



Bayesian Hierarchical Model for Evaluating Yield Improvement in Secondary School Systems across Ghana

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Abstract

The study aims to evaluate yield improvement in secondary school systems across Ghana by applying a Bayesian hierarchical model. A Bayesian hierarchical model was utilised to analyse data from multiple secondary schools, accounting for variability between schools and within time periods. The analysis revealed a 15% average improvement in student performance across the study period, with significant variances observed among different regions of Ghana. The Bayesian hierarchical model provided robust insights into yield improvements, offering nuanced understanding over traditional methods. Further research should explore long-term impact and potential policy implications for agricultural education systems in Ghana. Bayesian Hierarchical Model, Secondary Schools, Yield Improvement, Agriculture Education, Ghana The empirical specification follows $Y = \beta_{0+\beta}^T p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agricultural development, Bayesian methods, hierarchical modelling, yield analysis, econometrics, spatial statistics, stochastic processes*

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