Methodological Evaluation of Regional Monitoring Networks in Kenya: Multilevel Regression Analysis for System Reliability Assessment

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Abstract

Regional monitoring networks in Kenya are used to track agricultural pests and weeds, but their effectiveness varies across different regions. A multilevel regression analysis was conducted using data from multiple regions. The model accounts for both fixed effects (e.g., region-specific climate conditions) and random effects (e.g., variability within each region). The analysis revealed that the reliability of monitoring systems is influenced by factors such as funding levels and infrastructure quality, with significant differences observed across different regions. These findings suggest that improvements in funding and infrastructure are necessary to enhance system reliability for effective pest and weed management. Investment strategies should focus on enhancing regional monitoring networks through targeted support for under-resourced areas. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, 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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