

Beyond Growth: The Role of Institutional Quality in Alleviating Energy Poverty in Sub-Saharan Africa

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Overview

As sub-Saharan Africa (SSA) continues to grapple with widespread energy poverty, the region's ability to achieve universal energy access by 2030 hinges on more than just economic growth—it requires strengthening institutional frameworks. Despite global progress in expanding energy access, achieving universal energy access by 2030 remains challenging (Bousnina & Gabsi, 2023). Recent crises, including the COVID-19 pandemic and geopolitical tensions, have reversed gains, with 760 million people lacking electricity in 2022—80% of whom reside in SSA (IEA, 2023). While economic growth in the region has been notable, essential energy services remain inaccessible to large segments of the population (Adom et al., 2021), highlighting the critical role of energy in fostering economic development (Gaye, 2007; Husnain et al., 2021).

This study investigates the role of institutional quality in shaping the relationship between economic growth and energy poverty in SSA. We hypothesise that economic growth alone is insufficient to alleviate energy poverty without strong institutional quality, and that there exists a threshold level of institutional quality, beyond which economic growth more effectively reduces energy poverty. Using panel data, we employ a Dynamic Panel Threshold model to identify this threshold and a System Generalized Method of Moments (SYS-GMM) estimator to explore the relationship.

Preliminary findings suggest that strong institutions are indispensable for translating economic growth into tangible improvements in energy access. High-quality institutions attract investments, enhance resource allocation, and enable effective policymaking, particularly in renewable energy, driving innovation and cost reductions (Shittu et al., 2024). Institutional quality thus determines the extent to which energy poverty is addressed (Nguyen & Su, 2022; Bousnina & Gabsi, 2023), aligning with the broader goals of Sustainable Development Goal 7. By introducing a sustainability-focused measure of energy poverty, this study also emphasises the importance of integrating environmental considerations into energy poverty studies. The potential of renewables, given their long-term affordability and adaptability, is pivotal for expanding access in resource-rich SSA, providing a pathway to sustainable and inclusive development (Adom et al., 2021).

Methods

This study investigates how institutional quality influences the relationship between economic growth and energy poverty in 43 SSA countries from 2002 to 2021. Using panel data from the World Bank's World Development Indicators and World Governance Indicators, the analysis employs Seo and Shin's (2016) Dynamic Panel Threshold model. This method estimates the threshold parameter (γ) using a bootstrap procedure to test its significance, then fits the model separately for countries with institutional quality above and below this threshold. After identifying the threshold, the study applies a SYS-GMM estimator to analyze the dynamic relationship, which is particularly well-suited for this context, given its ability to handle panel data with more countries than time periods, dynamic models, and endogeneity concerns (Roodman, 2009). The econometric model is as follows:

$$\ln(EP_{it}) = \alpha_0 + \alpha_1 \ln(EP_{it-1}) + \alpha_2 \ln(EG_{it}) + \alpha_3 INST_{it} + \alpha_4 (\ln(EG_{it}) \cdot I(INST_{it} \leq \gamma)) + \alpha_5 (\ln(EG_{it}) \cdot I(INST_{it} > \gamma)) + \alpha_6 X_{it} + \varepsilon_{it}$$

where EP_{it} represents energy poverty in country i at time t , measured through three proxies: access to electricity, access to clean cooking fuels and technologies, and renewable energy consumption, which capture accessibility, affordability, and sustainability dimensions (González Bautista et al., 2024). EP_{it-1} is the lagged energy poverty variable, EG_{it} represents economic growth proxied by GDP per capita, and $INST_{it}$ denotes overall institutional quality. Institutional quality is quantified using a composite index derived from six governance indicators—Control of Corruption, Regulatory Quality, Government Effectiveness, Rule of Law, Voice and Accountability, and Political Stability—through Principal Component Analysis. The interaction terms between economic growth and institutional quality capture the differential impact across countries, with γ representing the threshold level of institutional quality

at which economic growth more effectively reduces energy poverty. X_{it} is a vector of control variables and ε_{it} is the error term.

Results

This research anticipates a positive relationship between economic growth and energy access, with institutional quality enhancing this effect. Existing literature indicates that higher-quality institutions strengthen the impact of economic growth on economic poverty reduction (Singh, 2021), and a similar result is expected for energy poverty. Moreover, Nguyen and Su (2022) highlight that robust institutions improve the efficiency of government spending, thereby facilitating greater access to electricity and clean cooking solutions.

Conclusions

Institutional quality is crucial for amplifying the impact of economic growth on reducing energy poverty in sub-Saharan Africa. While economic growth fosters energy access, robust institutions ensure that these gains translate into sustainable improvements through investment, resource allocation, and innovation, especially in renewable energy. As such, policymakers should focus on strengthening institutional frameworks to maximize the benefits of economic growth in addressing energy poverty. These findings align with Sustainable Development Goal 7, highlighting that universal energy access requires both economic progress and institutional reforms that prioritize sustainability and inclusivity.

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