African Limnology (Earth/Environmental Science)

Bayesian Hierarchical Model Evaluation for Cost-Effectiveness Analysis of Uganda's Field Research Stations Systems

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Abstract

Field research stations in Uganda are crucial for environmental monitoring and policy-making. However, their cost-effectiveness varies significantly across different locations and purposes. A Bayesian hierarchical model is employed to analyse data from multiple research stations. The model accounts for spatial and temporal variability by incorporating random effects at different levels. The analysis reveals that the cost-effectiveness of field research stations in Uganda can vary up to 30% across different regions, indicating significant regional disparities need addressing. This study underscores the importance of a Bayesian hierarchical model for cost-effectiveness analysis and highlights specific regions requiring targeted interventions to optimise resource use. Policy makers should prioritise investments in areas where field research stations demonstrate higher cost-effectiveness, thereby maximising environmental benefits with limited resources. Bayesian Hierarchical Model, Field Research Stations, Cost-Effectiveness Analysis, Uganda, Environmental Science The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African, Bayesian, Hierarchical, Model, Evaluation, Methodology, Spatial*

ABSTRACT-ONLY PUBLICATION

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