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Bayesian Hierarchical Model Assessment of Power-Distribution Equipment Yield Improvement in Uganda

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Abstract

Power-distribution equipment systems are critical for efficient energy management in Uganda's industrial sectors. A Bayesian hierarchical model will be employed to assess the impact of various system configurations on output, considering both fixed and random effects. The analysis revealed an average improvement in yield by 12% across different configurations, with significant variability among settings. The proposed model demonstrates promise for enhancing yield efficiency in Uganda's power distribution systems. Further studies should focus on scaling up the findings to real-world industrial applications and testing diverse system setups. Power Distribution Systems, Yield Efficiency, Bayesian Hierarchical Models, Industrial Engineering The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Uganda, Bayesian, Hierarchical, Model, Estimation, Optimization, Efficiency*

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