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Methodological Evaluation of Regional Monitoring Networks in Ethiopia: A Field Trial on System Efficiency

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Abstract

Regional monitoring networks have been established in Ethiopia to enhance agricultural productivity through targeted interventions. The study employs statistical models to analyse network efficiency gains. A mixed-effects linear regression model is used to estimate system performance parameters with robust standard errors accounting for spatial correlations. A significant proportion (45%) of monitored farms showed increased yields post-intervention, indicating potential effectiveness but also highlighting the need for further optimization in certain regions. The randomized field trial demonstrates that methodological improvements are necessary to maximise network efficiency and yield positive outcomes across all regions. Enhanced data collection methods and targeted interventions should be implemented based on findings from this study. monitoring networks, agricultural productivity, mixed-effects linear regression, system efficiency The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Ethiopia, Monitoring Networks, Methodology, Efficiency Measurement, Statistical Analysis, Randomized Trials, Agricultural Productivity*

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