Agenda Item No:	10	
Committee:	**Rural and Farming Executive Advisory Committee**	
Date:	13 March 2024	
Report Title:	**Climate Impact Assessment for Farming**	

Cover sheet:

1 Purpose / Summary

1.1 Rob Wise, Environment Adviser for National Union of Farmers, is attending committee to provide members with a verbal update on how local farmers are managing climate adaptation, specifically in relation to the unique Fens environment. To support this conversation, members are presented below with a summary of a recent report from Defra for their information.

1.2 Defra have published their annual Agri-climate Report which presents the latest available estimates on the greenhouse gas statistics for farming.

1.3 The Defra report is summarised here and sets out the trends in agricultural greenhouse gas emissions over the past 30 years and the results of the 2023 Farm Practice Survey questions relating to farmers intentions and actions on this topic.

2 Key Issues

2.1 The report indicates that total agricultural greenhouse gas emissions have decreased by 12% between 1990 and 2021.

2.2 The 2023 Farm Practices Survey indicated that 62% of farmers thought it important to consider greenhouse gases when making farm business decisions, while 32% considered it as not important.

3 Recommendations

3.1 Members note the content of this summarised Defra report in relation to the changes in farming practices and the motivators therein.

Wards Affected	All
Forward Plan Reference	
Portfolio Holder(s)	
Report Originator(s)	Mark Mathews Head of Environmental Services
Contact Officer(s)	Peter Catchpole Director and S151 Officer

Background Papers	https://www.gov.uk/government/statistics/agri-climate-report-2023/agri-climate-report-2023

4 BACKGROUND

4.1 This annual DEFRA report sets out the trends in estimated agricultural greenhouse gas (GHG) emissions over the past 30 years (in overview) and the results of the 2023 Farm Practice Survey questions relating to farmers intentions and actions on reducing GHG emissions.

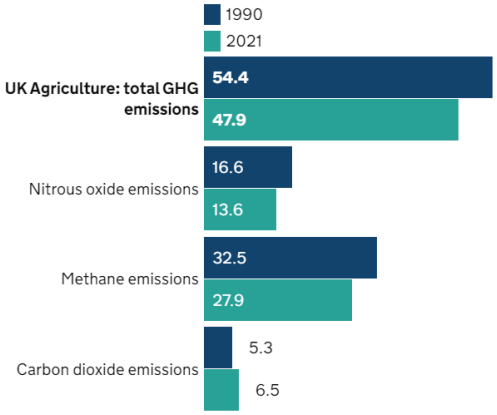
4.2 Agriculture contributes to emissions of Green House Gases nitrous oxide, methane and carbon dioxide. It is attributed as a major source of both nitrous oxide and methane emissions in the UK, accounting for 71% of total nitrous oxide emissions and 49% of all methane emissions in 2021.

4.3 In contrast, agriculture only accounted for about 1.9% of total carbon dioxide emissions. Agricultural carbon dioxide emissions come from livestock, agricultural soils, stationary combustion sources and off-road machinery.

4.4 Between 1990 and 2021, greenhouse gas emissions from agriculture decreased by around 12%. This occurred mainly during the 2000s, due to a fall in animal numbers and a decrease in synthetic fertiliser usage, and since then emissions have remained at a similar level.

Change in GHG emissions, 1990 - 2021

Figure 1.1 UK estimated Green House Gases (GHG) emissions for agriculture, 1990 and 2021 (million tonnes carbon dioxide equivalent, $MtCO_2e$)

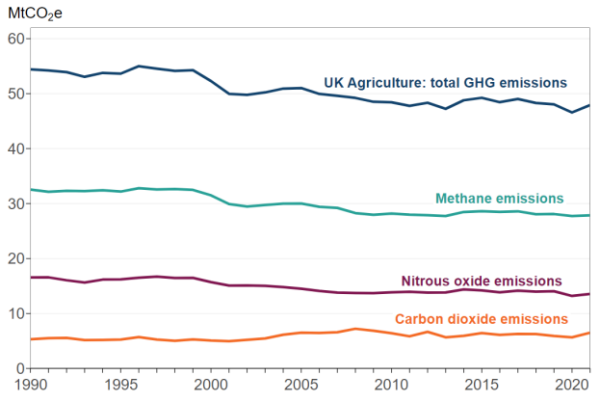


4.5 The change in emissions for GHGs between 1990 and 2021:

- Total GHGs decreased by 12%
- Nitrous oxide decreased by 18%
- Methane decreased by 14%
- Carbon dioxide increased by 22%

Total emissions

Figure 1.2 GHG emissions from UK agriculture ($MtCO_2e$)

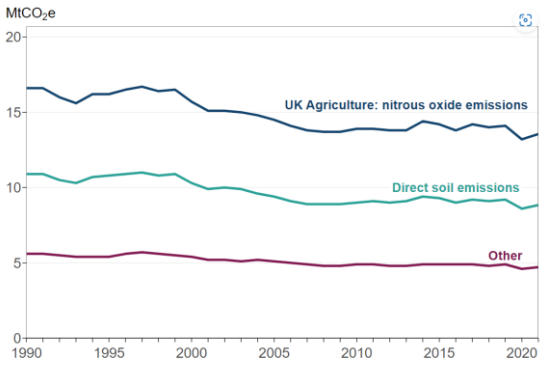


4.6 Figure 1.2 provides an overall picture of the level of estimated GHG emissions from agriculture. In 2021, when compared to total emissions from all sectors, agriculture was the source of:

- 11% of total GHG emissions in the UK
- 71% of total nitrous oxide emissions
- 49% of total methane emissions
- 1.9% of total carbon dioxide emissions

Nitrous oxide emissions

Figure 1.3 Emissions of nitrous oxide from UK agriculture by source ($MtCO_2e$)



Notes:

1. 'Direct soil emissions' consists of leaching/runoff, synthetic fertiliser, manure as an organic fertiliser, atmospheric deposition, improved grassland soils, crop residues, cultivation of organic soils, N-fix crops, deposited manure on pasture (unmanaged).

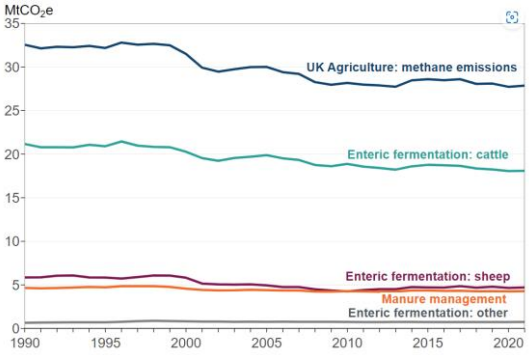
2. 'Other' includes: stationary and mobile combustion, wastes and field burning of agricultural wastes.

4.7 The total emissions of nitrous oxide from agriculture in 2021 was 13.6 MtCO2e, up 2.7% from 2020. Agriculture is estimated to be responsible for 71% of total nitrous oxide emissions in 2021, similar to 2020 levels. The majority of agricultural nitrous oxide emissions come from soils, particularly as a result of nitrogen fertiliser application, manure and leaching/run off.

4.8 The fall in estimated nitrous oxide emissions (18%) over the last twenty years has been driven by substantial reductions in the overall application rate for nitrogen fertilisers, particularly to grassland, whilst arable application rates have remained relatively stable. The decline in cattle numbers is thought to have contributed to the decrease of nitrogen use on grassland, possibly in conjunction with improvement in manure use efficiency. After the decline in emissions up to around 2006, levels have since remained fairly similar

Methane emissions

Figure 1.4 Emissions of methane from UK agriculture by source ($MtCO_2e$)



Notes:

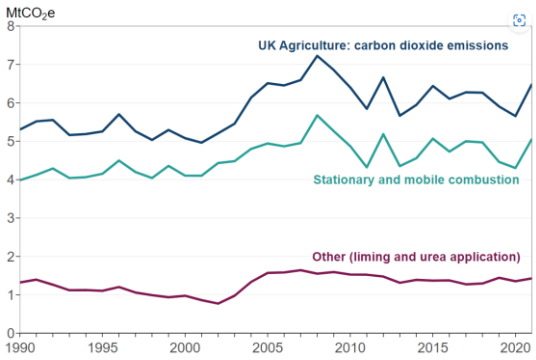
1. 'Enteric fermentation: other' is goats, horses, pigs and deer.
2. 'Manure management' is the sum of wastes from livestock (cattle, dairy, sheep, pigs).

4.9 The total emissions of methane from agriculture in 2021 was 27.9 MtCO2e, an increase of 0.5% on 2020. Agriculture is estimated to have been the source of 49% of the UK's methane emissions in 2021, compared with 48% in 2020. Methane is produced as a by-product of enteric fermentation and from the decomposition of manure under anaerobic conditions.

4.10 The majority of the fall in estimated methane emissions since 1990 (14%) is due to reductions in the numbers of cattle and sheep in the UK. However, since 2009 the long-term fall stalled, and methane emissions have remained at similar levels.

Carbon dioxide emissions

Figure 1.5 Emissions of carbon dioxide from UK agriculture by source ($MtCO_2e$



4.11 In contrast to nitrous oxide and methane, to which agriculture contributes a large proportion of total emissions, only 1.9% of carbon dioxide emissions (6.5

MtCO2e) in the UK were attributed to agriculture in 2021, a similar proportion to 2020. Emissions of CO2 from agriculture relate mainly to fuel use. Since 1990, there has been an overall increase (22%) in estimated carbon dioxide emissions from agriculture.

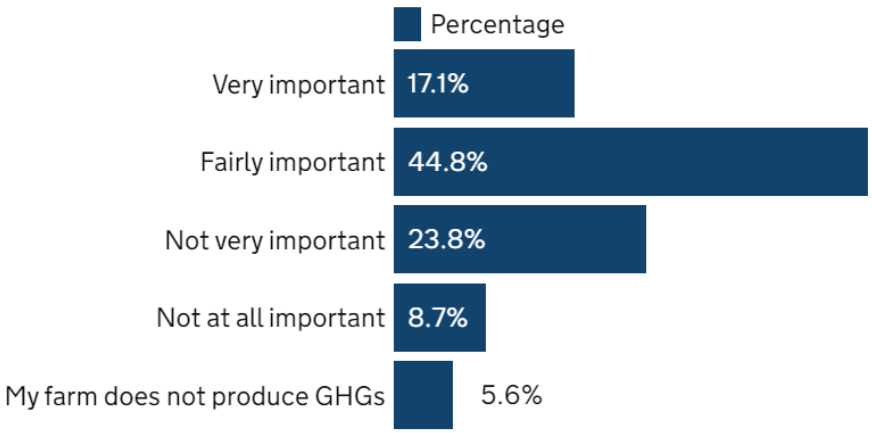
Farmer attitudes and uptake of on-farm mitigation measures in England

4.12 The following section provides key summary statistics on farmer attitudes and views on GHGs and their uptake of a range of mitigation measures. It links to data on farmer understanding and awareness of actions towards reducing GHG emissions.

4.13 Understanding what practices are adopted, and why, can help to highlight motivations, barriers and provide an indication of the ease with which mitigation measures can be actioned. However, improving understanding and attitudes towards GHGs are not a guarantee of the adoption of mitigation practices, as business sustainability and financial implications are also important drivers for change.

Awareness of Greenhouse Gas Emissions

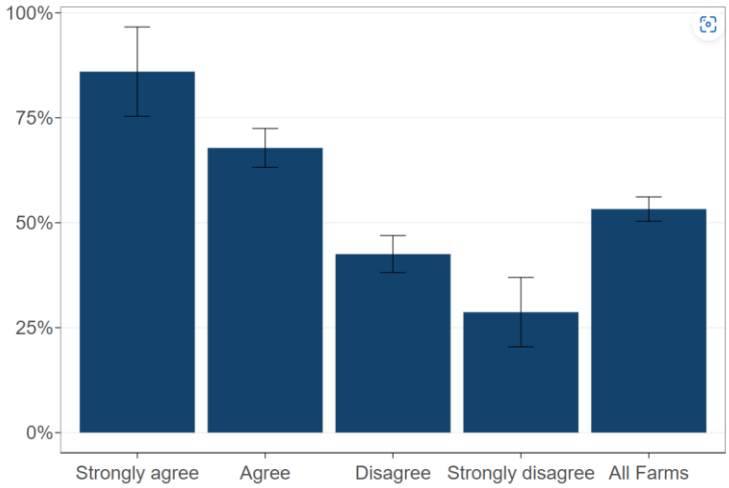
Figure 3.1 How important is it to consider GHGs when taking decisions about crops, land and livestock?



Source: Farm Practices Survey 2023 – greenhouse gas mitigation practices (https://www.gov.uk/government/collections/farm-practices-survey)

4.14 The 2023 Farm Practices Survey (FPS) indicated that 62% of farmers thought it important to consider GHGs when making farm business decisions, while 32% considered it not important. There were a relatively small number that believed their farm did not produce GHGs (5.6%). Mixed and dairy farms placed the greatest importance on GHGs, while grazing livestock farms placed the least importance.

Figure 3.2 Proportion of farms taking action to reduce GHG emissions categorised by their views on whether taking action will improve farm profitability



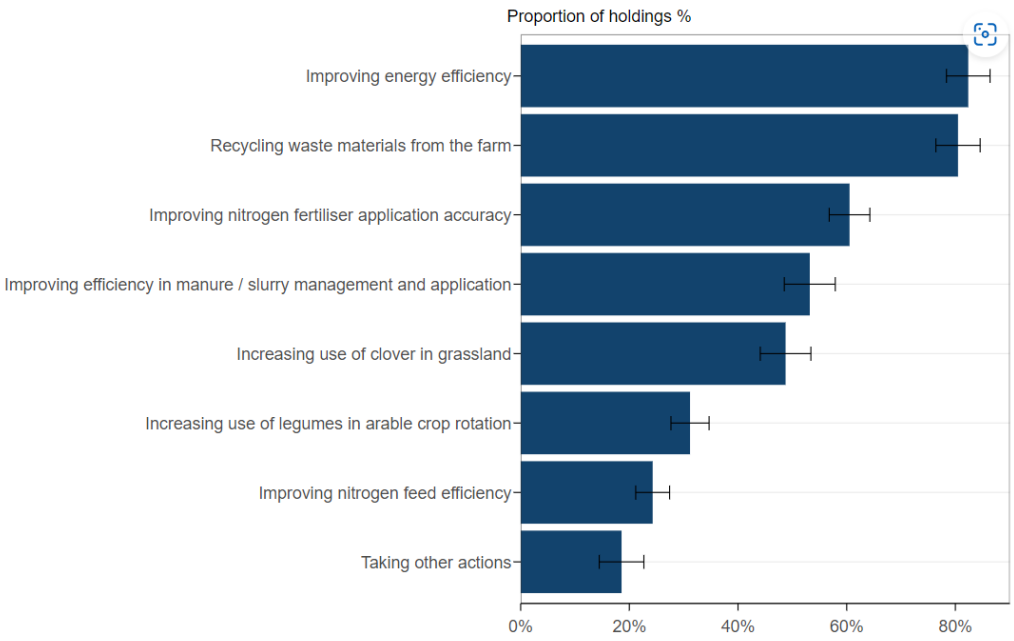
Source: Farm Practices Survey

4.15 In 2023, 44% of farmers thought that reducing emissions would improve farm profitability. Dairy farms were the most likely to agree that reducing emissions would improve profitability, while less favoured area (LFA) grazing livestock farms were least convinced.

4.16 Of those that strongly agreed reducing GHGs increases profitability, 14% still did not take any action to reduce their emissions. However, 29% of those who strongly disagreed that reducing GHGs would increase profitability still took action to reduce their emissions.

What farmers say they do to reduce greenhouse gas emissions

Figure 3.3 Actions being taken by farmers to reduce greenhouse gas emissions



Source: Farm Practices Survey

4.17 The 2023 results indicated that 53% of farmers were taking actions to reduce emissions. Larger farms were more likely to be taking action than smaller farms. Less favourable areas and lowland grazing livestock farms were less likely to be taking action than other farm types (with 28% and 45% taking action respectively). Unsurprisingly, those who think that reducing emissions is important are more likely to undertake an action to reduce emissions. 83% of farmers who thought it was very important to consider GHGs when making farm business decisions took action, whereas only 18% who thought it not at all important took action.

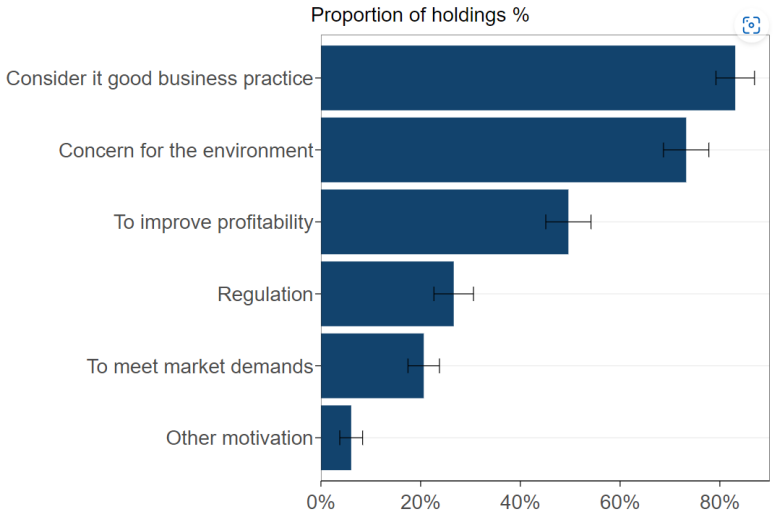
4.18 The most common actions to reduce GHG emissions were improving energy efficiency (82%), recycling waste materials on the farm (80%) and improving nitrogen fertiliser application accuracy (61%).

4.19 While most farm businesses should be able to implement key actions not all measures are suitable for all farm businesses. In general, larger farms were more likely to take action to reduce GHGs; however there were some key differences between farm types:

- Grazing livestock, dairy and mixed farm types had the highest uptake of clover in grassland.
- Cereals, other cropping and dairy farms are more likely to take actions to improve nitrogen fertiliser application compared to grazing livestock farms, but it is also recognised that not all enterprises (such as organic farms and some grazing livestock farms) apply nitrogen fertiliser.

What are the main motivations for undertaking the actions to reduce greenhouse gas emissions?

Figure 3.4 Main motivations for taking action to reduce GHG emissions



Source: [Farm Practices Survey 2023 –]

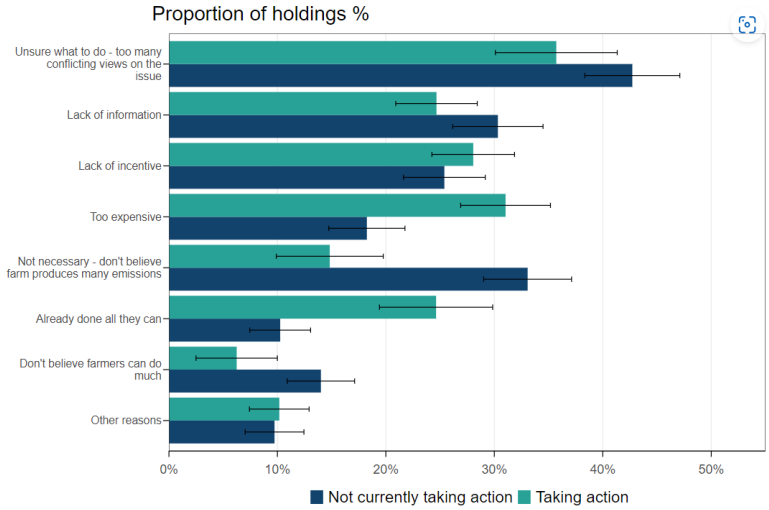
4.20 The main motivations for farmers to take action to reduce GHGs were that it was considered good business practice (83%) and concern for the environment (73%). This was fairly consistent across farm size and type.

4.21 Many farmers recognise the significance of GHG emissions, but some remain unconvinced about the business benefits of reducing emissions, with only 50% reporting that a main motivation was to improve profitability. There were

some differences between farm types, with just 30% of grazing livestock less favourable areas and 38% of grazing lowland famers motivated by profitability, compared to higher proportions for pigs and poultry (66%), dairy (65%) and mixed farms (60%).

What farmers say are the barriers to reducing emissions

Figure 3.5 Factors preventing action to reduce GHG emissions



Source: [Farm Practices Survey 2023 –]

4.22 While research suggests that most practices to reduce GHG emissions could save farmers money (and many farmers are likely to be influenced to change their practices because it makes good business sense), there are several key barriers to uptake that are non-financial, or not directly financial. These include a lack of willingness to undertake practices (e.g. limited trust in what is being asked and the outcomes that will result) and a lack of ability to undertake them (e.g. a lack of understanding, skills, time or capital).

4.23 For farmers not currently undertaking any actions to reduce GHG emissions:

- The most reported reason for not taking action was being unsure on what to do due to too many conflicting views (43%). These informational barriers are important as 30% responded that a lack of information was another key reason for not taking action.
- There is a wider issue around willingness to adopt mitigation practices, with 33% not believing it necessary due to the fact they believe they do not produce many emissions.
- Actual financial barriers are smaller in comparison, with 18% saying it was too expensive and 25% saying there was not enough incentive.

4.24 For farmers who were already taking actions to reduce GHG emissions:

- Financial barriers were a bigger issue, with 31% saying it was too expensive.
- Despite already taking steps to reduce GHGs, informational barriers still proved to be important, with a lack of information (25%) and uncertainty due to conflicting views (36%) preventing some further action.

5 IMPLICATIONS

5.1 Legal Implications

5.2 Financial Implications

5.3 Equality Implications

7 SCHEDULES

7.1 The Defra publication referenced and summarised is available at https://www.gov.uk/government/statistics/agri-climate-report2023/agri-climate-report-2023