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"Reconcile land system changes
with planetary health"

Understanding the patterns and drivers of adoption of land restoration practices: Evidence from seven African countries

Tesfaye Berhanu Woldeyohanes, Karl Hughes, Hilda Kegode, Sammy Carsan, Jasper Kleinsmann, Mieke Bourne

The Center for International Forestry Res. and World Agroforestry (CIFOR-ICRAF), Kenya

Abstract

Reversing or avoiding land degradation challenges is a major development goal to enhance land productivity in Africa. Towards this ambition, multi-country initiatives such as the African Forest Landscape Restoration Initiative (AFR100), under to the Bonn Challenge and the UN-Decade for Ecosystem Restoration, seek to urgently scale the adoption of restorative practices across the continent. Upscaling appropriate tree-based restoration practices, such Farmer Managed Natural Regeneration (FMNR) and enrichment planting, remains suboptimal. Using a unique household panel data from 7,214 smallholder farmers across seven African countries: Ethiopia, Ghana, Kenya, Mali, Niger, Rwanda, and Senegal, we: i) analyse the adoption patterns of four key land restoration practices: tree planting, tree planting with complementary care and management, FMNR, and the use of green manure; ii) assess factors contributing to the adoption of these practices with emphasis on the role of training and advisory services; and iii) examine the trade-offs and complementarities across eight restoration practices. We use the Regreening Action Index to measure the intensity of adoption, considering the multidimensional nature of land restoration efforts. To address methodological challenges, we employ several econometric models, including correlated random effects (CRE) probit and CRE recursive bivariate probit models with region fixed effects. We estimate multivariate probit model to analyses trade-offs and complementarities. Results consistently demonstrate that training and advisory support boost both the adoption rate and implementation intensity of land restoration practices. Additionally, participation in community-level restoration initiatives, availability of community-level tree nurseries, and membership in a farmer group positively affect adoption rates. Adoption is positively associated with economic factors such as off-farm work, remittances, and asset ownership, while female-headed households show significantly lower adoption rates. Multivariate probit model analysis indicates significant positive correlations (= 0.30 to 0.94) between different practices, suggesting a high degree of interdependence and complementarity. Overall findings imply gender-inclusive advisory services, provision of economic support, and enhancing community engagement are key ingredients for land restoration practices adoption. Further our results suggest the critical need to follow a more holistic approach when designing restoration actions that include context-level adaptive management flexibilities in often diverse agroecological and socio-economic contexts in sub-Saharan Africa

Keywords: Adoption, advisory support, econometric models, farmer managed natural regeneration, land restoration, regreening action index, training, tree planting

Contact Address: Tesfaye Berhanu Woldeyohanes, The Center for International Forestry Res. and World Agroforestry (CIFOR-ICRAF), Impact Assessment and Acceleration, c/o World Agroforestry (ICRAF), UN Avenue, Gigiri, 30677 Nairobi, Kenya, e-mail: t.woldeyohanes@cifor-icraf.org