Foresight Land Use Futures
Making the most of land in the 21st century

Agriculture: a suitable case for treatment

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Long term challenges for land use

• Population changes
• Economic growth and affluence
• Climate change
• Transport and infrastructure
• Energy
• Food security
• Living within environmental limits
Agricultural futures:

• Food security
• Climate change and environmental limits
• Technology
• Multiple benefits and rewards
• Policy – if the CAP fits...

Proportions of land use in 2005

Definitions of food security

“Food security is consumers having access at all times to sufficient, safe and nutritious food for an active and healthy life at affordable prices”

Defra (2008)
Global demand: more people and more food per capita

Predicted global commodity consumption per person by major food groups from 1970 to 2000 (actual data) and from 2010-2050 (predicted data) (FAO, 2006, pg 25). Note that each kg increase in milk or meat, requires an addition 5 to 8 kg of animal feed. Compiled by P Burgess
E &W : Land resources and use

grade

use

Source : CEH, Defra, WAG: and EA /LUC 2009
UK Agricultural Performance: Trends

Based on Defra sources:
Value of UK barley and crude oil on a per unit energy basis (derived from Defra and US EIA data, 2010)
Future Agriculture: supply side?

Farm Yields

Policy?

- Price support, grants, gov’t research, agrochemicals, plant breeding
- Low gov’t support

1900  2000  2100

- Wheat, poultry
- Potatoes, milk
- Beef, rape

- 75 - 120%
- 80 - 130%
- 120 - 180%

World Markets  Global Sustainability
National Enterprise  Local Stewardship
## Agricultural Scenarios: E&W 2050

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Intervention regime</th>
<th>Relative change in technical efficiency*</th>
<th>Relative change in self sufficiency</th>
<th>% change in land use for agric**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bau</td>
<td>As per 2002</td>
<td>+19%</td>
<td>+6%</td>
<td>-20%</td>
</tr>
<tr>
<td>World markets</td>
<td>None: Market-driven free trade</td>
<td>+34%</td>
<td>-3%</td>
<td>-34%</td>
</tr>
<tr>
<td>National enterprise</td>
<td>Moderate: Protected domestic markets with limited environmental concern</td>
<td>+39%</td>
<td>+26%</td>
<td>-18%</td>
</tr>
<tr>
<td>Global sustainability</td>
<td>Low: Internationally competitive agriculture moderated by targeted compliance</td>
<td>+12%</td>
<td>+8%</td>
<td>-2%</td>
</tr>
<tr>
<td>Local stewardship</td>
<td>High: locally defined schemes reflecting local priorities</td>
<td>-7%</td>
<td>+23%</td>
<td>0%</td>
</tr>
</tbody>
</table>

* Based on yield increases for 5 crop and 5 livestock commodities. **Excludes bio-energy crops

Source: Burgess and Morris, 2009, based on Morris et al, 2006, Agricultural Futures and Implications for the Environment, Defra Research Project IS0209
Climate change and agriculture: changing use and value?

Potential changes in summer growing conditions (after EA, 2009)
Role of agricultural technology

New and improved technology is an important driver of growth. Schematic diagram showing how a farmer uses land, labour, finance, energy, genetic improvement and husbandry methods as key inputs to a farm production system which results in outputs such as products, waste, environmental services and information (Burgess and Morris, 2009)
Synergies and trade-offs

Achieving multiple objectives in ways that appeal to stakeholders?

References

- Rural Economy and Land Use Programme. [www.relu.ac.uk](http://www.relu.ac.uk)