



Bayesian Hierarchical Model for Yield Improvement in Smallholder Farms Systems of Kenya: A Methodological Framework

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Abstract

Smallholder farms in Kenya face challenges in yield improvement due to variability in climate conditions, soil fertility, and agricultural practices. The study will employ a Bayesian hierarchical linear mixed-effects model with random effects for farm-level heterogeneity and fixed effects for environmental factors. Uncertainty in parameter estimates will be assessed using posterior predictive checks. The proposed Bayesian hierarchical model offers a robust method for evaluating and enhancing smallholder farm yields in Kenya, contributing to sustainable agricultural development. Policy makers should support farmers with targeted interventions that align with identified best management practices. The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Kenyan, Smallholder, Bayesian, Hierarchical, Model, Ecosystem, Adaptation

ABSTRACT-ONLY PUBLICATION

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