Extended Abstract
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Paper Title	Sustainable Finance Design and Valuation of Ecosystem Services: An Expert Stakeholder Analysis

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***
Finding a balance between the ecosystem services provided by agriculture and those provided by forestry has been a challenge for stakeholders and policymakers across Europe and particularly in Ireland which has the second lowest level of forest cover of any European Union nation. While afforestation supports several ecosystem services and offers myriad environmental benefits, existing market structures have failed to properly value forestry when compared with competing land uses. In addition, past government policies to stimulate afforestation in Ireland have met with limited success, particularly among dairy farmers, (Ryan et al., 2022) as well as sociocultural opposition (Carroll et al., 2011). To overcome these hurdles, novel financial instruments are needed to properly value forestry ecosystem services and the opportunity cost of changing land use. There is also evidence that native afforestation can be more socioculturally palatable than the existing forestry model which relies heavily on non-native tree species. Given that the existing financial economics literature is limited in the area of land use change for environmental protection, a new approach is required which engages with stakeholders and leverages their expert knowledge in order to develop financial mechanisms to promote native afforestation which go beyond the existing government forestry subsidy programs.	

Keywords	Ecosystem services, stakeholder engagement, land use
JEL Code	Q15 land use, Q23 forestry, Q57 ecosystem services

Introduction	***100 – 250 words***
The values of forestry ecosystem services have been researched extensively across Western Europe and indeed globally (Acharya et al., 2019). Forests provide value through regulating services which provide benefits such as carbon sequestration and climate regulation, provisioning services (i.e timber production), supporting services which benefit biodiversity and habitats, and cultural services such as recreation (Acharya et al., 2019; Mori et al., 2017; Ryan et al., 2022; Thorsen, 1999; Strange et al., 2019). While the values of forestry ecosystem services are widely recognised in the scientific, government, and environmental communities, achieving afforestation has been a challenge. Ireland in particular has struggled to achieve afforestation goals and continues to have a very low level of woodland area (only 11.6-14.1 percent of total land area) making Ireland second only to Malta in being the least forested country in the European Union (DAFM, 2022; Eurostat, 2018). While the Irish case is extreme, Ireland is not alone among European nations in failing to meet	

afforestation policy goals. (Ryan et al., 2022). Research in this area has identified several barriers to afforestation such as sociocultural opposition and competition with traditional agricultural land uses which offer their own wide range of ecological and economic benefits (Carroll et al., 2011; Ryan et al., 2022; Song et al., 2020) as well as uncertainty, irreversibility, and information asymmetry between farmers and foresters.

Methodology	***100 – 250 words***

This study adapts the deliberative research approach of Shipley et al. (2020) and the scenario analysis method of Ehlers et al. (2022) to the problem of afforestation financing. Given the dearth of existing research in the realm of private sector afforestation mechanisms, this study employs a multi-stage Delphi method survey of expert stakeholders in the fields of agriculture, finance, forestry, and academia. Following the anonymous survey, respondents were invited to participate in an in-person scenario analysis workshop using live dialogue between expert panellists to identify feasible and effective private sector financial strategies to stimulate native afforestation on land currently used for dairy pasture.

Results	***100 – 250 words***

The survey responses from the expert panel support the environmental and social benefits of afforestation. Respondents also indicated that afforestation is a long-term and challenging process which may be supported by policies such as longer-term financial benefits, increased forestry education for farmers, and the incorporation of forestry benefits into farm succession plans. Expert discussion participants highlighted that the nonmonetary issues of sociocultural pressure and land use tradition as well as policy risk outweigh prospective financial benefits of forestry for most landowners. Discussants hoped that a future private sector afforestation mechanism would build trust with landowners by providing a longer-term income stream to support afforestation while lowering the administrative costs which burden current public sector afforestation programmes.

Discussion and Conclusion	***100 – 250 words***

This study finds that land-use stakeholders recognise the local and national environmental benefits of native afforestation while also understanding the economic and financial challenges which currently hamper native forestry growth. The expert stakeholders empanelled for this study highlighted the need for novel private sector financial supports to make the land-use transition to native forestry financially feasible and economically attractive to landowners. The results of this study support the conclusion that native afforestation can be achieved when supported by a financial instrument which considers the long-term and multigenerational impacts of native afforestation and is accompanied by effective farmer outreach and education.