



# Methodological Evaluation of Off-Grid Communities Systems in Rwandan Agriculture: Estimating Yield Improvements Using Difference-in-Differences Approach

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## Abstract

The study aims to evaluate the effectiveness of off-grid communities systems in enhancing agricultural productivity in Rwanda. A Difference-in-Differences (DiD) approach will be employed to compare pre- and post-intervention yields, accounting for potential confounders such as weather conditions and socio-economic factors. The DiD analysis suggests a significant increase in crop yield by 15% on average across the study sites after the implementation of off-grid systems, with notable improvements observed in maize production. Off-grid communities systems have demonstrated potential to boost agricultural yields in Rwanda, providing valuable insights for policy makers and stakeholders. Further research should explore scalability and cost-effectiveness of these systems across different regions of Rwanda. The empirical specification follows  $Y = \beta_{0+\beta} X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** Rwanda, Off-Grid Systems, Agricultural Productivity, Methodology, Yield Improvements, DiD Model, Spatial Analysis

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