African Climate Change Science (Earth Science focus)

Challenges of Energy Theft and Grid Instability in Urban Uganda,

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Abstract

Energy theft and grid instability are significant issues in urban areas of Uganda, contributing to energy shortages and economic inefficiencies. Data from a survey conducted between and was analysed using regression analysis to identify correlations and causal relationships among variables such as population density, income levels, and reported incidences of theft. The study found that urban areas with higher populations experienced an average of 30% more grid losses compared to less populated regions. Theft rates were correlated with lower incomes and higher unemployment, indicating a socioeconomic dimension to these issues. Urban Ugandan cities face compounded challenges from both theft and grid instability, exacerbated by socio-economic disparities. Efforts should focus on improving access to affordable energy solutions for lower-income groups and enhancing public awareness campaigns against theft. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, urbanization, energy poverty, power theft, grid resilience, econometrics, case study*

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