Extended Abstract
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Paper/Poster Title	Paper: **Understanding Silvopastoral agroforestry using the Technology Acceptance Model: An application to farmers in Caquetá, Colombia.**

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Abstract	***200 words max***

Current land use systems in the Amazon largely consist of extensive conventional livestock operations that drive deforestation, degrade soil ecosystems, and tend to be socio-economically unsustainable. Silvopastural systems (SPS) have been promoted for a number of decades as an alternative but widespread uptake has yet to be seen. We explore the main drivers and barriers to uptake through a bespoke survey of 172 farms in the Caquetá region of the Colombian Amazon split equally between adoption and non-adoption.

We employ the Technology Acceptance model to understand uptake of SPS Results show that perceived ease of use and perceived usability are strongly determined by contextual factors. Years of experience in farming, as well as infrastructure issues around poor road access were negatively related to adoption, while perception of SPS benefits, proximity to other SPS farms, training in SPS, and understanding of SPS were positively related to adoption with statistical significance. The most promising intervention strategies involve addressing knowledge gaps via training and specialised extension and improving market access by removing regulatory barriers and strengthening demand for agroforestry products.

Keywords	Colombia; Silvopastoral Systems; Theory of Technology Acceptance
JEL Code	Q24, Q23, D22

Introduction	***100 – 250 words***

Deforestation and agricultural expansion endanger the functioning of the Amazon ecosystem and the livelihoods and wellbeing of the communities who live from this resource (Leite-Filho et al., 2021). A negative feedback cycle emerges from the coupling of poor physicochemical soil quality with unsustainable ranching that drives further degradation, eventually forcing farmers to abandon their unproductive land in search of native forest to colonise, thus restarting the degradation cycle (Barrett, Valentim and Ii, 2013; Rodriguez et al., 2021; Armenteras et al., 2017). After Brazil, the Colombian province of Caquetá has the highest deforestation rate in the Amazon basin (Olaya-Montes et al., 2021). Silvopastoral systems (SPS) have been found to offer an alternative to conventional ranching systems (Bermeo et al., 2022).

Generally, an SPS incorporates perennial trees and shrubs into pastures to mimic some of the ecosystem services provided by native forests while providing more consistent and higher quality forage to livestock (Aynekulu et al., 2020). SPS can also be less detriment to ecological health by supporting biodiversity, carbon sequestration, and water quality (Calle et al., 2013). From a socio-economic perspective farmers can also benefit from secondary forest products, such as lumber, food, medicines, and marketable fruits (Ollinaho and Kröger, 2021; Pardo Rozo et al., 2022).

Methodology	*100 – 250 words*

Working with the local department of agriculture, structured phone interviews were conducted with farmers across the study area with the aim of collecting an equal sample between adopters and non-adopters across the region. As a result, 172 farms were selected such that 86 (50%) had adopted silvopastoral systems on at least one hectare of land, and the other half had not.

We employ the theory of technology adoption (TAM) to understand the role of particular factors on the intention to adopt SPS. We include a range of factors, such as subjective norms and perceived behavioural control, to explain perceived ease of use and perceived usefulness. A structural equation model is used to determine the pathways for these effects.

Results	*100 – 250 words*

We find strong positive links between subjective norms and perceived usefulness (PU) (0.080), results demonstrabilty and PU (0.420). Self-efficacy had strong positive links to percieved ease of use (PE) (0.861) and perceived behavioural control to PE (0.282). Structural links between PE to PU were also positive ((0.803). However, PE to adoption intentions of SPS were weak and not significant, whereas PU to intention to adopt was significant (0.178)

Discussion and Conclusion	*100 – 250 words*

Colombia in the post-agreement landscape has experienced a range of growth demands but has strong commitments to green growth and, to meeting net zero targets. This should require reducing the intensity of conversion of natural forest to agricultural production. Key to this is supporting and convincing farmers to convert their more traditionally productive, but specialised, activities to engage with silvopastoral approaches. We explore the links between drivers using the TAM model and find strong links with the perceived usefulness of the approach, but not with the perceived ease of use. This infers that there are knowledge gaps in understanding the demonstrability of SPS, and support networks for assuring farmers that more nature based practices can integrated into specialised livestock systems,

Given the biophysical and socioeconomic context of Caquetá as a ranching-based tropical forest frontier, these results may be applicable in other regions undergoing the same transformations in land use. Since knowledge gaps were the most important barrier to adoption it is recommended that a strong focus be placed on policies and intervention strategies that address information asymmetries, such as specialised extension services and training programs with emphasis on gender equal access. However, there was evidence that, even with sufficient knowledge about SPS, farmers face additional barriers to adoption related to market access. Therefore, efforts must also be taken to bolster markets for agro-

forestry products and to address barriers to market access.