African Land Degradation Studies (Environmental/Earth Science)

Bayesian Hierarchical Model for Evaluating Secondary School Systems and Risk Reduction in Nigerian Educational Infrastructure: A Theoretical Framework

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Abstract

Nigeria's secondary school education system is under significant strain due to inadequate infrastructure and resources, leading to potential risks such as poor learning outcomes and educational quality. A Bayesian hierarchical model will be employed to analyse data on infrastructure quality and student performance across various regions of Nigeria. This approach accounts for variability at different levels (e.g., schools within districts) and incorporates prior knowledge to improve predictive accuracy. This study underscores the importance of comprehensive risk assessment and targeted interventions in improving Nigeria's educational infrastructure, contributing to more equitable learning environments. Based on the findings, we recommend prioritising investment in rural school facilities and implementing adaptive management strategies that incorporate community engagement for sustainable improvements. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, African, Bayesian, Modelling, Risk, Awareness, Hierarchical*

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