



Methodological Evaluation of Secondary Schools Systems in Tanzania: Multilevel Regression Analysis for System Reliability Assessment

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Abstract

The secondary education system in Tanzania is a critical component of agricultural development, influencing rural productivity and food security. A multilevel regression model will be employed to assess system reliability at both school-level and district-level, accounting for variability due to hierarchical structures. The multilevel regression analysis indicates that teacher-student ratio (direction: higher ratios associated with poorer performance) has a significant impact on student academic achievement in secondary schools. This study provides robust evidence supporting the need for targeted interventions aimed at improving teaching resources and quality to enhance educational reliability in Tanzania's secondary school systems. Educational policymakers should prioritise investment in teacher training, resource allocation, and infrastructure improvements to mitigate systemic weaknesses identified by this analysis. Secondary Education Systems, Multilevel Regression Analysis, System Reliability, Teacher-Student Ratio, Agricultural Development The empirical specification follows $Y = \beta_{0+\beta} \vec{p} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Tanzania, Sub-Saharan, Multilevel, Regression, Evaluation, Assessment, Analysis

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