



Methodological Foundations for Evaluating Yield Improvement in Smallholder Farm Systems Using Difference-in-Differences Analysis in Rwanda: An African Perspective

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Abstract

This article focuses on developing a methodological framework for evaluating yield improvement in smallholder farm systems in Rwanda. The methodology will employ DID analysis, a quasi-experimental design that compares changes over time within control and treatment groups, to estimate the impact of agricultural interventions on smallholder yields. The framework will incorporate econometric techniques such as fixed effects models to account for potential confounding variables. The framework demonstrates the effectiveness and reliability of DID analysis as a method for evaluating yield improvement in smallholder farm systems, providing a robust methodology that can be applied across similar contexts. Recommendation is to incorporate this methodological approach into future research studies focused on evaluating agricultural interventions aimed at improving yields in smallholder farming systems. The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, African, Spatial, Statistical, Econometric, DID, modelling, Geographic*

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