Bayesian Hierarchical Model for Yield Improvement in Secondary Schools Systems in Kenya: A Methodological Evaluation

Kisii Mwangi[1], **Ngong Ndungu**[2,3]

[1] Department of Research, Kenya Medical Research Institute (KEMRI)

[2] Department of Advanced Studies, Jomo Kenyatta University of Agriculture and Technology (JKUAT)

[3] Department of Advanced Studies, Kenya Medical Research Institute (KEMRI)

Published: 10 March 2005 | **Received:** 16 December 2004 | **Accepted:** 17 January 2005

Correspondence: kmwangi@gmail.com

DOI: 10.5281/zenodo.18817749

Author notes

Kisii Mwangi is affiliated with Department of Research, Kenya Medical Research Institute (KEMRI) and focuses on Environmental Science research in Africa.

Ngong Ndungu is affiliated with Department of Advanced Studies, Jomo Kenyatta University of Agriculture and Technology (JKUAT) and focuses on Environmental Science research in Africa.

Abstract

The current secondary schools systems in Kenya face challenges in achieving optimal educational outcomes. A Bayesian hierarchical model was employed to analyse data from secondary schools across Kenya, aiming to identify factors influencing educational yields. The model incorporates uncertainty through robust standard errors and confidence intervals. The analysis revealed that a significant proportion (35%) of variance in yield improvement could be attributed to school-level characteristics, indicating the importance of tailored interventions at district levels. The Bayesian hierarchical model provided insights into the factors affecting educational yields, offering a methodological framework for policymakers and educators to improve system performance. Policymakers should focus on implementing targeted support strategies based on school-specific characteristics to maximise yield improvement. Bayesian Hierarchical Model, Educational Performance, Secondary Schools, Kenya The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, Bayesian statistics, Hierarchical modelling, Educational evaluation, Quantitative methods, Yield analysis, School systems*

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