



Evaluation of Power-Distribution Equipment Systems in Rwanda Using Quasi-Experimental Design for Yield Improvement Analysis

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Abstract

Power-distribution equipment systems (PDES) play a critical role in ensuring reliable electricity supply to rural areas of Rwanda. However, their effectiveness and impact on agricultural productivity have not been systematically evaluated. A quasi-experimental design was employed to assess the effect of PDES on crop yields. The study utilised data from randomly selected villages where PDES were installed and compared them with control areas without such installations. The analysis revealed a statistically significant increase in maize yield by 15% (95% CI: [4, 26]) in the villages equipped with PDES. This indicated that the power-distribution systems significantly improved agricultural productivity. The quasi-experimental design demonstrated robust results indicating that PDES can enhance crop yields in rural Rwanda. Further studies should be conducted to explore other crops and assess long-term sustainability of these installations. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Rwanda, Quasi-experimental design, Power-distribution equipment systems, Agricultural productivity, Methodology, Yield analysis, Africa

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