



Methodological Evaluation of Smallholder Farm Systems in Ethiopia Using Multilevel Regression Analysis to Measure Risk Reduction

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Abstract

Smallholder farming systems in Ethiopia are characterized by high levels of variability across different regions and seasons. The study employed multilevel regression analysis to assess the impact of various factors at both individual and community levels on risk reduction outcomes. A significant proportion (45%) of farms showed improvement in their risk management strategies, attributed mainly to external support programmes. Multilevel regression analysis effectively identified key drivers of risk reduction among smallholder farmers, providing robust insights for policy formulation. Policy makers are advised to integrate multilevel regression models into future studies and implement targeted interventions based on the findings. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Ethiopia, Smallholder Farms, Multilevel Regression, Variability, Risk Management, Analytical Techniques, Agricultural Economics*

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