Current Agriculture / Land Use Policy in Ireland – Is Climate Change a consideration?

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(2016 data unless specified)

- **Agricultural Land** – 4.5m ha
  - Grassland: 3.563m ha (91%) – mainly permanent pasture
  - Crops: 0.352m ha (9%)

- **Forest** – 0.74m ha

- **Livestock**
  - 7.2m Cattle
  - 5.2m sheep
  - 1.6m pigs
  - 10.1m chickens

- **Agri-food in the economy**
  - 7.6% GVA (2016)
  - 8.6% employment (including 140,000 family farms) (2016)
  - 10.3% of exports (2016)
Ireland’s farming landscape

- Total number of farmers – 139,600
- Average farm size – 32.5 ha
- Total area farmed (000ha) – 4,536
- Grass based production system
- Long growing season
- Long grazing season
#FoodWise2025 Strategy

Increase the value of agri food exports by 85% to €19 billion

Increase value added to the sector by 70% to €13 billion

Increase the value of primary production by 65% to €10 billion

Deliver a further 23,000 jobs in the agri food sector by 2025
GHG & Ammonia Emissions

- Irish Agriculture accounts for 33% of Irish national emissions (EU = 9%)
- Due to small industrial base to ‘dilute’ agricultural emissions – allied to proportionally large livestock sector
- 80% of ammonia from dairy and beef
- Remainder from pig and poultry

Ammonia

Agriculture 98%

Waste 1.7%

Energy 19.7%

Residential 10.1%

Manufacturing 7.6%

Transport 19.8%

Services 2.9%

Industry 3.3%

F-gases 1.9%

Agriculture 33%
Irish Emissions Profile

- GHG dominated by methane from enteric fermentation
- Nitrous oxide associated with 32% of emissions
- CO2 only comprises 1.5% emissions
Improvements in Production capacity

- Agri-food exports increased 56% since 2009
- Dairy production increased 26% since 2009
- EU forecasts 41% increase in Irish dairy output up to 2026
The Challenges

- **GHG targets:**
  - 20% emissions reduction by 2020
  - 30% non-ETS reduction by 2030 (2030 Effort Sharing)

- Both GHG and ammonia emissions projected to increase by 2030

- **Ammonia targets:**
  - 1% reduction to 2030
  - 5% from 2030 onwards
  - ammonia mitigation can be synergistic or antagonistic with GHG mitigation

- **Nitrates/WFD targets:**
  - Need to improve water quality/reduce nutrient inputs

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![GHG Emissions Graph](image1)

- For 30% reduction need to be at dotted line

![Ammonia Emissions Graph](image2)

- 5% reduction
- FW2025 SGS (WAM)
- FW2025 SGS

![Nitrates/WFD Graph](image3)
Sustainability

- Sustainable growth has become a central issue
  - Regulatory requirement and marketing opportunity
- Means different things to different people
  - Environment
  - Economic
  - Social
- Need pragmatic balance between economic growth and environmental concerns
  - Concern for environmental targets
  - But also concern for life quality in rural Ireland
Economic and Social Sustainability

- Gross Output and Margin (per ha.)
- Family Farm Income (per labour unit)
- Market Orientation (% of output from market)
- Economic Viability

- Ability to earn minimum wage, and 5+% return

- High Age Profile
- Isolation Risk
- Hours Worked on Farm
- Household vulnerability
  - Lack of economic viability + no off-farm employment

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![Graph showing household vulnerability across different farming activities.](image-url)
GHG & Nitrogen Intensity

- Emissions efficiency of production important to highlight
- N balance critical for GHG, ammonia and water quality
Carbon Footprint of Irish produce compared to 1990

($CO_2e$ per calorie, $1990 = 1$)

- **historic data**
- **projection (FAPRI-IRL model)**
Environmental Sustainability

- **Biodiversity**: Produced as part of a Teagasc-funded project on habitat surveys of Irish farmland in collaboration with Bord Bia.

**Water Quality**: Improve resource-use efficiency – ACP validating water quality impacts

Heavy soils programme – will reduce P runoff on vulnerable soils
Water Quality

Nitrates in water declining

Phosphorous in water declining

...But in terms of ecological status - 418 river water bodies exhibited an improvement 499 river water bodies declined in status

The Solutions

- Fertilisers and nutrient use – Protected urea can reduce $N_2O$ substantially, while BY improving liming, N & P-use fertiliser inputs can be reduced
- Manure additives can reduce ammonia and methane by over 90%
- Animal genetics, extended grazing and diet reduce methane

But need effective knowledge transfer - and these reductions won’t be enough…..
Carbon sequestration

- Offsets emissions as plants remove CO$_2$ from atmosphere
- Large amounts held in woody biomass (forests) for 40-100 years
- Soil carbon can remain *in situ* for 100’s years – depending on soil type!
- Ploughing for tillage production releases large amounts of C to the atmosphere. CO$_2$ release can range from 5-35 tonnes CO$_2$ per annum over a 30 year period depending on soil type
- Can use these ‘sinks to offset 5.6% of all national emissions ….but forestry planting rates need to be increased
Smart Land Use and Land management optimisation is required

- Enhance grassland and cropland sinks through optimal management
- Maintain forestry sinks
- Plug carbon hotspots – water table manipulation on marsh organic soils
- Enhance biodiversity
Current schemes/measures

- **Green, Low Carbon Agri-Environmental Scheme (GLAS):**
  - Preserve traditional hay meadows and low-input pastures.
  - Habitat preservation and practices such as minimum tillage;
  - Apply agricultural production methods compatible with the protection of the environment, water quality, the landscape.

- **Targeted Agricultural Modernisation Scheme (TAMS 2):**
  - Low Emission Slurry Spreading Equipment Scheme
  - Organic Capital Investment: Rainwater harvesters and equipment to encourage uptake of organic farming
  - Water meters, solar panels, etc. for pig/poultry
  - Upgrade housing facilities

- **Good Agricultural Environmental Conditions (GAEC):**
  - Maintain soil carbon and ground cover
  - Establishment of buffer strips along watercourses
  - Protection of ground water against pollution
Irish GHG Research

- One of the few countries that have accurate reporting of agriculture emissions
- Large amount of research in agricultural GHG – recognised as world leaders in GHG research
- Integral member of Global Research Alliance on Agricultural GHG, are leading a large European GHG/forestry research initiative (ERA-GAS) and IPCC report on climate and land-use
Knowledge transfer

- Better farms
- NMP online
- PastureBase – improve grass growth & utilisation
- Carbon navigator
Mainstreaming Sustainability to farmers: The Carbon Navigator

- Partnership approach: Teagasc & Bord Bia
- Online software to assist farmers:
  - To understand how their farms produce GHG emissions
  - To identify mitigation capacity
  - To set targets and a pathway to reduce emissions