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Assessment of push–pull technology adoption in Eastern Africa: Pathways, barriers, and enablers

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Abstract

Understanding the adoption pathways, dynamics, barriers, and facilitators of Push-Pull Technology (PPT) is vital for improving agricultural productivity and sustainability in Eastern Africa. PPT, an agroecological innovation, employs repellent and trap plants to manage cereal pests, enhance soil fertility, and combat major agricultural challenges, including parasitic *striga* weed, stem-borer infestations, and fall armyworm outbreaks. Despite its proven benefits, ranging from reducing mycotoxin contamination and improving soil fertility to providing livestock fodder and mitigating climate change effects, PPT adoption remains inconsistent across Eastern and Southern Africa. This study investigates the factors influencing the adoption and diffusion of PPT in Kenya and Uganda, with a focus on the technology's uptake, barriers to adoption, and factors enabling its expansion. A mixed-methods approach was employed, incorporating surveys, focus group discussions, and key informant interviews across diverse agroecological zones. Data collection targeted smallholder farmers, extension officers, and relevant stakeholders. Findings revealed that although PPT has significantly improved cereal production and enhanced ecosystem resilience, its knowledge and labor-intensive nature presents a barrier to widespread adoption. Key adoption drivers included farmer awareness, access to training, and perceived economic benefits, while challenges ranged from limited technical support to unfavourable climatic conditions. Gender dynamics, household income, and access to extension services also influenced adoption rates. This study provides insights into the adoption dynamics of PPT, highlighting the importance of targeted training, farmer support systems, and adaptive dissemination strategies. The findings offer practical recommendations for policymakers, extension officers, and development partners aiming to enhance PPT adoption, ultimately contributing to sustainable agriculture and improved livelihoods in the region.

Keywords: Adoption pathways, Africa , agroecological innovation, push-pull, smallholders, technology diffusion