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"Reconcile land system changes
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Understanding adoption drivers of forest landscape restoration practices: evidence from northern Madagascar

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Abstract

Forest and Landscape Restoration (FLR), as a nature-based solution, aims to enhance tree cover while delivering ecological, social, and economic benefits. In line with the Bonn Challenge, Madagascar has pledged to restore 4 million hectares of land by 2030. However, the success of FLR hinges on the voluntary adoption of restoration practices by local communities—an area that remains insufficiently studied.

This study provides results on the drivers of adoption for three major FLR practice groups in northern Madagascar: Tree Planting-Based (TPB), Agroforestry (AF), and Sustainable Land Management (SLM), including Conservation Agriculture (CA) and Soil and Water Conservation (SWC). Based on a mixed-methods design, we combined survey data from 492 households across five localities with 20 Focus Group Discussions. A three-step analytical approach was used: descriptive statistics, a multivariate probit model, and Analytic Hierarchy Process (AHP).

Findings indicate that adoption is shaped by both shared and practice-specific factors. Knowledge of FLR practices, plot size, training access, and membership in farmer associations significantly increase the likelihood of adopting TPB and AF. Secure land ownership also plays a crucial role, emphasising the link between tenure security and long-term restoration investment. Biophysical constraints are more prominent; notably, a higher water availability index is associated with lower adoption of SWC, suggesting that these practices are more relevant in water-scarce areas. Furthermore, proximity to forest resources influences adoption of TPB and AF, pointing to important spatial dynamics in FLR implementation.

This study contributes by disaggregating adoption factors across FLR practice types, moving beyond aggregate-level analyses. The findings suggest that uniform restoration

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policies may overlook key contextual differences in adoption dynamics. Tailored, evidence-based interventions are therefore needed to align policy design with the socio-ecological realities of local communities. These insights offer a foundation for refining national FLR strategies and advancing comparative research on restoration adoption across landscapes.

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