

Extended Abstract

Please do not add your name or affiliation

Paper/Poster Title	Who will plant trees? An Application of the Extended Theory of Planned Behaviour to Irish farms
---------------------------	--

Abstract prepared for presentation at the 98th Annual Conference of The Agricultural Economics Society will be held at The University of Edinburgh, UK, 18th - 20th March 2024.

Abstract	200 words max
<p>Drawing on data from the Teagasc National Farm Survey (NFS), this study investigates factors determining farmers' intention to adopt small-scale planting measures that have been introduced recently as a part of CAP (Pillar I) Eco-scheme and (Pillar II) Agri-environmental-scheme in Ireland. A supplementary NFS survey provides new data on socio-psychological factors including farmers' economic concerns, environmental values, perceptions of barriers, and social norms. Farmers' intention to adopt three distinct planting options were investigated using the extended Theory of Planned Behaviour (TPB); general afforestation, planting 3-native-trees-per-hectare (eco-scheme), and planting trees under a new-Agri-environmental-scheme. Results highlight the positive 'attitude associated with environment improvement' as the strongest predictor of intention to adopt planting under the eco-scheme. Findings also reveal that farmers who foresee increased income through tree planting are more willing to engage in afforestation, particularly under the new-Agri-environmental scheme. While farmers generally hold positive views regarding the environmental value of tree planting (planting trees of any kind), it's crucial to note that the environmental attitudes may not resulted into intention to participate in the new-Agri-environmental-scheme. Consequently, the study suggests adoption can be promoted by providing farmers with diverse planting options, coupled with on-farm and participatory training/extension programmes that address both economic concerns and environmental values.</p>	
Keywords	Tree planting, Farmers' decision making, The extended theory of planned behaviour, Agri-environmental scheme, Eco-scheme
JEL Code	Agriculture: Agricultural Policy Q18, Agriculture and Environment Q15 see: www.aeaweb.org/jel/guide/jel.php?class=Q)
Introduction	100 – 250 words
<p>Ireland, as an EU member, has been set binding targets to reduced national GHG emissions, a task intricately linked to the agricultural sector (Tzemi and Breen, 2018, 2019; Duffy et al., 2020; Lanigan et al., 2018). Agriculture stands as the primary contributor, accounting for 38.4% of Ireland's national greenhouse gas (GHG) emissions (EPA, 2023), in which afforestation is recognised as a cost effective land based mitigation technology (Duffy et al., 2020; Lanigan et al., 2018).</p>	

In more recent times, state-funded private afforestation has targeted farmers planting through establishment grants and premia payments (DAFM, 2022). However, despite significant investment and growth in afforestation, Ireland still maintains the second-lowest forest cover in the EU today (Kilcline et al., 2021).

Engaging Irish farmers to transform from farming to planting trees has been considered as a major challenge and knowledge gap. This study address this gap by employing behavioural modelling to identify distinct cohorts of farmers'. This research seeks to uncover the factors that set these groups apart, acknowledging the pivotal role of individual farmer behaviour, as emphasised by TPB (Ajzen & Madden, 1986). The results have the capacity to empower policymakers in customising interventions to align with individual farmer behaviours. This, in turn, informs the delivery of more relevant and targeted schemes specifically designed for Irish farmers, thereby improving the effectiveness of afforestation initiatives within the broader context of sustainable agriculture.

Methodology

100 – 250 words

Survey Instrument: The 2022 National Farm Survey (NFS) is augmented by incorporating socio-psychological factors, encompassing farmers' economic concerns, environmental values, perceptions of barriers, and social norms. A set of 12 close-ended statements, rated on a five-point Likert scale, has been designed to explain farmers' intentions regarding afforestation.

Reliability and Validity Assurance: Potential variables were identified from literature and their relevance evaluated in workshops involving experts and researchers. To approve the content validity, the survey statements were established through the application of Ajzen's (2006) standard framework. Face validity and reliability were assessed through a pilot study involving 30 farmers. For the reliability analysis, Cronbach's alpha, yielded a value of 0.79 for farmers' intentions towards afforestation, surpassing the acceptable threshold (>0.7).

Reweighting for National Representation: The analysis focused on 563 out of 657 farms, and to ensure a nationally representative sample, the study employed weighting based on all available NFS dataset farm codes. Although the evaluation encompasses 563 farms, it is reflective of the broader landscape of 85,806 farms by reweighting method.

Analyse method: An Ordinal Logistic Regression (OLR) model was employed to examine the relationship between the hypothesised psychological factors and additional variables in predicting the probability of a farmer indicating a positive intention to afforest.

The approach integrates socio-psychological factors, including farmers' economic concerns, environmental values, perceptions of barriers, and social norms. Through this lens, the study aims to explore the factors distinguishing heterogeneous groups of farmers, categorised as willing, neutral, or unwilling to adopt afforestation in small-scale schemes on their farms.

Results	100 – 250 words
<p>The study reveals that the extended TPB model surpasses farmers' background factors in explaining behavioural intention related to tree planting. Despite a general reluctance among farmers, varying levels of intention are observed across different planting initiatives. Specific factors like attitude, subjective norms, and PBC exert distinct influences on various planting options, emphasising the significant role of 'economic attitude' in predicting planting intentions under the ACRES (Agri-environmental-scheme).</p> <p>Positive attitude toward economic and environmental outcomes align with favourable intention for ACRES and Eco-scheme tree planting, while negative attitude toward the 'permanency of tree planting' poses an obstacle to adoption, consistent with previous research (McDonagh et al., 2010; Duesberg et al., 2014, 2013; Ryan & O'Donghue, 2016). Younger farmers show more willingness to plant trees, in contrast to less engagement from those with higher stocking rates. Economic viability positively influences intentions for both eco-scheme and ACRES planting. Labour efficiency and non-land-investments emerge as pivotal factors influencing farmers' intention in planting schemes.</p> <p>When exploring farmers' intention towards afforestation schemes, it's noteworthy that 43.3% and 29.9% of farmers indicate a limited intention to participate in afforestation under the ACRES and eco-scheme programmes, respectively. While previous studies (Clement et al., 2009; Kaine et al., 2023) have pointed out an intention-to-action gap, a more pronounced gap between intention and action is observed among farmers expressing a willingness to engage in the eco-scheme. This difference may be influenced by the perceived ease of meeting environmental conditionality requirements, particularly regarding 'space for nature' practices.</p> <p>In conclusion, the study emphasises the importance of providing farmers with diverse planting options and implementing on-farm participatory initiatives and training/extension programmes to boost adoption rates.</p>	
Discussion and Conclusion	100 – 250 words
<p>This research unveils varied afforestation preferences among Irish farmers, suggesting a need for targeted promotion of specific schemes based on these differences. Recognising the substantial influence of farmers' economic attitudes on behavioural intentions, it is imperative to implement tree planting strategies that adequately compensate farmers for foregone earnings associated with ceased farming practices. This includes introducing income diversification initiatives and educational programmes emphasising the lasting economic and environmental benefits of afforestation. Essential to success is the targeted focus on cattle and sheep farms, who face lower opportunity costs. Farmers, particularly in dairy and tillage sectors, are less likely to adopt agri-environmental schemes like ACRES, contrasting with simpler alternatives such as the eco-scheme initiatives under Pillar 1 of the CAP.</p>	



Despite barriers, studies (Ryan & O'Donoghue, 2016) indicate that dairy farmers on poor soil are more likely to engage in tree planting, suggesting a specific target for policymakers. Recognising the influence of Subjective Norms, cultural initiatives fostering social support for afforestation are recommended, along with encouraging farmer participation in non-governmental organisations and local entities which support tree planting and forest management such as forest owner groups.

Emphasising the role of Perceived Behavioural Control in shaping afforestation intentions, policymakers are recommended to implement training programmes highlighting positive consequences of tree planting. Educational support post-planting, including tree and forest management, and support for participation in advisory programmes are crucial components. Future research should delve into actual behavioural intentions using mathematical programming to predict acceptance rates and assess economic and environmental impacts. This anticipates the potential influence of current socio-psychological policies on future trends in both Ireland and the EU.