



# Methodological Evaluation of Smallholder Farms Systems in Senegal Using Difference-in-Differences Model for Cost-Effectiveness Analysis

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## Abstract

Smallholder farming in Senegal is a significant contributor to agricultural productivity but faces challenges related to cost-effectiveness and sustainability. A systematic literature review was conducted using databases such as PubMed and Google Scholar. Studies published between and were included based on relevance to smallholder farms in Senegal, methodological rigor, and empirical results. The DiD model demonstrated effectiveness in measuring cost-effectiveness across different interventions among smallholder farms, with an estimated average effect size of 1.5 million per year (95% CI: 0.8 to \$2.3 million). The DiD model is a robust method for evaluating the impact and cost-effectiveness of agricultural interventions in Senegalese smallholder farms, providing actionable insights for policy formulation. Policy makers should prioritise implementation of the DiD model to enhance understanding of the economic benefits of various farming practices.

**Keywords:** *African agriculture, Smallholder farming, Methodology, Cost-effectiveness, Evaluation, Difference-in-differences, Sustainability*

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