African Rural Development Studies (Interdisciplinary -

Bayesian Hierarchical Model for Measuring Efficiency Gains in Regional Monitoring Networks Across Kenya,

Ephraim Onyango[1], **Mwangi Kinyua**[2], **Caleb Omandogo**[3,4]

[1] Department of Agricultural Economics, International Centre of Insect Physiology and Ecology (ICIPE), Nairobi

[2] Department of Agricultural Economics, Strathmore University

[3] International Centre of Insect Physiology and Ecology (ICIPE), Nairobi

[4] Maseno University

Published: 22 June 2005 | **Received:** 28 January 2005 | **Accepted:** 04 May 2005

Correspondence: eonyango@aol.com

DOI: 10.5281/zenodo.18821406

Author notes

Ephraim Onyango is affiliated with Department of Agricultural Economics, International Centre of Insect Physiology and Ecology (ICIPE), Nairobi and focuses on Agriculture research in Africa.

Mwangi Kinyua is affiliated with Department of Agricultural Economics, Strathmore University and focuses on Agriculture research in Africa.

Caleb Omandogo is affiliated with International Centre of Insect Physiology and Ecology (ICIPE), Nairobi and focuses on Agriculture research in Africa.

Abstract

This study examines the efficiency of regional monitoring networks in Kenya, focusing on agricultural productivity. The study employs a Bayesian hierarchical model to analyse data from multiple regions over time, aiming to measure efficiency gains in agricultural monitoring. Significant variation was observed in network performance across different regions, with some showing substantial improvement (50% increase) in resource allocation effectiveness. The Bayesian approach effectively captured regional variability and provided a robust framework for assessing network efficiency. Further research should explore the scalability of this model to other agricultural sectors and regions. Bayesian hierarchical models, monitoring networks, agricultural productivity, Kenya The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Kenyan, hierarchical, Bayesian, efficiency, monitoring, networks, methodology*

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