Advancements in Agricultural Development
Volume 6, Issue 4, 2025
agdevresearch.org

Behavioural Drivers and Barriers for Adopting Climate Mitigation Actions on Dairy Farms

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Abstract

The adoption of climate mitigation actions on farms has the potential to lessen the effects of climate change on agriculture. The purpose of this study is to identify the behavioural drivers and barriers for adopting climate mitigation actions on dairy farms. This study employed a qualitative methodological approach consisting of 24 semi–structured interviews with dairy farmers in the republic of Ireland. This study provides insights into the drivers and barriers for the adoption of climate mitigation actions at farm level. An increase in workload, being sceptical of the benefits of mitigation actions, and increases in costs incurred were the three biggest barriers for adopting climate mitigation actions at farm level. An increase in revenue and farm productivity, wanting to benefit the environment, and advisory support were the three biggest drivers when adopting climate mitigation actions on farm. From the findings of this study, policy and Agricultural Knowledge and Innovation Systems (AKIS) recommendations are offered. A call for policies that subsidise the cost of mitigation actions for farmers and promote actions that reduce workload levels on farms are proposed. AKIS recommendations on how agricultural advisors can support farmers when implementing mitigation actions are also offered.

Article History

Received: February 13, 2025
Accepted: October 21, 2025
Published: November 15, 2025

Keywords

SDG 13: Climate Action; climate change; farmers; behaviour change

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Introduction and Problem Statement

Agriculture is one of the biggest contributors to GHG (Greenhouse Gas) emissions, accounting for 11% of global emissions (Statista, 2024). The European Parliament declared a European and global climate emergency in 2019 (Erbach, 2021). Maintaining a sustainable food security relies on a reduction in GHG emissions from agriculture at farm level (Hatfield et al., 2011). Accordingly, the purpose of this paper is to identify the behavioural drivers and barriers for the adoption of climate mitigation actions at farm level. Farmer adoption of climate mitigation actions is a critical step in reducing agriculture's significant contribution to GHG emissions.

In 2015, the United Nations adopted 17 Sustainable Development Goals (SDG) (Opoku, 2016). These SDGs reflect a global shift to socio–economic development which is underpinned by environmental sustainability, social inclusion, and economic development (Sachs et al., 2016). SDG 13 is closely linked to this research as it relates to Climate Action. If SDGs are not achieved, there will be devastating implications: increased poverty and hunger, degradation of water quality, human health and well–being, and global warming will accelerate. Therefore, understanding how best to support farmers in the uptake of mitigation actions at farm level will contribute to SDG 13 (Lal, 2020). The UN Paris Agreement set out ambitious climate targets for the European Union (EU) to achieve by 2030 and 2050. The 2030 goal is to reduce GHG emissions by 55% compared to 1990 levels (Teevan et al., 2021), while the EU is legally committed to achieving net–zero emissions by 2050 (World Economic Forum, 2021). Knowledge on farmer decision–making is essential to reduce GHG emissions arising from agriculture (Farstad et al., 2022). This study explores the implementation of actions from Ireland's Marginal Abatement Cost Curve (MACC) to identify drivers and barriers farmers experience when adopting these climate mitigation actions. Farmer engagement with discussion groups, having off–farm employment, age, education level, and size of family are all factors that influence farmer's willingness to adopt mitigation actions (Crudeli *et al.*, 2022; Wang *et al.*, 2022). Therefore, identifying the behavioural drivers and barriers influencing Irish farmers' adoption of climate mitigation actions can help support a reduction in agricultural GHG emissions and contribute towards achieving the EU's 2030 and 2050 climate goals.

Theoretical and Conceptual Framework

The COM–B model

Exploring farmers' decision–making process is complex (Farstad et al., 2022). Darnhofer (2020) highlighted farmers' decisions are not always based on science–informed actions and often they are made based on the farmer's goals and values. However, it is important to also consider the behavioural and contextual conditions of farmers' decision–making process (Brown et al., 2021). Cofré–Bravo et al. (2019) highlighted the importance of farmer networks, and how their social environment significantly influences decision–making. Therefore, a theoretical model, which considered all of these factors, was required to achieve the purpose of this study. Accordingly, this study utilised the Capability–Opportunity–Motivation Behavioural model (COM–B) (Michie et al., 2011) as the theoretical and analytical framework.

The COM–B model was developed from an extensive literature review of previously existing frameworks (Michie et al., 2011). The COM–B model proposes human behaviour is a result of the interactions between capability, opportunity and motivation within an individual (Michie et al., 2011). If an individual is lacking in any three of the components (capability, opportunity or motivation), they will not achieve the desired behaviour. If sufficient levels of capability, opportunity and motivation are reached, the desired behaviour can be achieved. *Capability* is defined by an individual's psychological and physical capacity to implement a behaviour, including having the necessary knowledge and skills (Michie et al., 2011). *Opportunity* is defined as all the factors that lie outside an individual or prompt the behaviour (Michie et al., 2011). *Motivation* is defined as all the brain processes that energise and direct behaviour. This includes habitual processes, emotional responding and analytical thinking (Michie et al., 2011). The COM–B model is used frequently in health care research (McDonagh et al., 2018; Murphy et al., 2023) and more recently has seen an increase in its use in agriculture (Burrell et al., 2024; Farrell et al., 2023). The use of the COM–B model in agriculture suggests farmers' decision–making process when opting to implement climate mitigation actions on their farm is influenced by a range of factors, both internal and external to the farmer. The COM–B model thus provides a theoretical lens to identify and classify the behavioural factors (i.e. drivers and barriers) influencing adoption of climate mitigation actions on farm.

Purpose

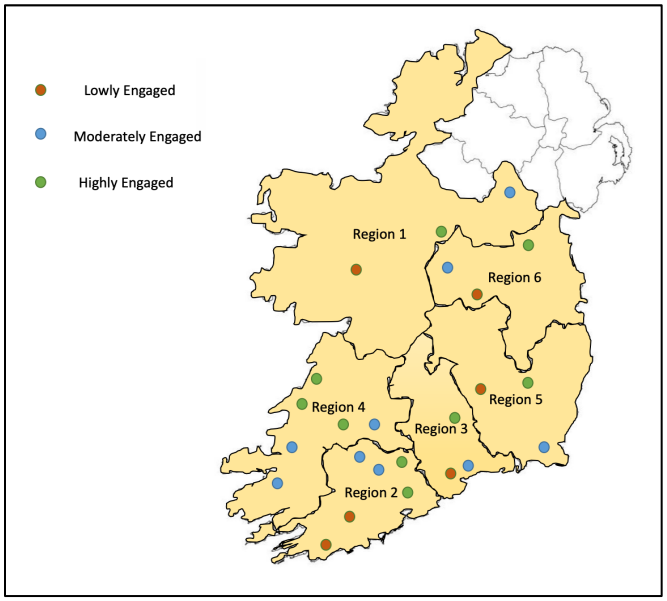
The purpose of this study was to identify the behavioural drivers and barriers for adopting climate mitigation actions on dairy farms using the COM–B model of behaviour change. This study used the COM–B model to shed light on the drivers and barriers influencing farmer adoption of climate mitigation actions at farm level.

Methods

A qualitative methodological approach was applied to this study to identify the behavioural drivers and barriers for adopting climate mitigation actions on dairy farms in Ireland. A qualitative research approach enables a researcher to develop new knowledge about human interaction, thoughts, experiences, behaviour and culture (Ohman, 2005). In–depth semi–structured interviews with farmers (n = 24) were conducted. Questions in the semi–structured interview guide were informed by the COM–B model and centred around farmer engagement/disengagement with climate mitigation actions on farm and the reason for this. The study population consisted of dairy farmers who avail of public advisory services in the Republic of Ireland. Figure 1 shows the location and engagement levels of each semi–structured interviewee. All interviews were conducted between October and December 2023. Each interview took place on farm, lasting 50 minutes on average. All interviews were audio–recorded and transcribed verbatim by the first author prior to analysis.

Figure 1

Region, Location and Engagement Level of Semi–Structured Interviews in Ireland.



Farmer selection for the semi–structured interviews was purposive. A criteria sheet was developed by the research team which ranked farmers into three categories; (a) lowly engaged (n = 6); (b) moderately engaged (n = 9); and (c) highly engaged (n = 9) with climate mitigation actions. The criteria sheet consisted of climate mitigation actions farmers could implement on their farm. The climate mitigation actions used in this study were derived from the Marginal Abatement Cost Curve (Lanigan et al., 2023). Advisors in each region were contacted by the first author to identify potential interviewees. Advisors completed the criteria sheets on behalf of the farmers as the information required was already known to them. Farmers were not aware of the criteria sheet or their engagement level. The advisor contacted farmers to seek permission to conduct the interview, once agreement was made, the first author made contact and a suitable time and date was arranged for the interview. If a farmer was engaged with five or less actions, they were deemed lowly engaged. If a farmer was engaged with less than 13 but more than five actions, they were deemed moderately engaged. Finally, if a farmer was engaged with 13 or more actions on the criteria sheet, they were deemed highly engaged. The research team created six regions across Ireland based on dairy farmer population to ensure similar spread of lowly, moderately, and highly engaged dairy farmers within each region. As the number of mitigation actions farmers are involved with influences their engagement with further mitigation actions (Tensi et al., 2022), this research methodology was applied to ensure drivers and barriers farmers experience come from a range of farmers, those who implement little to no actions and those who implement many actions. Although all semi–structured interviewees were male, an effort was made to include female farmers in this study. Female farmers were present in the sampling frame however, only one female was identified by advisors. This farmer declined to participate in an interview.

Table 1

Profile of Semi–Structured Interview Participants

Farmer	Gender	Region	Engagement Level
Farmer 1	Male	1	Moderate
Farmer 2	Male	6	Moderate
Farmer 3	Male	3	High
Farmer 4	Male	5	Low
Farmer 5	Male	2	Moderate
Farmer 6	Male	2	Moderate
Farmer 7	Male	1	High
Farmer 8	Male	1	Low
Farmer 9	Male	5	Moderate
Farmer 10	Male	4	Moderate
Farmer 11	Male	4	High
Farmer 12	Male	3	Moderate
Farmer 13	Male	6	High
Farmer 14	Male	6	Low
Farmer 15	Male	3	Low
Farmer 16	Male	4	Moderate
Farmer 17	Male	3	High
Farmer 18	Male	4	High
Farmer 19	Male	4	High
Farmer 20	Male	5	High
Farmer 21	Male	2	High
Farmer 22	Male	2	Low
Farmer 23	Male	4	Moderate
Farmer 24	Male	2	Low

Data Analysis

The data collected was analysed using thematic analysis through the software package NVivo (version 12.7.0 (3873)). An inductive and then deductive approach was applied based on the known constructs of the COM–B model. To achieve data familiarisation, the semi–structured interview transcripts were read repeatedly. Inductive coding was utilised primarily, and themes were formed organically. After coding, the transcripts were reread to ensure no data had been omitted. A deductive approach was then taken to categorise the themes based on the known constructs of the COM–B model. The frequency of which themes emerged in the data was used as an indicator of their level of influence as drivers or barriers in implementation levels. Throughout this study the authors engaged with reflexivity by continuously self–reflecting on their positions and influence in data collection and analysis. Data coding was done independently by the lead author and confirmed by verifying findings with the other authors. By providing detailed descriptions of interviewees (Table 1) the authors have allowed readers to assess the applicability of the findings of this study to different cohorts of farmers. Finally,

credibility was achieved by conducting interviews with farmers in an environment they are comfortable in and over a prolonged engagement which ensured a nuanced understanding of their experiences with drivers and barriers when implementing climate mitigation actions on farms. Clear record keeping of semi–structured interview transcripts, coding schemes and author notes were kept to ensure transparency of the findings.

Findings

In line with the COM–B model, the factors that influenced the adoption of climate mitigation actions varied across the sample. Table 2 provides a summary of the findings from this study. In the sections that follow, each influencing factor is discussed in detail.

Table 2

COM–B Model for Climate Mitigation Actions at Farm Level

Capability	Opportunity	Motivation
Psychological	***Physical***	***Automatic***
• Knowledge & Education (–)	• Agricultural Advisor (+,–) • Policy (+)	• Farmer Habit (+) • Wanting to benefit the environment (+)
Physical	***Social***	***Reflective***
	• Publicity (+) • Other farmers (+,–)	• Suits farm system (+,–) • Financial (+,–) • Workload (–) • Potential Success (–)

Note. Barriers (–) and drivers (+) that influence farmer adoption of climate mitigation actions.

Farmers' Capability to Implement Climate Mitigation Actions

Capability reflects a farmer's psychological and physical ability to implement climate mitigation actions. Psychological capability relates to having the knowledge and cognitive ability to implement climate mitigation actions e.g., farmer knowledge and education. Physical capability refers to the ability required to implement climate mitigation actions e.g., physical strength and stamina. In relation to the implementation of climate mitigation actions, capability relates to engaging in the necessary thought processes and reasoning around implementation (Michie et al., 2011). The psychological capacity of farmers shaped their behaviour towards implementing climate mitigation actions.

Farmer Knowledge and Education

Farmer knowledge on how to implement climate mitigation actions on their farm acted as a barrier for adopting climate mitigation actions at farm level. Lack of knowledge and awareness around how to implement climate mitigation actions and not being fully aware of the

advantages of implementation restricted adoption levels. This aligns with previous research conducted with Scottish farmers where those with higher education levels tended to adopt mitigation actions quicker as education is likely to promote knowledge around environmental issues (Barnes & Toma, 2012; Prokopy et al., 2008). While some farmers in this study are interested in implementing a particular climate mitigation action on their farm, their lack of knowledge about them is preventing action. They feel they would "need to know more about them before [they would] put them in".

The findings of this study suggest having knowledge about mitigation actions has a positive influence on implementation levels of the actions. This aligns with the findings of Dunphy et al. (2025) and those of Moerkerken et al. (2020) who found that knowledge of GHGs is a robust determinant for reducing GHG emissions on farm. All farmers interviewed as part of this study have an awareness of climate mitigation actions, but they do not necessarily know how to implement these mitigation actions. For example, all farmers interviewed were aware of grass measuring, but a lack of procedural knowledge acted as a barrier when opting to implement grass measuring on their farm. Grass measuring relates to the climate mitigation action of measuring how much grass is available for grazing on farm which helps to optimise grass quality and quantity (Creighton et al., 2011). These findings align with those of Regan et al. (2021) who identified the drivers and barriers affecting dairy farmer behaviour to engaged with grass measuring in Ireland. They identified lack of farmer knowledge as having an influence on farmer decision–making when choosing to implement grass measuring which mirrors the findings of this study with a similar study population and location. As grass measuring requires a high level of knowledge to implement this is likely a reason for non–adoption on farms.

Farmers' Opportunity to Implement Climate Mitigation Actions

Opportunity relates to factors external to a farmer (e.g., other farmers, advisors, and policies) that influences their decision–making when implementing climate mitigation actions on their farm. Policy measures, publicity, other farmers, and farm advisors were all factors that shaped farmers' individual behaviour, positively and negatively, when implementing climate mitigation actions.

Agricultural Advisor

The role agricultural advisors play, both positively and negatively, in this study is evident throughout. Agricultural advisors play an important role as they have a responsibility to communicate expert advice and new research findings to farmers in a way farmers can adopt (Carlock, 2007). Most farmers reported their agricultural advisor as having a positive influence on their decision to implement climate mitigation actions on their farm. In this study, agricultural advisors and the role they play in facilitating discussion groups helped encourage farmers to implement climate mitigation actions: "I started grass measuring in 1998… It was the influence of Teagasc [agricultural advisor organisation] that got me started, I could not function without it [grass measuring] now" (Farmer 18). The pivotal role discussion groups play in driving behaviour change is apparent with encouraging farmers to incorporate biodiversity into their farm management systems (Leader et al., 2024)

Within this study, it was evident agricultural advisors have an influential role, the third biggest, in farmers' decision to implement climate mitigation actions on their farm. Knowledge exchange and the supply of new knowledge is valued by farmers (Cofré–Bravo et al., 2019; Oreszczyn et al., 2010), and are essential for implementation of new practices because farmers rely on knowledge sources for farm innovation. This study also establishes knowledge exchange and the supply of new knowledge is valued by farmers (Moojen et al., 2024). However, agricultural advisors acted as both drivers and barriers for farmers when adopting climate mitigation actions in this study. For some farmers they acted as a barrier in relation to implementing climate mitigation actions on their farm: "I had my advisor out during the year and when I was asking her about it [sowing multi–species swards], she really did not convince me to go ahead with it, so I didn't." (Farmer 16)

Policy

Policy measures were found to influence farmers positively in relation to the uptake of mitigation actions on their farm. Although policy measures are forceful, for some farmers it meant that unless they were forced to change their farming habits, they would not: "Sometimes until you're forced to do certain things, you'll not do it." (Farmer 1)
Lane et al. (2018) found farmers view government regulations as a more critical issue than implementing climate actions affecting their decision–making process. Similar findings are seen in Liu et al. (2014) study that proved political ideology strongly influences farmers' knowledge of climate change which enhances the opportunity for implementation. Similar findings were found this study:

> I will try it, because if it comes to the stage where we need to do it I'd like to have a head start on it, it would be nice to have your foot dipped into the water before you're pushed in. (Farmer 1)

Publicity

In this study, publicity around climate mitigation actions acted as a driver for farmers to implement the a climate mitigation action. This was also seen in a study by Habib–Ur–Rahman et al. (2022) which illustrates how social media sites can be used to spread knowledge about climate change which encourages action in Asia. Some farmers in this study started using protected urea because it was a "buzz word." Farmers also feel it is important to gain good publicity for implementing climate mitigation actions on their farm. Farmers are conscious of how the public view the farming sector: "Look, for a farmer to be seen to be doing something even just for the public to see it, so even as simple as getting the public on side." (Farmer 11). This is also seen in Mills et al. (2017) study where farmers report they want to be seen "to be doing the right thing" and feel it is important to keep the public's view of agriculture positive.

Other Farmers

It is unsurprising other farmers e.g., neighbours, farmers in discussion groups etc., are sources of information for farmers given the academic literature that supports it (Garforth et al., 2003). Peer–to–peer learning involves a two–way (or more) exchange of knowledge between farmers through explaining, listening, discussing and working together with another farmer who might be more knowledgeable on the topic (Cooreman et al., 2018). Other farmers had both a

positive and negative influence in implementing climate mitigation actions on farms. In this study, interviewees report they start doing an action because another farmer is implementing the action or encourages them to implement the action: “If you see your neighbour doing something it would get you thinking like we’re putting in solar panels now and the farmer next door is now as well because we have.” (Farmer 10).

This is also seen in the findings from Farstad et al. (2022) where farmers have the confidence to implement mitigation measures as a result of positive learning experiences from their farming peers. Their findings also suggest farmers find their support for implementing climate mitigation actions in their local community with other farmers. The negative influence other farmers have on farmers decision–making process is largely related to farmers telling other farmers about negative experiences they had with implementing climate actions: “If I thought it would work of course I’d try it out but I just don’t think, from what I’ve seen from other farmer testimonials, I don’t think I’ll go ahead with it” (Farmer 10). In this study, other farmers mostly shaped farmer behaviour in a positive way i.e. increased adoption levels. The negative influence other farmers have on farmer behaviour can be seen as a leveraging factor but not as a barrier to behaviour.

Farmers’ Motivation to Implement Climate Mitigation Actions

Motivation is defined as the brain processes that direct and energise behaviour (Michie et al., 2011). Automatic motivation relates to emotions and impulses while reflective motivation relates to evaluating and planning. Throughout this study, there are a number of factors which impact farmers’ motivation to implement climate mitigation actions on their farm.

Farmer Habit

Farmers’ habits acted as a driver when adopting mitigation actions on their farm. In relation to spreading protected urea instead of a type of fertiliser that emits more GHG emissions, farmers tend to stick with their habitual ways and continue to do what they have always done on their farm. While Le Dang et al. (2014) highlighted farmer habit as a barrier to farmer adoption as a general constraint, the findings from this study offer a different perspective by showing that habitual practices are particularly evident in fertiliser use where they prove especially resistant to change."

However, for farmers who are in the habit of implementing climate mitigation actions on their farm, farmer habit has a positive effect on these farmers and reinforces the action. Some farmers have fenced off watercourses and stopped topping hedges as these were measures in an agri–environmental scheme in recent years and they got into the habit of implementing these mitigation actions. These farmers have continued to implement these actions since the scheme ended. There are similarities between the farmers in this study and those described by Mankad (2016) and Momenpour et al. (2024) where farmer habitual is a determining factor when adopting low–carbon agricultural technologies. Momenpour et al. (2024) explored farmers’ intentions to adopt low–carbon technologies in Iran. They concluded farmer habit had the second largest influence on farmer behaviour to adopt to climate change. This echoes the

findings presented in this study where other farmers milk record their herd annually, as "it's something that has always been done on the farm."

Wanting to benefit the environment

Farmers in this study reported they implement climate mitigation actions on their farm for the environmental benefits the action brings about. This was identified as the second biggest driver influencing the implementation of climate mitigation actions on their farm. This influence was especially evident when farmers speak about the hedgerows on their farm. There is a sense of pride amongst farmers, if they see other farmers doing something for environmental reasons they are proud of each other. Additionally, when farmers see the positive results of implementing a climate mitigation action, this encourages them to keep implementing the action each year on their farm. Some farmers reference how they "couldn't go back to cutting the hedges."

Suits Farm System

Farmers are influenced both positively and negatively to implement a mitigation action if it suits a farm system. For farmers who do not record milk production on their farm, they feel their current farm system works well and if they were to begin recording milk production, they would have to change what they do: "If I was milk recording, I'd feel like I'd have to be more ruthless when I am culling cows and then I'd have to buy in and I just don't see the justification… What I have is working so far" (Farmer 15).

Contrary to this, many farmers find implementing climate mitigation actions on their farm suits their farming system and this positively influences them to implement these actions each year. Farmers reported spreading slurry using Low Emission Slurry Spreading (LESS) techniques suited their farm systems because their contractor uses LESS techniques: "The main reason I use the low emission slurry spreader is because I can spread slurry in Spring and you can still graze it in a weeks' time" (Farmer 23).

Financial

Financial risks and incurring costs to the farmer act as a barrier for farmers in the uptake of climate mitigation actions. In this study, increasing farm expenses was the third biggest barrier for farmers when implementing climate mitigation actions on their farm. This is in line with other studies examining barriers for implementation of climate mitigation actions which found farmers consider saving money their priority when adopting these actions (Moerkerken et al., 2020; Roesch–McNally et al., 2018). In some cases, farmers had implemented climate mitigation actions on their farm and "stopped because of the cost." However, the extra revenue created from engaging in climate mitigation actions was the biggest driver when implementing climate mitigation actions on farm. This finding was also observed in Moerkerken et al. (2020) study which showed the positive relationship between implementing climate mitigation actions and 'cost saving' as a motivation for taking action. Farmers in this study who record milk production on their farm do so because they feel they can increase production and income. Similarly, when farmers are asked why they have reduced their fertiliser input their responses alluded to the financial gain made to their farming business: "Well the biggest reason

[they reduced fertiliser inputs] was price and the second reason was I just wanted to reduce my input that was basically it, it was down to cost" (Farmer 12).

Farmers in this study are not willing to spend money to reduce their GHG emissions. Farmers report "the big motivation is what you can save financially." This is unsurprising as Farstad et al. (2022) also found that although farmers acknowledged the value climate mitigation actions have for the environment, their focus is on the economic performance of their farm. Climate mitigation outcomes often come as a by–product or side effect of practices implemented to improve profitability (reduce cost) of farming operations (Farstad et al., 2022).

Workload

This study found if a climate mitigation action increases a farmer's workload, they are less likely to implement the action. Tasks that are time–consuming and laborious have a relatively low uptake on farm. Based on data frequency, a higher workload is the biggest barrier for farmers to implement climate mitigation actions on their farms. Similarities were found by Regan et al. (2021) as farmers perceived grass measuring as a time–expensive task. Farmers find recording milk production, grass measuring, incorporating multi–species swards, spreading protected urea, using sexed semen, and soil sampling all jobs that add to their workload: "I stopped milk recording and I never went back to it because it's another job and I'm here on my own and it's very slow in the morning and evening" (Farmer 14). These findings are similar to those of Mitter et al. (2019), who found climate change adopters cite workload on small–scale farms as a barrier to adoption. Farmers in the current study feel some climate mitigation actions are not always worth the time invested which compromises behaviour with these actions. These findings suggest adoption of mitigation actions that place considerable strain on time and resources will result in low implementation levels unless these barriers can be overcome.

Potential Success of Mitigation Actions

Being sceptical of the benefits of implementing climate mitigation actions on farm acted as the second biggest barrier to farmer adoption levels in this study. In relation to multi–species swards, farmers are sceptical of the persistence of the plant in swards:

> I don't do multi–species because there is no retention… The animals don't like it, it fades away after a few years and it's hard to manage. (Farmer 13)

These are rational reasons for not incorporating multi–species swards on farms (Vanclay & Lawrence, 1994). In relation to grass measuring, Regan et al. (2021) showed that all farmers are convinced of the benefits of grass measuring, but less than half of farmers were engaged with grass measuring on a regular basis. The findings presented in this study show some farmers do not see any benefits to engaging in this timely task: "I don't see the benefit of it [grass measuring], the cows will tell you if you haven't enough grass" (Farmer 15). A smaller percentage of farmers in this study are engaged with grass measuring on a regular basis highlighting the importance of perceiving grass measuring as beneficial.

Conclusions, Discussion, and Recommendations

The findings from this study shed light on the influencing factors for adopting climate mitigation actions on farm. An increase in workload, being sceptical of the benefits of mitigation actions, and increases in costs incurred were the three biggest barriers when adopting climate mitigation actions on farms. An increase in revenue and farm productivity, wanting to benefit the environment, and advisory support were the three biggest drivers when adopting climate mitigation actions on farms. Considering these findings, recommendations to the AKIS and policies can be made to enhance implementation levels of climate mitigation actions on farms. Policy makers should develop policies that subsidise the cost of mitigation actions whilst also promoting actions that reduce workload levels for farmers. Participation in previous agri–environmental schemes has led to the formation of habitual practices among farmers, resulting in the continued implementation of scheme–related actions even after financial incentives ceased. This suggests that such schemes can foster long–term behavioural change in the form of habit rather than financial motivation. Future policies should include a 'carrot' approach initially for farmers, which will hopefully result in sustained long–term change in the form of farmer habits.

The AKIS should take into consideration the findings from this study; in particular, the influence agricultural advisors have on farmer behaviour. In this study, agricultural advisors played both positive and negative roles in the uptake of mitigation actions on farms. Some advisors influenced farmer decision–making based on their own unconscious biases as opposed to providing farmers with the knowledge around actions and letting farmers make their own decisions. The AKIS should provide agricultural advisors with training to help advisors become aware of their own biases when giving farmers advice on mitigation actions. The AKIS should consider expanding its advisory services to further support advisors in its crucial role of encouraging farmers to implement climate mitigation actions on their farm. Agricultural advisors should also promote peer–to–peer learning opportunities for farmers to facilitate knowledge exchange to address scepticism of mitigation actions experienced by farmers. Peer–to–peer learning environments could be created through discussion groups, which have proved to be a successful educational space for farmers (O'Connor et al., 2021). Additionally, the AKIS should promote the use of advisory support tools that have been proven successful in raising farmer knowledge on mitigation actions available to them such as those of Dunphy et al. (2025) have developed. These changes to policy have the potential to increase adoption of climate mitigation actions on farm, which will result in a reduction of GHG emissions arising from agriculture and contribute to achieving SDGs, specifically SDG 13 (Climate Action).

Several key areas warrant further research to verify and advance our understanding of the drivers and barriers influencing the uptake of climate mitigation actions on farms. Future research should consider the influence of farmer demographics in decision–making processes to further enhance the findings presented within this paper. This study focused on exploring factors that influence dairy farmer adoption of mitigation actions on farms. Extending the study to a larger subset of farmers associated with different enterprises (e.g., tillage, drystock, etc.)

would be useful to determine if similar drivers and barriers are experienced across enterprises. Furthermore, all farmers interviewed in this study were male. The population of female farmers in Ireland is low (13.4%) (CSO, 2020). Hence, it was difficult to recruit female farmers to participate in this study. Valuable future research should focus on drivers and barriers female farmers experience when implementing climate mitigation actions on their farms. Other drivers and barriers are likely to be uncovered if the circle of inquiry is expanded. Future research could also explore and compare typologies of farmer engagement. This may offer an enriched and further nuanced understanding of farmer behaviour towards climate mitigation actions and reveal additional valuable insights into farmer behaviour. The findings from this study fill a gap that was missing in the literature: information of the drivers and barriers dairy farmers in Ireland experience when implementing climate mitigation actions on their farms. Although this area requires further research, the findings of this study can be a foundational baseline of knowledge on this cohort and inform future research.

Acknowledgments

Funding Information: This work was supported by the Teagasc Walsh Scholarship Programme [grant number 2021309].

Conflict of interest: There are no identified conflicts of interest among the authors.

Previous Dissemination: This paper was presented at the Agricultural Economics Society of Ireland Early Career Day Meeting in January 2025. https://aesi.ie/2025/01/31/early–career–day–meeting–recap/

Artificial Intelligence: Artificial intelligence tools were not used in any stage of the study or the manuscript's preparation.

Author Contribution Statement: **N. Dunphy** – formal analysis, transcription, data coding, investigation, writing–original draft. **S. Kearney** – confirming data coding, writing–review and editing. **S. Flannery** –confirming data coding, writing–review and editing.

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