Methodological Evaluation of Smallholder Farm Systems in Kenya: A Randomized Field Trial for Measuring Adoption Rates

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Abstract

Smallholder farming systems in Kenya are pivotal to food security and rural livelihoods. However, understanding their adoption rates of innovative practices remains a challenge. A randomized field trial was conducted across three districts in Kenya, involving 120 randomly selected smallholder farms. Each farm received one of four agricultural technology packages: improved seed varieties, drip irrigation systems, soil fertility management techniques, or a control group without any new technologies. The analysis revealed that the adoption rates varied significantly by district and technology type, with an average adoption rate of 52% across all treatments. Drip irrigation showed higher adoption (60%) compared to other interventions. This study provides insights into effective methods for measuring adoption rates among smallholder farmers in Kenya, contributing to the development of more targeted agricultural support policies. Future research should focus on assessing the long-term impacts and sustainability of these technologies on smallholder farms in Kenya. The empirical specification follows $Y = \vec{\beta_{0+\beta}} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Kenyan, Smallholder, Intervention Studies, Randomization, Impact Evaluation, Agricultural Innovations, Participatory Methods*

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