African Development Geography
(Geography/Development/Social)

Methodological Evaluation of Smallholder Farms Systems in Ghana via Difference-in-Differences Model for Cost-Effectiveness Analysis

Kwesi Gyamfi Mensah[1], **Yaa Asantewaa Agyei**[2], **Dadie Kwasi Ababu**[3]

[1] University of Professional Studies, Accra (UPSA)

[2] Ashesi University

[3] Department of Interdisciplinary Studies, University of Professional Studies, Accra (UPSA)

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Correspondence: kmensah@hotmail.com

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Author notes

Kwesi Gyamfi Mensah is affiliated with University of Professional Studies, Accra (UPSA) and focuses on Environmental Science research in Africa.

Yaa Asantewaa Agyei is affiliated with Ashesi University and focuses on Environmental Science research in Africa.

Dadie Kwasi Ababu is affiliated with Department of Interdisciplinary Studies, University of Professional Studies, Accra (UPSA) and focuses on Environmental Science research in Africa.

Abstract

Smallholder farms in Ghana face significant challenges related to cost-effectiveness, particularly in the context of environmental sustainability and agricultural productivity. A key component of this study involves applying the DiD model, which will account for potential confounding variables such as market conditions and weather patterns. This approach aims to provide a robust assessment of farm system performance in Ghana. This study underscores the utility of the DiD model in evaluating the effectiveness of agricultural interventions aimed at improving smallholder farm efficiency in Ghana. The findings suggest that targeted investments in water management technologies can lead to substantial cost savings without compromising yields or environmental integrity. Based on the empirical evidence, policymakers and agricultural development practitioners are encouraged to prioritise initiatives focused on enhancing water resource management for smallholder farmers in Ghana. These efforts should be part of broader strategies aimed at achieving sustainable food security and environmental conservation. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, Smallholder, Sustainability, Econometrics, Randomization, Interventions, Efficiency*

ABSTRACT-ONLY PUBLICATION

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