The Circular Economy & Sustainable Agriculture:

A UK Perspective

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Agriculture in the UK
Some Key Facts

- The UK Agri-food sector accounts for 7% of the total economy (2007), and provides 14% of the total workforce (3.6 million jobs). Farming contributes 0.5% to GDP (2007), and 1.7% to employment.
- Farmers manage 70% of England's land (80% of rural land), thus having an important impact, both positive and negative, on the natural environment .
- Farming contributes approximately 60% of nitrates, 25% of phosphorus and 70% of sediments entering our waters; as well as 7% of the UK's GHG emissions (37% of the UK's methane emissions and 63% of nitrous oxide – both much more potent than CO_2).

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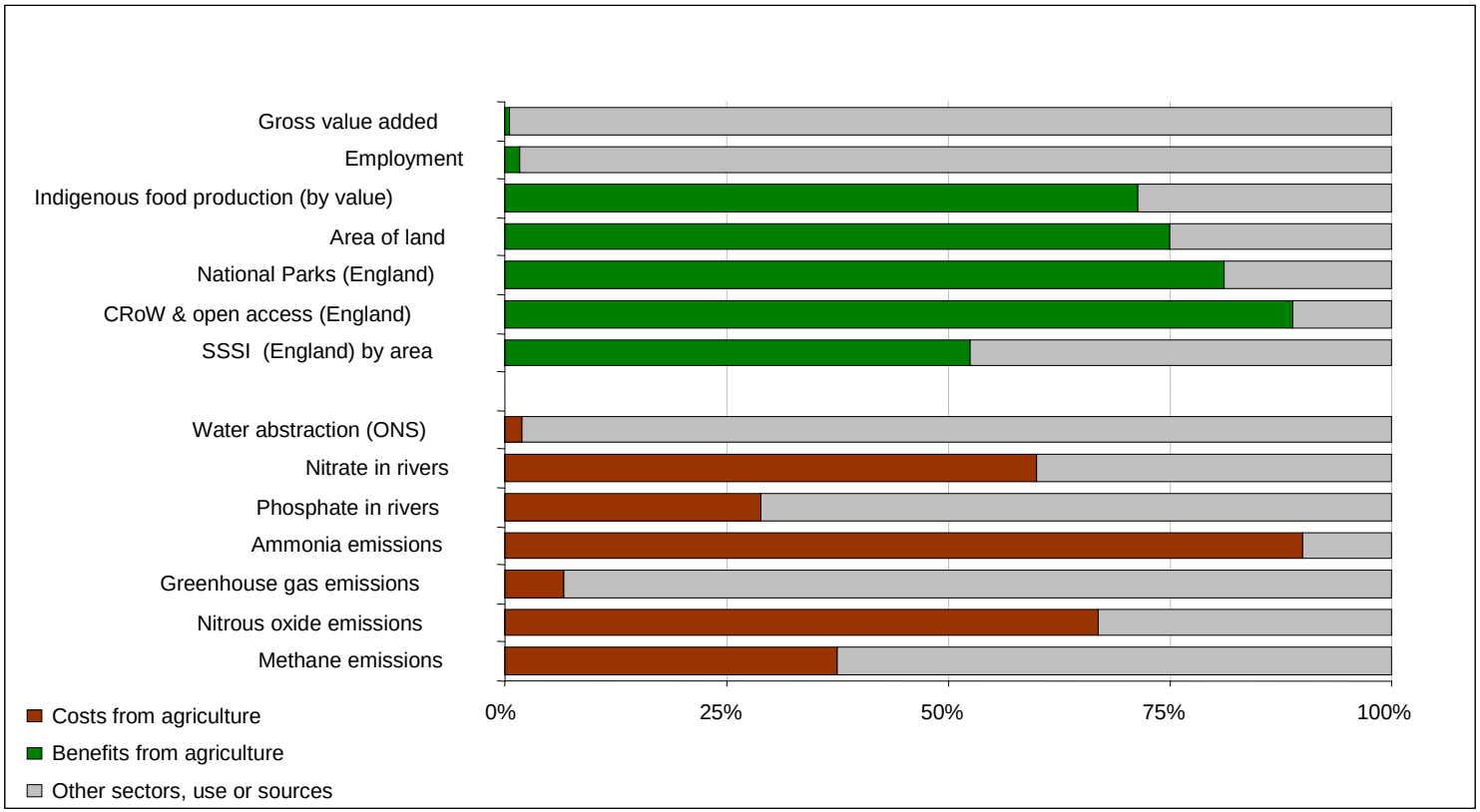
Environmental Profile of the Agricultural Sector



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Defra's 8 Strategic Objectives (DSO)

1. **Climate change tackled internationally and through domestic action to reduce greenhouse gas emissions**
2. **A healthy, resilient, productive and diverse natural environment**
3. **Sustainable patterns of consumption and production**
4. **Economy and society resilient to environmental risk and adapted to the impacts of climate change**
5. **A thriving farming and food sector with an improving net environmental impact**
6. Sustainable Development championed across government, across the UK, and internationally
7. **Strong rural communities**
8. A respected department delivering efficient and high quality services and outcomes.

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Defra's Farming for the Future Programme

- Our long term vision for English farming is of ***a sector which contributes now and in the future to both environmental and food security, because it:***
  - ***is profitable, competitive and sustainable in domestic and international markets;***
  - ***is respected and rewarded by consumers for the quality, safety, and environmental and animal welfare standards of the food and other products it produces;***
  - ***embraces its environmental responsibilities – tackling climate change, managing water, air and soil – and sees them as essential to its long term economic success, rather than a threat to it;***
  - ***sustainably manages landscape and biodiversity within agreed regulatory frameworks, and is properly rewarded by society for the provision of additional public benefits;***
  - ***works together collaboratively to meet the challenges it faces, and which manages risks, in doing so increasing its resilience and building its capacity to resist future external shocks.***
- The **Farming for the Future Programme** is focussed on **key priorities** which will deliver the behaviour change necessary to realise that vision, at the same time setting a new direction for the relationship between Govt and industry.

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Nutrient Management

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Nutrient Management to protect soil, water and air

- Careful management of livestock manures can:
  - reduce losses of ammonia and other gases to the atmosphere;
  - limit nitrate leaching to groundwater;
  - avoid excessive build up of nutrients and contaminants in soil; and
- Changing what is in animal feed will change the resulting manures and so:
  - reduce surplus nitrogen being lost to the environment;
  - limit the unnecessary accumulation of phosphorus in the soil which will reduce impact on the water environment; and
  - reduce the risk of contaminating soils with feed supplements, such as copper and zinc
- Following a **nutrient management plan** will ensure efficient use of fertilisers (and organic manures) and can:
  - limit nitrate leaching to surface and groundwaters;
  - prevent the unnecessary accumulation of phosphorus in the soil and water; and
  - reduce the risk of nitrous oxide emissions to the atmosphere.

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Nutrient Management Policy in Defra

- Defra is working with to develop an integrated approach to nutrient management policy, including **effective management of trade-offs between environmental and economic objectives**.

- Defra aims to **increase the efficiency of nutrient use on farm** and **reduce net environmental pollution from agriculture.**

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Nutrient Management Policy in Defra

- **Defra is:**

  - Supporting industry to develop Nutrient Management Plans. The objective is to obtain industry and government consensus on the key elements of nutrient management planning on-farm.
  - Publishing The Fertiliser Manual in partnership with the crop nutrition research community. An evidence based publication that will act as a key point of reference in support of a range of policies aimed at improving nutrient management on farms.
  - Publishing the Code of Good Agricultural Practice (CoGAP). CoGAP is a practical guide to help farmers, growers and land managers protect the environment in which they operate. Offering interpretations of legislation and advice to help farmers avoid reduce pollution and protect their natural resources.

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Anaerobic Digestion

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Benefits of Anaerobic Digestion

- The anaerobic digestion of manures and slurries can reduce methane emissions from manure management.
- These can be co-digested with food waste from within the food chain, reducing methane emissions from landfill.
- Anaerobic digestion produces biogas that can be used for heat and power or as a transport fuel.
- The electricity and heat produced can be used on the farm, eliminating the need for energy from fossil fuels. The surplus energy can be sold.
- The treated material can be used on the farm as a highly stable, nutrient-rich, liquid bio-fertiliser. This reduces the need to purchase fossil fuel derived fertilisers.

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Biogen

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Biogen

- The Biogen anaerobic digestion plant is located on a farm with 4,800 pigs.
- An underground pipeline feeds the slurry from the pig finishing unit to the anaerobic digestion plant. This is mixed with food waste from food manufacturers, retailers and local authorities.
- The biogas produced is used to power a CHP unit. The heat generated is used as part of the process and the electricity generated is sold back to the National Grid. This is enough to power roughly 1,000 homes.
- The digestate is used on the farm's arable land as biofertiliser. As a result, the farm no longer needs to purchase fossil fuel derived fertilisers.

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Biogen

- **Inputs**
- Feedstock: c 40k tonnes of which
  - Slurry: 12k tonnes
  - Food waste: 30k tonnes
- **Outputs**
- Electricity: 1.1 MWe
- Heat: 1.6 MWt
- Biofertiliser: 30k

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Water

Catchment Sensitive Farming

- In February 2008 Defra launched ‘Future Water’, the Government’s new Water Strategy for England. Defra will continue to support farmers on catchment sensitive farming for a further three years.
- The England Catchment Sensitive Farming Delivery Initiative will receive funding of £12.9 million in 2008-09.

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Research & Development

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R&D in Defra

- R&D an important part of the developing the evidence base for policy development
- About £5m for climate change and agriculture projects over 3 years
- £2.2m for efficient use of water projects over 5 years. Projects include:
  - Benchmarking water use in key commodity sectors
  - Best practice and new technology for water use
- £5.4m for nutrient management projects over 5 years. Projects include:
  - Improved mineral fertilizer timing strategies
  - Improved understanding of the nitrogen cycle in agriculture systems

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International Co-operation

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UK committed to international co-operation…..

- Defra working closely with MOA to develop a joint Work Programme on Sustainable Agriculture and Fisheries, under the China-UK Sustainable Development Dialogue. The Work Programme includes the six workstreams:

1. Agricultural sustainability strategies, policies and approaches
2. Agricultural biomass utilisation and biogas
3. Sustainable global fisheries, with particular reference to UK and China sustainable consumption and production
4. Management of agro-chemical inputs, with particular reference to non-point source pollution
5. Addressing climate change mitigation and adaptation
6. Ecosystem services and poverty alleviation.

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China-UK Sustainable Agriculture Innovation Network (SAIN)

- A new network to contribute to the achievement of a resource efficient, low carbon economy and an environmentally friendly society.
- SAIN's objectives:
  - Support the implementation of the UK-China SDD by fostering innovation in three areas: policy development; institutional mechanisms for collaborative research; and translating policy and science into practice on the ground;
  - Stimulate innovative thinking and research on all aspects of environmentally sustainable agriculture and its relation to the local, national and global economy;
  - Communicate information on environmentally sustainable agriculture issues and opportunities for change, and disseminate best practices to key audiences;
  - Contribute to global sustainability through wider sharing of expertise between developed and emerging economies.

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