# Methodological Foundations for Evaluating Smallholder Farm Systems through Difference-in-Differences in Senegal

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## Abstract

This study aims to evaluate the effectiveness of smallholder farm systems in Senegal through a methodological framework that employs difference-in-differences (DiD) analysis. A difference-in-differences approach will be utilised to compare pre- and post-intervention outcomes for smallholder farms in Senegal. This method involves constructing control groups using neighboring or similar non-participating farms as a baseline for evaluating intervention effects. This study provides robust evidence supporting the efficacy of DiD analysis for evaluating interventions targeting agricultural risk management within Senegalese smallholder farms. The findings suggest that further research should focus on replicating this methodology across different regions and policy contexts to ensure broader applicability. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *Sub-Saharan, African, Spatial, Econometrics, Randomization, DID, modelling, farm, systems*

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