African Nanotechnology Applications (Technology)

Methodological Evaluation of Power-Distribution Equipment Systems in Ghana

Yaw Danso[1,2], **Kofi Gyamfi**[3]

[1] Department of Mechanical Engineering, University of Professional Studies, Accra (UPSA)

[2] Department of Mechanical Engineering, Council for Scientific and Industrial Research (CSIR-Ghana)

[3] University of Professional Studies, Accra (UPSA)

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Correspondence: ydanso@hotmail.com

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Author notes

Yaw Danso is affiliated with Department of Mechanical Engineering, University of Professional Studies, Accra (UPSA) and focuses on Engineering research in Africa.

Kofi Gyamfi is affiliated with University of Professional Studies, Accra (UPSA) and focuses on Engineering research in Africa.

Abstract

Power distribution equipment systems (PDES) in Ghana play a crucial role in ensuring reliable electricity supply to urban and rural areas. However, their adoption rates vary significantly across different regions. A mixed-methods approach was employed, including surveys, focus groups, and performance data collection from randomly selected PDES installations across three regions of Ghana: Greater Accra (urban), Central Region (semi-urban), and Northern Region (rural). Randomization ensured a balanced sample distribution among the regions. The analysis revealed that adoption rates in Greater Accra were significantly higher than in the Northern Region, with an average adoption rate of 85% compared to 60%, respectively. This difference was attributed to better infrastructure and government support in urban areas. This study provides valuable insights into the factors affecting PDES adoption in Ghana and highlights the need for targeted interventions to improve service quality in underserved regions. Policy recommendations include increased investment in rural electrification programmes, community engagement initiatives, and standardised monitoring systems to enhance overall system performance and reliability. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, randomized, field, trial, infrastructure, electrification, econometric*

ABSTRACT-ONLY PUBLICATION

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