African Livestock Production (Science focus - Agri/Animal Science)

Methodological Evaluation of Smallholder Farms Systems in Kenya: A Randomized Field Trial for Risk Reduction Assessments

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Abstract

Smallholder farms in Kenya face significant challenges related to climate variability and market instability, necessitating effective risk reduction strategies. A randomized field trial design was employed, where 100 randomly selected farms were allocated into control and intervention groups. Data collection included pre- and post-intervention assessments of yield, market access, and financial health indicators using linear regression models for analysis. The study found that the implementation of climate-smart agricultural practices led to a statistically significant increase in maize yields by an average of 15% (95% confidence interval: +3% to +27%) compared to control farms, demonstrating the potential effectiveness of randomized field trials in measuring risk reduction. Randomized field trials proved effective for evaluating and implementing interventions that reduce risks faced by smallholder farmers in Kenya. These findings suggest a robust methodological approach for future agricultural research and policy development. Policy makers should consider the implementation of randomized field trials to evaluate new risk reduction strategies, while researchers should continue to refine these methods for broader application across different agroecological zones. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, Smallholder farming, Methodology, Risk assessment, Randomized trials, Sustainability, Precision agriculture*

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