African Laser Physics (Pure Science)

Quasi-Experimental Design for Risk Reduction in Smallholder Farms Systems in Rwanda: A Methodological Evaluation

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Abstract

Smallholder farms in Rwanda face significant challenges related to risk management, affecting their productivity and sustainability. A mixed-method approach combining qualitative interviews with quantitative surveys was employed to assess the impact of implemented interventions on reducing agricultural risks. Farmers reported an average 20% decrease in crop loss due to effective insurance schemes and improved weather forecasting tools, indicating a substantial reduction in risk exposure. The quasi-experimental design proved effective in measuring the efficacy of risk mitigation strategies among smallholder farmers. Further research should explore scalability and cost-effectiveness of these interventions across different geographical regions and socio-economic contexts. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geographics, Smallholder farming systems, Quasi-experimental design, Risk assessment methodologies, Empirical evaluation, Quantitative research, Qualitative analysis*

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