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Methodological Assessment of Process-Control Systems in Ghana: Quasi-Experimental Evaluation of Yield Improvement

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Abstract

Ghana's agricultural sector is characterized by low yield due to inconsistent application of process-control systems. A mixed-method approach was employed, integrating surveys with yield data analysis. A regression discontinuity design (RDD) was used to estimate the impact of process-control system adoption on yield improvements. Initial results suggest a 10% increase in cotton yields and a 7% improvement in rice yields among farmers implementing process-control systems compared to those not using them, with robust standard errors indicating statistical significance at $p < 0.05$. Process-control systems significantly contribute to yield improvements in Ghana's agricultural sector, particularly for cotton and rice crops. Farmers should be encouraged to adopt process-control systems through targeted training programmes and incentives. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African agriculture, Geographic Information Systems (GIS), Methodology, Precision farming, Quasi-experiment, Survey methodology, Yield analysis*

ABSTRACT-ONLY PUBLICATION

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