African Geomatic Engineering

Solar Home Systems and Their Impact on Lighting Quality and Education Access in Northern Ghana: A Study

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Abstract

Solar home systems (SHS) have been increasingly adopted in rural areas of northern Ghana to improve access to electricity and enhance household productivity. A mixed-methods approach combining quantitative data from surveys and qualitative insights through interviews was employed to assess the efficacy of SHS in rural settings. The findings indicate that households using SHS reported an average increase of 20% in lighting quality, leading to better study environments for children. There was also a discernible trend towards improved educational outcomes among students from families with SHS compared to those without. This research underscores the positive impact of solar home systems on both lighting conditions and education access in northern Ghana's rural areas. Given the significant benefits observed, continued support for the deployment of renewable energy solutions is recommended to address remaining disparities in electricity access. Solar Home Systems, Lighting Quality, Education Access, Northern Ghana The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, African, Solar, PovertyReduction, EnergyAccess, QuantitativeResearch, QualitativeAnalysis*

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