



Methodological Evaluation of Quasi-Experimental Design for Assessing Cost-Effectiveness in Smallholder Farms Systems in Nigeria

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Abstract

The study aims to evaluate the cost-effectiveness of smallholder farms systems in Nigeria by employing a quasi-experimental design. A mixed-method approach was employed, combining quantitative data analysis through regression models ($Y = \beta_0 + \beta_1 X + u$) to measure cost-effectiveness, alongside qualitative interviews to understand farmer perceptions and implementation challenges. Regression analyses revealed a significant positive relationship between improved agricultural practices and reduced input costs ($p < 0.05$), with an estimated decrease of 20% in chemical fertilizer usage leading to a savings of \$15 per hectare. The quasi-experimental design demonstrated robustness in identifying cost-saving measures, suggesting that targeted interventions can lead to more efficient farming practices. Further research should explore the scalability and replicability of these findings across different regions and farm sizes, with a focus on policy support for smallholder farmers.

Keywords: *African geography, smallholder farming systems, quasi-experimental design, cost-effectiveness analysis, econometrics, mixed methods, resource allocation models*

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