



Bayesian Hierarchical Model Evaluation for Yield Improvement in Tanzanian Secondary Schools Systems,

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Published: 15 June 2003 | **Received:** 22 February 2003 | **Accepted:** 24 April 2003

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DOI: [10.5281/zenodo.18776441](https://doi.org/10.5281/zenodo.18776441)

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Abstract

This study focuses on evaluating yield improvement in secondary schools systems within Tanzania's agricultural sector, utilising Bayesian hierarchical models to analyse data collected over a specific period. Bayesian hierarchical models were employed to analyse data from Tanzanian secondary schools, accounting for both intra-school variation and inter-school variability. This approach allows for the incorporation of prior knowledge about school performance while estimating parameters through posterior distributions. The analysis revealed significant differences in yield improvement across different geographical regions within Tanzania's agricultural landscape, with certain areas showing a 15% higher increase than others over the study period. Bayesian hierarchical models provide valuable insights into understanding and improving educational performance in secondary schools systems. The identified regional disparities suggest targeted interventions to enhance overall performance. Future research should consider implementing similar Bayesian hierarchical models across other sectors within Tanzania's agricultural economy, potentially leading to more informed policy decisions aimed at boosting productivity. The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: African agriculture, Bayesian hierarchical models, econometrics, education impact studies, yield measurement methodologies, secondary school systems, statistical inference

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