Quasi-Experimental Evaluation of Process-Control Systems in Senegalese Agricultural Yield Improvement

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Abstract

Agricultural yield improvement in Senegal has been a focus due to its significant economic importance and environmental sustainability. A mixed-methods approach combining surveys, interviews, and yield data collection was employed. Field trials were conducted in three distinct regions representing varying soil conditions and climate zones. Initial results suggest that process-control systems significantly improved yields by an average of 15% across tested crops (e.g., rice and maize) compared to conventional farming methods. The quasi-experimental design provided robust evidence for the effectiveness of process-control systems in enhancing agricultural productivity, particularly in challenging environmental conditions. Future research should expand the study to include a broader spectrum of crop types and regions to ensure generalizability. Agricultural yield improvement, Process-control systems, Senegal, Quasi-experimental design The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, Quantitative Methods, Qualitative Research, Process-Focused, Experimental Design, Agricultural Efficiency, Precision Farming*

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