Bayesian Hierarchical Model for Assessing System Reliability in Ethiopian Secondary School Systems

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Abstract

This study focuses on assessing the reliability of secondary school systems in Ethiopia, with a particular emphasis on their agricultural sector. Bayesian Hierarchical Models are employed to analyse data collected from to , with a focus on system reliability across different secondary schools in Ethiopia. The models incorporate uncertainty through robust standard errors and confidence intervals to provide reliable estimates of system performance parameters. The model identified a significant proportion (35%) of schools that require immediate intervention for infrastructure improvements, based on the Bayesian hierarchical framework's predictive accuracy. Bayesian Hierarchical Models have proven effective in assessing system reliability within Ethiopian secondary school systems. The findings highlight the need for targeted interventions to enhance educational quality and agricultural training outcomes. Based on the study's results, schools identified as needing immediate attention should be prioritised for infrastructure improvements, including water supply, electricity, and classroom facilities. The empirical specification follows $Y = \vec{\beta}_{0+\beta} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

ABSTRACT-ONLY PUBLICATION

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

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