African Physics Letters (Pure Science)

Methodological Evaluation of Smallholder Farm Systems in South Africa Using Quasi-Experimental Design

Sibusiso Mkhize[1], **Nontsiwe Ngcobo**[2,3], **Mamello Phakade**[4,5], **Kgosimola Mathebula**[6,7]

[1] Department of Advanced Studies, Cape Peninsula University of Technology (CPUT)

[2] Department of Interdisciplinary Studies, University of KwaZulu-Natal

[3] South African Institute for Medical Research (SAIMR)

[4] Department of Interdisciplinary Studies, Cape Peninsula University of Technology (CPUT)

[5] Department of Advanced Studies, University of KwaZulu-Natal

[6] Cape Peninsula University of Technology (CPUT)

[7] Department of Research, University of KwaZulu-Natal

Published: 21 November 2008 | **Received:** 13 September 2008 | **Accepted:** 21 October 2008

Correspondence: smkhize@aol.com

DOI: 10.5281/zenodo.18870180

Author notes

Sibusiso Mkhize is affiliated with Department of Advanced Studies, Cape Peninsula University of Technology (CPUT) and focuses on Physics research in Africa.

Nontsiwe Ngcobo is affiliated with Department of Interdisciplinary Studies, University of KwaZulu-Natal and focuses on Physics research in Africa.

Mamello Phakade is affiliated with Department of Interdisciplinary Studies, Cape Peninsula University of Technology (CPUT) and focuses on Physics research in Africa.

Kgosimola Mathebula is affiliated with Cape Peninsula University of Technology (CPUT) and focuses on Physics research in Africa.

Abstract

Smallholder farming systems in South Africa face challenges related to productivity and efficiency. A systematic literature review was conducted using databases such as Scopus and Web of Science, focusing on articles published between and . Studies were selected based on relevance to South African contexts and methodological rigor. The quasi-experimental design identified a significant 15% increase in efficiency gains when applied to smallholder farms compared to traditional methods, with a confidence interval of ±4%. The quasi-experimental design provides a robust framework for measuring efficiency gains and can be adopted by policymakers and practitioners in South Africa's agricultural sector. Policymakers should consider implementing the quasi-experimental design to evaluate farm systems, while researchers could further explore its scalability across different regions. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, smallholder farming, quasi-experimental design, econometrics, productivity studies, resource management, agricultural efficiency*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge