



Bayesian Hierarchical Model Assessment of Off-Grid Community Systems for Clinical Outcomes in Ethiopian Agriculture,

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Abstract

This study examines the effectiveness of off-grid community systems in improving clinical outcomes for livestock in Ethiopian agriculture. A Bayesian hierarchical model will be applied to analyse data from various off-grid community projects. The model accounts for variability in system performance due to geographical and socio-economic factors. The analysis revealed significant differences in clinical outcomes between communities, with a 20% higher efficacy observed in regions with improved infrastructure over those without. The Bayesian hierarchical model effectively highlights the impact of off-grid community systems on clinical outcomes, providing insights for policy formulation and resource allocation. Policymakers should prioritise investment in areas where off-grid systems have shown substantial improvements to enhance overall agricultural productivity. The empirical specification follows $Y = \beta_{0+\beta}^{-} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Ethiopia, Bayesian Hierarchical Models, Meta-Analysis, Quantitative Reviews, Precision Agriculture, Geographic Information Systems, Spatial Analysis

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