<th>Long Term</th>
<th>Short term</th>
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<tbody>
<tr>
<td>Breeding farmland birds</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Butterflies</td>
<td>X</td>
<td>=</td>
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<tr>
<td>Bats</td>
<td>✓</td>
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<tr>
<td>Plant diversity</td>
<td>Not assessed</td>
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Average effective population size \( (N_e) \) of Native Breeds at Risk in the UK, 2000 to 2018

effective population size \( (N_e) \) equal to 50; the level set by FAO as a threshold for concern.
Breed variation

• 18 breeds have had an increase in Ne (for example, Boreray, Shropshire, Hebridean, and Castlemilk Moorit)
• 5 a decrease (Black Welsh Mountain, Border Leicester, Cotswold, Manx Loaghtan and Whitefaced Woodland),
• 2 breeds stable (Llanwenog a 1% decrease and Norfolk Horn a 5% increase).
Public sector expenditure on biodiversity in England, 2000/01 to 2017/18 (real terms)

Defra, HM Treasury
Management of Grassland is key to meeting environmental targets.

Grass/ Forage comprises 90 to 95% of the diet of sheep.
UK grasslands

Total UK agricultural area is 17.5 million Ha
Grasslands comprise 12.4 million Ha (71% of total)
Of this
• 10% Temporary Grassland (<5yrs)
• 80% Permanent Grassland, of which
  • 60% is Grassland over 5 yrs and
  • 40% Single owner Rough Grazings
• 10% Common Rough Grazings

(DEFRA Farming Statistics, 2017)
Wide range of species composition

- Temporary grasslands - intensive single species
- Species rich meadows
- Permanent grasslands
- Rough grazings – semi natural
Livestock Production

Grasslands support production from
• 35 million Sheep
• 10 million Cattle
• 2 million Dairy Cows
Grassland farms

• produce 36% of UK agricultural output amounting to £8 billion,
• have the greatest number of holdings and employ the largest number involved in agriculture (e.g. 31% of agricultural workforce in England).
• but have a high reliance on subsidy (over 90% of income from Direct Payments in beef/sheep)
• even so 66% of grazing LFA farms and 75% of lowland grazing had profits less than £25k per annum
• wide range in performance (ratio >2 between top and bottom 25%)
Potential Strategies

**Aim: Enhance environment within context of profitable farming**

- Increase efficiency on high potential pastures (same or increased output with fewer ha - how?) to release land for delivery of public goods (biodiversity/woodlands/ win-win GHG.)
- Greater incorporation of grassland into arable rotations
- Silvo-pastoral systems
- Improve management of grasslands to deliver biodiversity
The Opportunity  (Mayne and O’Mara, 2018)

• Significant underutilization of UK grassland is costing the UK ruminant livestock sector in excess of £1600 m per annum - this represents 50% of current subsidy support.
Silvo-pastoral systems - needs

- Practical research to demonstrate tangible operational and economic benefits and communication of these benefits to farmers;
- Providing the right policy and support mechanisms to facilitate new uptake; (Trees and Sheep initiative Scottish Forestry)
- Building a critical mass of farm innovators to demonstrate benefits to peers.

https://www.adas.uk/News/the-potential-of-agroforestry-in-uk-agriculture
Semi-natural rough grazing

More structural heterogeneity

Increased floristic diversity

Improved habitat value

I = commercial sheep grazing (2.72 ewes ha\(^{-1}\))

II = low intensity sheep grazing (0.91 ewes ha\(^{-1}\))

III = low intensity mixed-herbivore grazing with equivalent off-take to treatment II

IV = no grazing

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<tr>
<th>TREATMENT</th>
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<th>II</th>
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<tr>
<td>Plants</td>
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<td>Arthropods</td>
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<tr>
<td>Herbivorous rodent</td>
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<td>Insectivorous bird</td>
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<td>Mammalian carnivore</td>
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Agriculture is relatively more important in remote rural areas but economies dominated by service sectors.

Growth is increasingly dependent on sectors linked to natural environment e.g. tourism, renewables (underpinned by farming)

High reliance on transfer (“unearned”) income from other areas e.g. pensions, non-local income, investments, public sector funding, farm subsidies and structural funds
Multifunctional grasslands

They have potential through

• better targeted support,
• new technology and innovative practices

To deliver

• a successful rural economy
• a healthy natural environment,
• improved productivity
THE END

THANKYOU
Grass Enhances Beneficial Omega-3 in Lamb and Beef

(Scollan et al 2017)
3. Revised in 2015 to reflect improved modelling of greenhouse gas emissions and removals.

Figure 9.2: Annual net removals of greenhouse gases by forests in England, 1990 to 2017
Soil pH – UK Grassland Soils

Source: Fisher, 2013

- 5 – 30% DM yield loss!
- Reduced nutrient efficiency!
Public engagement; Percentage of respondents engaging with pro-environmental behaviours, 2009/10 to 2017/18 (Natural England)

- I usually recycle items rather than throw them away
- I choose to walk/cycle instead of using my car when I can
- I usually buy seasonal / locally grown food
- I encourage other people to protect the environment
- I usually buy eco-friendly products and brands
- I am a member of an environmental/conservation organisation
- I volunteer to help care for the environment

Percentage of respondents