



# Methodological Evaluation of Smallholder Farm Systems in Nigeria employing Quasi-Experimental Design for Clinical Outcomes Measurement

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## Abstract

Smallholder farming systems in Nigeria face challenges related to productivity and sustainability. A randomized controlled trial (RCT) was conducted with 150 smallholder farms, employing a pre-post intervention design. Data on input usage, output yields, and socioeconomic indicators were collected and analysed using linear regression models to estimate treatment effects. Farmers who adopted recommended agricultural practices showed an average yield increase of 20% in maize production compared to those who did not adopt these practices. The quasi-experimental design provided robust evidence on the effectiveness of intervention measures for enhancing smallholder farm productivity and sustainability. Future research should focus on replicating this study across different regions and crops, while also incorporating qualitative data to contextualize quantitative findings. The empirical specification follows  $Y = \beta_{0+\beta} X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *African agriculture, smallholder farming, randomized controlled trial, quasi-experimental design, precision agriculture, impact evaluation, yield assessment*

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