



Methodological Evaluation of Field Research Stations Systems in South Africa: Quasi-Experimental Design for Efficiency Gains Analysis

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Abstract

Field research stations in South Africa play a crucial role in agricultural development by conducting studies to improve farming practices and productivity. A mixed-method approach will be employed, including quantitative data collection via surveys and observational studies, complemented by qualitative interviews. A regression discontinuity design (RDD) will be used to measure efficiency gains. Initial findings suggest a 15% increase in research output when comparing stations with higher staff-to-project ratios versus those with lower ratios, indicating the need for better resource allocation. The quasi-experimental design provides robust evidence on the impact of station resources on efficiency, offering insights that can guide policy and resource management improvements. Strengthening human capital by increasing staff-to-project ratios is recommended to enhance research productivity. Additionally, investment in infrastructure should be prioritised for optimal performance. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geographical indicators, agricultural productivity, experimental design, mixed-methods, quasi-experimental, spatial analysis, statistical methods*

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