



# Methodological Evaluation of Smallholder Farm Systems in Nigeria: A Randomized Field Trial for Risk Reduction Analysis

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## Abstract

Smallholder farmers in Nigeria face significant challenges related to agricultural productivity and risk management. Results indicated that incorporating drought-resistant crops into the farm system reduced yield variability by 20%, with a  $\pm 3\%$  confidence interval for this effect. The randomized field trial demonstrated the efficacy of structured interventions in mitigating agricultural risk, providing robust evidence for future policy and practice. Policy makers should consider implementing similar trials to identify effective risk reduction strategies for smallholder farmers. The empirical specification follows  $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *African agriculture, smallholder farming, agroecology, randomized trials, yield variability, risk assessment, sustainable intensification*

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