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Methodological Assessment of Quasi-Experimental Design in Measuring Yield Improvement Among Smallholder Farms Systems in Nigeria

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Abstract

Smallholder farming systems in Nigeria face challenges in achieving sustainable yield improvements despite efforts to enhance productivity. A mixed-methods approach was employed, including quantitative data analysis using regression models and qualitative interviews to explore farmer perceptions and practices. The study utilised propensity score matching (PSM) as the quasi-experimental design method. Regression analysis revealed that the adoption of improved agricultural technologies had a significant positive impact on yield improvement ($\beta = 0.45$, $p < 0.01$), with an estimated 20% increase in yields among participating farms. The quasi-experimental design successfully addressed issues of selection bias and non-random assignment, providing robust evidence for the effectiveness of certain agricultural interventions on yield improvement. Further research should focus on replicating these findings across different regions and integrating results into policy frameworks to enhance smallholder farmer livelihoods. quasi-experimental design, yield improvement, smallholder farms, Nigeria Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, Smallholder, Quasi-experimental, Evaluation, Methodology, Agricultural, Development, Impact*

ABSTRACT-ONLY PUBLICATION

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