The Impact of Governance and Political Systems on Rural Electrification in Sub-Saharan Africa

Abdukarim Yasin Gureye[1], Bonsa Tamane Tadase[2], & Mohamed Ahmed[3]

[1, 3] School of Rural Development and Agricultural Innovation, Haramaya University Ethiopia

[2] Oromia Bureau of Finance, Ethiopia

DOI: https://dx.doi.org/10.47772/IJRISS.2025.91100354

Received: 27 November 2025; Accepted: 04 December 2025; Published: 11 December 2025

ABSTRACT

Rural electrification remains uneven across Sub-Saharan Africa, reflecting persistent institutional and political challenges. This study evaluates how governance quality and political systems shape rural electricity access in six countries representing both federal and unitary regimes over the period 2003–2022. Using panel data from the World Bank, the analysis applies descriptive statistics, group comparison tests, and multiple regression models to assess the influence of governance indicators and structural factors. The results show that federal countries exhibit higher rural electrification levels than unitary states, and that control of corruption and rule of law are significant predictors of access. A large rural population share strongly reduces access, underscoring enduring structural constraints. The findings demonstrate that governance quality is central to electrification performance and that institutional reforms, strengthened administrative capacity, and context-specific strategies are essential for advancing progress toward universal energy access.

Key word: Control of corruption, Federal systems, rule of law, rural electrification, Sub-Saharan Africa

INTRODUCTION

Access to electricity is a cornerstone of modern economic development and human well-being, enabling improvements in health, education, and economic opportunity (Gaye, 2007). Recognizing its transformative potential, universal access to affordable, reliable, and modern energy is enshrined as a central target of the United Nations' Sustainable Development Goal 7 and is a key pillar of the African Union's Agenda 2063. Globally, electricity access has risen to 91%, signaling significant progress (World Bank, 2024). However, this progress is uneven, and Sub-Saharan Africa remains the least electrified region in the world. Despite consistent growth, increasing from 25.7% in 2000 to 51.59% in 2022, SSA's access rate falls drastically short of the global average and lags behind other regions (World Bank, 2024). This deficit is most acute in rural areas, where the majority of the SSA population resides and where pervasive energy poverty entrenches cycles of deprivation (Nalule, 2018).

The challenge of rural electrification in SSA is not only a technical or financial issue but is deeply intertwined with governance and political structures. A 2024 World Bank report underscores the increasing difficulty of achieving the 2030 SDGs, noting that over a third of targets are stalled or regressing. While 685 million people globally lacked electricity in 2022, projections indicate that 660 million will remain without access by 2030, a majority of whom will be in rural SSA (World Bank, 2024). Stark disparities exist between countries; for instance, rural access ranges from near-universal in Mauritius to a mere 1.3% in Chad (World Bank, 2022). This variation suggests that underlying governance failures including corruption, institutional ineffectiveness, and political instability are significant impediments to closing the rural electrification gap (Rahman, et al., 2013; Boamah, et al., 2021; Calderon, et al., 2018). Consequently, the central problem is that poor governance and

[1] abdiyasing15@gmail.com

[2] bonsatamane123@gmail.com

unsuitable political frameworks are hindering the effective implementation of electrification policies and the equitable allocation of resources, thereby perpetuating energy injustice in rural SSA.

While scholarly work has identified the importance of economic growth (David, 2011) and technological innovation (Mohsin, et al., 2022) in expanding energy access, critical gaps remain in the SSA context. Previous studies often examine governance in broad terms, leaving a gap in understanding the specific mechanisms through which discrete governance indicators such as control of corruption, and rule of law directly influence rural electrification outcomes.

The role of a country's political architecture (e.g., federal versus unitary systems) in shaping electrification strategies and their effectiveness is underexplored in comparative African studies. The distinct challenges of coordination in federal systems (e.g., Nigeria) versus the centralized planning of unitary states (e.g., Rwanda) require further investigation (Bardhan & Mookherjee, 2006; Blimpo & Cosgrove-Davies, 2019). Much of the extant literature on electrification has focused on Asia (e.g., Palit & Bandyopadhyay, 2016; Sovacool, 2010) or on single-country case studies (e.g., Gebremeskel, et al., 2021; Wambui, et al., 2022; Ayodele, et al., 2021). There is a scarcity of multi-country, comparative analyses within SSA that simultaneously account for governance and political system variables. This study addresses this gap collected and analyzed data of SSA countries sourced from international organization, begin with some controversial research questions such as

- What is the overall trend of rural electricity access in SSA?
- Does access to rural electricity vary between federal and unitary Political systems in SSA?
- Does access to rural electricity vary between countries in SSA?
- To what extent do Governance indicators affect access to rural electricity in SSA?

To address the research question, this study analyzed data 6 Sub-Saharan African countries, collected from the World Bank database. By pursuing these research questions, this research contributes to a more sophisticated understanding of the political economy of energy access, ultimately seeking to inform strategies that can fulfill the promise of SDG for the most underserved populations in Sub-Saharan Africa.

This paper is set out as follows: the two following sections respectively provide the literature and hypothesis, and methodology. Section four provides analytical discussions on the empirical results. Finally, in fifth section offers conclusions, implications and limitations.

LITERATURE REVIEW

Rural electrification in Sub-Saharan Africa has long been shaped by the interplay between governance structures, institutional quality, and political systems. A substantial body of research shows that electricity access is not determined solely by technical capacity or financial investment, but by the broader governance environment within which energy policies are formulated and executed. Countries across the region display significant disparities in rural access, and these differences often reflect variations in institutional performance, administrative systems, and political organization.

A central theme in the literature concerns the influence of political systems on infrastructure delivery. Studies comparing federal and unitary governments highlight that decentralization can support more responsive decision-making and localized solutions, particularly when regional authorities possess adequate administrative capacity (Cerniglia, 2003). Federal countries such as South Africa have demonstrated how subnational autonomy can facilitate tailored electrification programs, whereas others, such as Nigeria, face persistent coordination challenges linked to overlapping responsibilities and weak institutional coherence (Field, 2021). Conversely, unitary states can benefit from centralized planning and unified national strategies, yet their effectiveness depends heavily on institutional strength, policy discipline, and consistent political commitment. Mauritius provides an example of successful centralized expansion of access, while countries with weaker administrative

systems, such as Chad or Burundi, struggle to translate national plans into effective implementation (Somanathan, et al., 2014).

Alongside political structures, governance quality emerges as a primary determinant of infrastructure outcomes. Rhodes (1996) conceptualizes governance as networked coordination among state and non-state actors "governing without government" emphasizing interorganizational networks and collaborative policy delivery. North's institutional framework (1990) is foundational for governance scholarship, highlighting how formal rules, informal norms, institutional integrity, predictability, and administrative capacity shape incentives for investment and the effective provision of public goods such as rural electrification. Ostrom (1990) advances the concept of polycentric governance, demonstrating how multiple, overlapping authorities and locally embedded institutions can manage common resources and service delivery more adaptively. Governance theory emphasizes that institutional integrity, predictability, and administrative effectiveness form the foundation for successful public service delivery.

Empirical studies consistently show that corruption undermines infrastructure development by inflating project costs, distorting procurement, reducing maintenance quality, and weakening investor confidence (Adindu, et al., 2020; Ghahari, et al., 2024; Idris, & Salisu, 2016). In the energy sector specifically, corruption is linked to electricity theft, underinvestment, and incomplete project execution, which disproportionately affect rural areas where service provision is already more costly and logistically challenging.

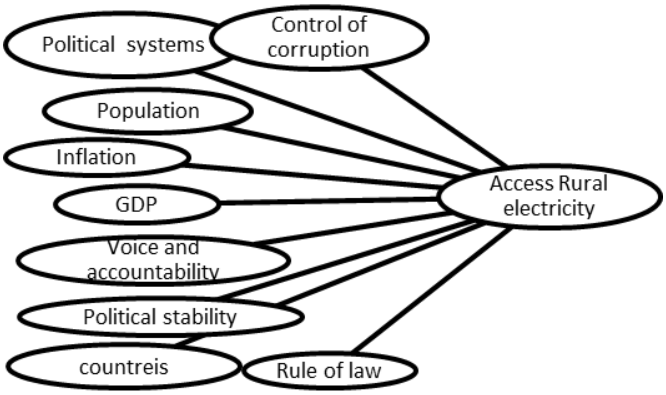
Rule of law is also highlighted as crucial components of effective electrification efforts. A strong legal framework supports contract enforcement, lowers investment risk, and promotes long-term private sector participation (Wisniewski, et al., 2024; Mahmood, et al., 2021). Countries with predictable legal systems and transparent regulatory processes tend to attract more financing for grid expansion and off-grid solutions. At the same time, effective regulation helps build trust between service providers and consumers, promoting cost recovery and system sustainability (Hajilee and Himarios 2013). These institutional features are widely recognized as necessary conditions for scaling rural electrification programs.

Political stability further contributes to a favorable environment for infrastructure development. Although the magnitude of its impact varies across contexts, the literature shows that stability supports policy continuity and lowers investment risk, while instability disrupts service delivery, diverts public resources, and delays long-term planning (Baker, et al., 2019). For electrification an investment-intensive sector requiring multi-year commitments predictable political conditions are particularly important.

Conceptual framework and hypotheses

Despite the growing body of research, comparative studies linking multiple dimensions of governance with political system types in Sub-Saharan Africa remain limited. Consequently, the precise mechanisms through which political structures and institutional performance jointly shape rural electrification outcomes are underexplored at a regional level. This study addresses this gap by integrating robust governance theory with empirical evidence spanning two decades across multiple Sub-Saharan African countries.

Figure 1 Conceptual framework



The conceptual framework posits that rural electrification is fundamentally determined by the interplay between a country's political system (unitary vs. federal structure) and the quality of governance. The political structure provides the foundational architecture, influencing the complexity of policy implementation, while effective governance (characterized by integrity, predictability, and stable institutions) directly facilitates electrification through efficient resource allocation and sustained investment. Conversely, a large rural population share is posited as a structural constraint. This integrated model theorizes that superior electrification outcomes are achieved when a conducive political structure is reinforced by high-quality governance, collectively mitigating demographic and economic challenges. The following hypotheses formalize these proposed relationships.

H1: Rural electricity access significantly differs between federal and unitary political systems in SSA.

H2: Rural electricity access significantly differs across SSAn countries.

H3: Higher levels of control of corruption are positively associated with rural electricity access.

H4: Higher levels of rule of law are positively associated with rural electricity access.

H5: Higher levels of political stability are positively associated with rural electricity access.

H6: Higher levels of voice and accountability are positively associated with rural electricity access.

H7: GDP growth is positively associated with rural electricity access.

H8: Inflation is negatively associated with rural electricity access.

H9: Rural population share is negatively associated with rural electricity access.

RESEARCH CONTEXT AND METHODOLOGY

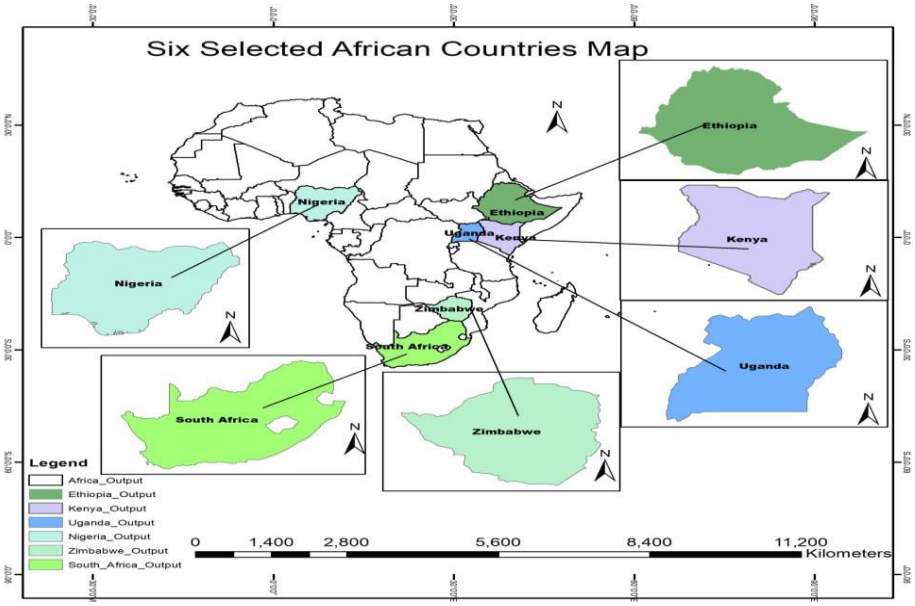
Research context

Electricity access in Sub-Saharan Africa is a complex issue shaped by economic development, political governance, and geographic disparities. Governance, GDP growth, and variations in political systems significantly influence electrification policies and outcomes. Marked differences exist between countries; for example, in 2003, Nigeria experienced a GDP growth rate of 7.35% and a GDP per capita of $763.39, while Ethiopia had negative GDP growth of -2.16% and a GDP per capita of $116.80. Further, variations in political systems, such as Ethiopia, Nigeria, and South Africa operating as federal republics, impact the development and implementation of electrification policies at regional and local levels. Given the predominantly rural population in Sub-Saharan Africa, this research specifically examines the rural electricity access. Data on rural electrification rates and population percentages are analyzed. For example, Ethiopia's rural electrification rate was only 1.4% in 2003, serving a rural population of 84.69%. By 2022, Ethiopia had significantly improved to 43%. In contrast, South Africa had a rural electrification rate of 66.3% in 2003, reaching 93.4% in 2022, demonstrating a smaller access gap. Analyzing changes in access over time, in countries such as Ethiopia, Kenya, and Nigeria, helps highlight the diverse pathways and rates of electrification across the region. The results provide crucial information for identifying the factors driving successful electrification strategies and promoting equitable access to electricity for all.

Research methodology

This study used a mixed-methods, explanatory and descriptive design, employing quantitative analysis of World Bank panel data to analyze electricity access in Sub-Saharan Africa. Descriptive statistics were used to characterize and summarize electricity access and inferential analysis explored relationships between governance, economics, and electricity access. Using a stratified sample of six countries selected from two political regime types: federal republics (South Africa, Ethiopia, Nigeria) and unitary states (Kenya, Uganda, Zimbabwe), based on availability of data. This approach ensures representation of diverse governance structures within the region's broader population of countries.

Figure 2 Map of the study area



This study utilizes secondary data obtained from the World Bank. Electricity access data were sourced directly from World Bank indicators.[2] Governance indicators, were obtained from the World Bank's Worldwide Governance Indicators[3]. Control variables, were sourced from the World Bank's World Development Indicators[2]. Data were collected for the years 2003-2022 and compiled into a panel dataset, with each observation representing a specific country-yea. Data analysis was conducted using SPSS. Descriptive statistics, including trends and percentages, were used to summarize the data. Inferential statistics were then employed: t-tests and ANOVA were used for group comparisons, and regression models were used to analyze the relationships between electricity access, governance indicators, and economic factors.

Table 1. Summary of Variables and Measurements

Variable Category	Variable Name & Code	Measurement
Dependent	Rural Electricity Access	% of rural population
Independent	Voice & Accountability	Units on a scale from -2.5 to +2.5
	Political Stability	
	Rule of Law	
	Control of Corruption	
Control	Economic Development	GDP per capita (current US$)
	Economic Growth	GDP growth (annual %)
	Inflation	Inflation, GDP deflator (annual %)
	Demographic Structure	Rural population (% of total population)

[2] https://databank.worldbank.org/source/world-development-indicators/Type/TABLE/preview/on
[3] https://www.worldbank.org/en/publication/worldwide-governance-indicators

RESULT AND DISCUSSION

Descriptive analysis

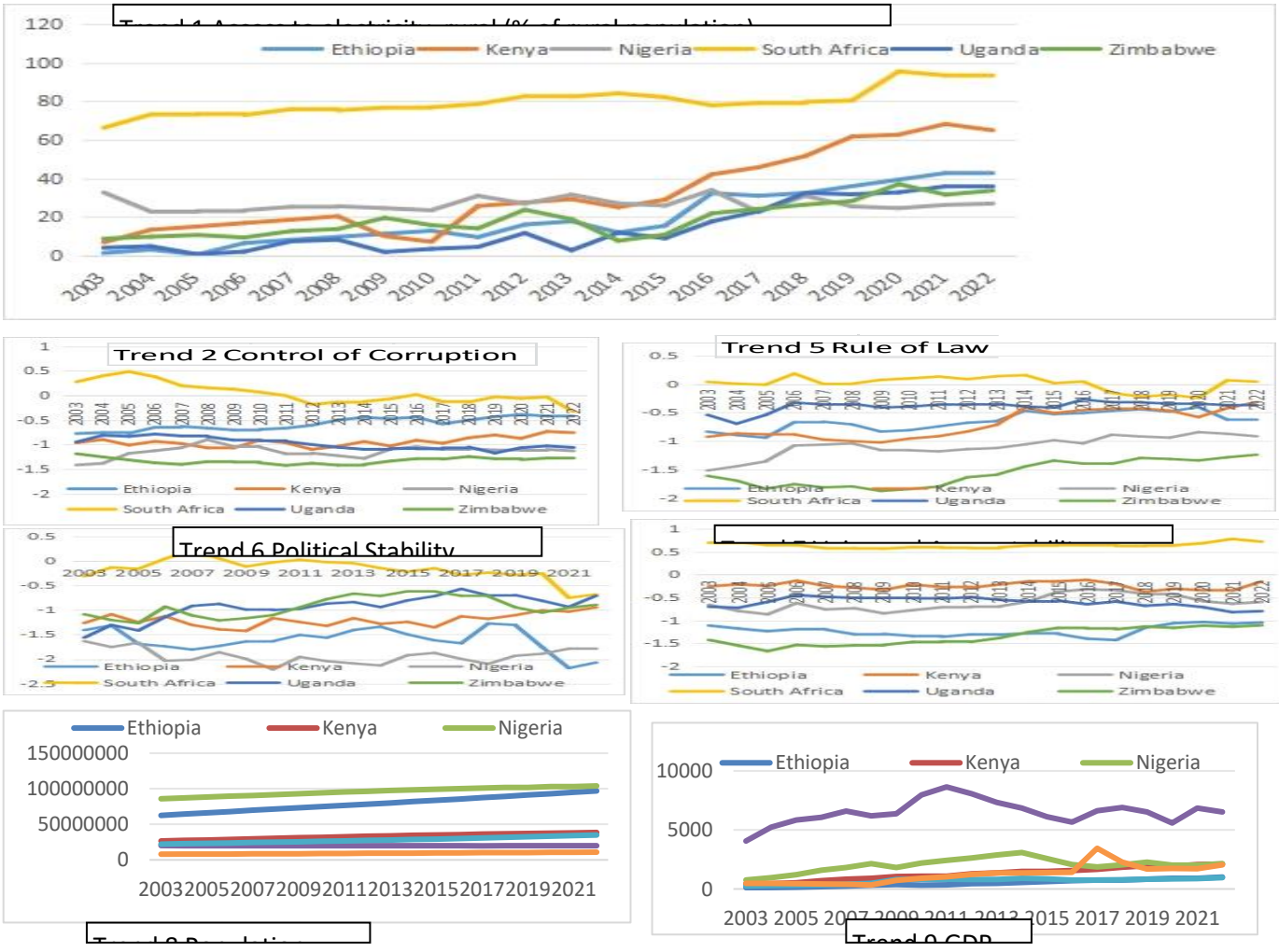
Trend analysis

Analysis of rural electricity access from 2003 to 2022 reveals that South Africa consistently maintains the highest access rates. However, while Kenya exhibits notable gains and the largest overall percentage gain (increasing from 6.9% to 65%), especially after 2014, Ethiopia demonstrated the most significant overall increase in percentage points (41.6). Zimbabwe experienced a steady increase initially but has since declined in recent years, and Nigeria had a reduction at -5.7% (32.7%, 2003 to 27%, 2022) Uganda and Zimbabwe generally experience lower levels, and Ethiopia and Nigeria, while starting low, exhibit steady growth. Overall, the combined data suggests a positive trajectory in rural electrification across the analyzed countries (Trend 1).

Depicting governance indicator scores (using the WGI scale of -2.5 to 2.5) from 2003-2022, trends 2-7 reveal that most countries' scores fluctuate within a narrow range over time. South Africa generally scores higher than others across most governance indicators, though a decline is observed in recent years. In contrast, Ethiopia, Uganda, and Zimbabwe generally have lower scores compared to Kenya and Nigeria.

Population trends (Trend 8) from 2003-2021 show a consistent increase across all countries, with Nigeria exhibiting a significantly larger and more rapidly growing population. GDP trends (Trend 9) reveal a generally positive trajectory but fluctuating growth, with South Africa consistently maintaining the highest GDP among the countries analyzed.

Trend 1-9; Trend analysis



Descriptive Statistics

The descriptive statistics indicate that the governance indicators (Control of Corruption, Rule of Law, Political Stability, and Voice and Accountability) have negative mean values (Table 1). GDP per capital exhibits a mean of 2043.9274, while Inflation has a mean of 21.2486 and rural population has a large mean of 44322658.1167. Access to electricity in rural areas has a mean of 31.84, In 2003, South Africa had the highest rural electricity access (66.3%), while Ethiopia had the lowest (1.4%). By 2022, South Africa remained highest (93.4%) Table 2.

Table 2 Descriptive Statistics

.	Minimum	Maximum	Mean	Std. Deviation
Control of Corruption	-1.43	.48	-.8211	.46811
Rule of Law	-1.87	.18	-.7287	.53068
Political Stability	-2.21	.22	-1.1321	.59605
Voice and Accountability	-1.67	.78	-.5695	.67815
Access to electricity, rural	.60	95.50	31.84	25.52
GDP per capital	116.80	8646.06	2043.93	2153.72
Inflation	-2.02	604.95	21.25	65.87
Rural population	8014740	103718305	44322658.12	32553728.40

Group comparison tests

Access to electricity Variation Between countries

The ANOVA results ($F(5, 114) = 76.756$, $p < 0.001$) indicate a statistically significant difference in rural electricity access between the countries in Sub-Saharan Africa included in the analysis. This supports the hypothesis that access to electricity in rural areas significantly varies between these countries, the hypothesis is accepted.

Table 1 Variation Between countries.

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	59740.286	5	11948.057	76.756	.000
Within Groups	17745.527	114	155.663		
Total	77485.	119			

Access to Electricity Variation between Regime

The statistical analysis reveals a significant difference in rural electricity access between federal (41.94%) and unitary (21.73%) regimes in Sub-Saharan Africa, with a significance value of 0.00 and a t-statistic of 4.71. This supports the hypothesis that access to electricity in rural areas significantly varies between these regime, the hypothesis is accepted.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue XI November 2025

Table 2 Variation between Regimes

	Regimes	N	Mean	T	Df	Sig. (2-tailed)
Access to electricity, rural	Federal	60	41.9383	4.71	118.00	.000
	Unitary	60	21.7317			

Multiple Regression Analysis

The analysis utilized a panel dataset of 120 observations (6 countries over 20 years). The mean rural electricity access rate was 31.84% (±25.52), indicating significant disparities across the sample. The governance indicators consistently showed negative mean values, aligning with typical scores for many Sub-Saharan African nations on the -2.5 to 2.5 WGI scale (Kaufmann et al., 2010). A multiple linear regression was conducted to predict rural electricity access based on seven predictors: six governance indicators and GDP growth. The overall regression model was statistically significant, $F(7, 112) = 66.16$, $p < .001$. The model explained a substantial portion of the variance in rural electrification, with $R^2 = .805$ and Adjusted $R^2 = .793$. The results of the regression analysis are presented in Table 4. Contrary to the previous model, this specification, which substitutes GDP per capita with GDP growth, reveals a more pronounced and statistically significant role for several governance indicators.

Table 4. Regression Coefficients for Predictors of Rural Electricity Access (Model with GDP Growth).

Predictor	Unstandardized B	Std. Error	Standardized Beta (β)	t-value	p-value	VIF
(Constant)	111.12	6.76		16.43	<.001	
Control of Corruption	10.62	4.43	0.195	2.40	.018	3.80
Rural Population Share	-0.88	0.11	-0.556	-7.69	<.001	3.00
Voice and Accountability	2.19	3.49	0.058	0.63	.530	4.94
Political Stability	4.39	2.27	0.103	1.94	.055	1.62
Inflation	0.038	0.017	0.098	2.24	.027	1.11
Rule of Law	10.42	4.67	0.217	2.23	.028	5.44
GDP Growth	0.008	0.223	0.002	0.03	.973	1.28

Source: Authors constructed (spss 2025)

Significant Predictors:

Control of Corruption: This variable was a positive and significant predictor ($B = 10.62$, $\beta = 0.195$, $p = .018$). This finding provides strong support for literature, confirming that better control of corruption is associated with higher rural electricity access. This aligns with theory that corruption diverts public resources, inflates project costs, and deters investment, thereby crippling infrastructure development. The result suggests that anti-corruption efforts are directly relevant to achieving electrification goals.

Rule of Law: A strong, positive, and significant relationship was found ($B = 10.42$, $\beta = 0.217$, $p = .028$). This provides clear support for literature. A robust rule of law creates a predictable environment for enforcing contracts and protecting investments, which is crucial for attracting the long-term capital required for energy infrastructure.

Rural Population Share: This variable remained a powerfully significant and negative predictor (B = -0.88, β = -0.556, p < .001). This underscores the immense structural challenge of electrifying countries where a large proportion of the population lives in dispersed, rural communities, making grid extension economically challenging.

Inflation: Surprisingly, inflation showed a small but significant positive coefficient (B = 0.038, p = .027). This counterintuitive result may reflect complex economic conditions or be an artifact of the model specification, as high inflation is typically detrimental to investment.

Non-Significant and Borderline Predictors:

GDP Growth: Unlike GDP per capita, annual GDP growth was not a significant predictor (p = .973). This suggests that the *level* of economic development (wealth stock) is a more critical determinant of rural electrification infrastructure than short-term economic *fluctuations* (growth flow).

Political Stability: This variable approached significance (p = .055), hinting that stability may be important, but its effect is not as clear as that of corruption control or rule of law in this model.

Voice and Accountability: Was not significant (p = .530), suggesting that in this specific context and model, electoral democracy and civil liberties may have a less direct impact on electrification outcomes than the quality of institutional enforcement (Rule of Law) and integrity (Control of Corruption).

Discussion

The findings of this study provide clear evidence that governance quality and political structures are central determinants of rural electricity access in Sub-Saharan Africa. Drawing on governance theory, institutional economics, and empirical literature, the results reinforce the notion that electrification outcomes are shaped not only by technical and financial variables but also by the broader institutional environment within which energy policies are designed and implemented.

The analysis confirms substantial variation in rural electricity access across the six Sub-Saharan African countries examined. This aligns with prior evidence showing that electricity access in SSA remains highly uneven due to institutional capacity differences, resource allocation priorities, and political commitment (World Bank 2024). ANOVA results reveal statistically significant structural disparities in governance and policy implementation. Regarding rural electricity access (2003–2022), South Africa consistently recorded the highest rates. Kenya made the largest proportional gain (especially post-2014), while Ethiopia saw the biggest absolute percentage point increase. Zimbabwe showed initial growth but recently declined, remaining low alongside Uganda. Overall, the region's positive trend is primarily driven by strong gains in Kenya and substantial improvements in Ethiopia.

The study also finds a significant gap between federal and unitary political regimes. Federal states reported higher average rural access (41.94 percent) compared with unitary states (21.73 percent). This finding corresponds with governance theory, which suggests that decentralized structures allow subnational governments greater autonomy to tailor electrification initiatives to local conditions. However, it also reflects recent empirical patterns where certain federal systems, such as South Africa, have leveraged stronger institutions and coordinated policies to advance electrification, while others like Nigeria continue to struggle with fragmentation (Mettler, & Brown, 2022).

The regression results demonstrate that governance quality is a decisive force shaping rural electricity access. Three governance indicators control of corruption, rule of law, and political stability emerged as central predictors, although with varying statistical significance.

Control of corruption shows a positive and significant relationship with rural electricity access. This finding aligns with theoretical expectations that corruption distorts resource allocation, inflates infrastructure costs, delays project delivery, and reduces investor confidence (Idris, & Salisu, 2016). Empirical studies similarly show

that corruption undermines service delivery and infrastructure expansion, particularly in capital-intensive sectors like electricity (Adindu, et al., 2020). The results suggest that reducing corruption is not merely a governance aspiration but an operational requirement for achieving SDG 7 in rural Africa.

Rule of law also has a strong and significant positive effect. The result is consistent with institutional economics, where predictable legal environments encourage long-term investment by reducing regulatory uncertainty (Wisniewski, et al., 2024; Mahmood, et al., 2021). Countries with stronger rule of law are better positioned to attract private capital for grid expansion and maintain credible regulatory frameworks that support electrification.

Although political stability did not reach statistical significance at the conventional five percent threshold, its borderline significance suggests that stability remains a relevant factor shaping infrastructure outcomes. Prior literature shows that instability deters investment, disrupts public services, and increases operational risks in infrastructure development (Masry, 2015). The results suggest that while political stability matters, its effect may be mediated by other governance dimensions such as corruption control.

The governance indicators voice and accountability did not display significant statistical relationships. This does not necessarily imply their irrelevance; instead, it suggests that electoral participation or regulatory design may exert more indirect or long-term influences compared with more immediate institutional factors, such as corruption control and rule of law. Prior research similarly notes that improvements in democratic accountability often take time to translate into tangible service delivery outcomes.

The strong negative association between rural population share and electricity access confirms long-standing empirical arguments that dispersed rural populations impose high infrastructure costs and operational challenges (Xia, et al., 2022). This result highlights structural development constraints that are less amenable to policy reform alone. It also underscores the importance of off-grid and mini-grid solutions as central strategies for SSA countries with large rural populations.

GDP growth did not significantly predict electricity access, suggesting that short-term economic performance does not directly translate into infrastructure expansion. This aligns with findings that income level (wealth stock) matters more than year-to-year growth volatility when financing electrification (Milin, et al., 2022). The unexpected positive coefficient for inflation, though statistically significant, reflects macroeconomic complexities rather than a substantive causal relationship. Inflation is typically detrimental to infrastructure investment, implying that this result should be interpreted with caution.

CONCLUSION AND RECOMMENDATIONS

This study set out to examine how governance quality and political systems shape rural electrification outcomes in Sub-Saharan Africa. The findings demonstrate that access to electricity remains uneven across countries in the region, reflecting structural, institutional, and political differences. Federal countries recorded significantly higher rural electrification rates than unitary states, suggesting that decentralized governance can support more responsive and coordinated implementation when institutional capacity is strong. The results indicate that governance indicators play a central role in determining access outcomes. Control of corruption and rule of law emerged as strong and significant predictors, highlighting the importance of integrity, transparency, and predictable legal environments for attracting investment and managing infrastructure development effectively. Although political stability did not reach full significance, its near-significant effect suggests that stable political environments continue to facilitate long-term planning and investor confidence.

In contrast, voice and accountability did not show significant empirical influence within the model, implying that their impact may occur indirectly or over extended periods. The negative association between rural population share and electricity access reaffirmed the long-standing challenge of electrifying geographically dispersed communities, where the high cost of grid extension remains a key barrier. The absence of a significant relationship between GDP growth and access further suggests that short-term economic performance is less relevant to electrification than deeper structural and institutional conditions.

Overall, the study confirms that governance is not an auxiliary factor but a foundational element in advancing rural electrification. Strengthening corruption control mechanisms, improving rule of law, and enhancing institutional capacity should therefore form integral components of national electrification strategies. Countries with large rural populations should complement grid extension with decentralized solutions, particularly mini-grids and off-grid systems. Federal systems may benefit from further strengthening coordination across national and subnational levels, while unitary states should invest in building strong administrative systems capable of executing national plans effectively. Integrating governance reforms into sector strategies will improve the credibility, efficiency, and sustainability of electrification efforts across the region.

Limitations and Future Research

While the study offers meaningful insights, several limitations should be acknowledged. The analysis focused on six countries, which allows for detailed assessment but limits the broader applicability of the findings to all Sub-Saharan African states. The reliance on secondary data from World Bank sources means that informal governance dynamics, local political factors, and context-specific administrative challenges may not be fully captured. Measurement limitations inherent in perception-based governance indicators may also influence interpretation of the results. In addition, the quantitative approach used here, while robust, does not provide the depth of understanding that qualitative or mixed methods research could offer, particularly in explaining why certain governance systems deliver better electrification outcomes than others.

These limitations create useful avenues for further research. Future studies could expand the sample to include a wider set of countries and political systems, allowing for broader comparative assessment. Incorporating qualitative evidence through interviews, case studies, or institutional analyses would help reveal how governance processes operate in practice and how they influence implementation performance. Further work could also examine sector-specific governance reforms, such as tariff adjustments, independent regulatory agencies, or public–private partnership frameworks, and how they shape electrification progress. As off-grid and mini-grid technologies continue to expand, additional research is needed to understand how governance quality affects their deployment and sustainability. Finally, long-term political economy analyses could shed light on how political incentives, regime stability, and leadership dynamics shape investment decisions and policy continuity in the electricity sector

REFERENCE

1. Adindu, C., Diugwu, I., Yusuf, S., Musa, M. (2020). Issues of Corruption in Construction Projects and Infrastructure Development in Nigeria: An Empirical Approach. https://doi.org/10.1007/978-3-030-41979-0_14
2. Ayodele, T. R., Ogunjuyigbe, A. S. O., Ajayi, O. D., Yusuff, A. A., & Mosetlhe, T. C. (2021). Willingness to pay for green electricity derived from renewable energy sources in Nigeria. *Renewable and Sustainable Energy Reviews, 148*, 111279. https://doi.org/10.1016/j.rser.2021.111279
3. Baker, N. B., Khater, M., & Haddad, C. (2019). Political stability and the contribution of private investment commitments in infrastructure to GDP: An institutional perspective. Public Performance & Management Review, 42(4), 808-835. https://doi.org/10.1080/15309576.2018.1523064
4. Bardhan, P., & Mookherjee, D. (Eds.). (2006). Decentralization and local governance in developing countries: A comparative perspective. MIT Press. online
5. Blimpo, M. P., & Cosgrove-Davies, M. (2019). Electricity access in Sub-Saharan Africa: Uptake, reliability, and complementary factors for economic impact. World Bank. Online
6. Boamah, F., Williams, D. A., & Afful, J. (2021). Justifiable energy injustices? Exploring institutionalised corruption and electricity sector "problem-solving" in Ghana and Kenya. *Energy Research & Social Science, 73*, 101914. https://doi.org/10.1016/j.erss.2021.101914
7. Calderon, Cesar A. and Cantu, Catalina and Chuhan-Pole, Punam, Infrastructure Development in Sub-Saharan Africa: A Scorecard (May 2, 2018). World Bank Policy Research Working Paper No. 8425, Available at SSRN: https://ssrn.com/abstract=3172503
8. Cerniglia, F. (2003). Decentralization in the public sector: quantitative aspects in federal and unitary countries. *Journal of Policy Modeling, 25*(8), 749-776. https://doi.org/10.1016/S0161-8938(03)00069-3

9. David I. Stern. 2011. The role of energy in economic growth in "Ecological Economics Reviews." Robert Costanza, Karin Limburg & Ida Kubiszewski, Eds. *Ann. N.Y. Acad. Sci.* 1219: 26–51. https://doi.org/10.1111/j.1749-6632.2010.05921.x
10. Field, T. L. (2021). A just energy transition and functional federalism: The case of South Africa. *Transnational Environmental Law*, *10*(2), 237-261. DOI: https://doi.org/10.1017/S2047102520000436
11. Gaye, A. (2007). Access to energy and human development. *Human development report*, *2008*, 2007.
12. Gebremeskel, D. H., Ahlgren, E. O., & Beyene, G. B. (2021). Long-term evolution of energy and electricity demand forecasting: The case of Ethiopia. *Energy Strategy Reviews*, *36*, 100671. https://doi.org/10.1016/j.esr.2021.100671
13. Ghahari, S. A., Queiroz, C., Labi, S., & McNeil, S. (2024). Corruption propensity and mitigation at different phases of infrastructure development. *Public Works Management & Policy*, *29*(1), 5-44. https://doi.org/10.1177/1087724X231162544
14. Idris, M., & Salisu, S. J. (2016). Corruption and infrastructural development in Nigeria. *International Journal of Arts & Sciences*, *9*(1), 135. Online
15. Mahmood, H., Tanveer, M., & Furqan, M. (2021). Rule of law, corruption control, governance, and economic growth in managing renewable and nonrenewable energy consumption in South Asia. *International Journal of Environmental Research and Public Health*, *18*(20), 10637. https://doi.org/10.3390/ijerph182010637
16. Masry, M. (2015). The role of political stability in achieving economic development. *Journal of Economics and Sustainable Development*, *6*(16), 134-153. Online
17. Mettler, S., & Brown, T. (2022). The growing rural-urban political divide and democratic vulnerability. *The ANNALS of the American Academy of Political and Social Science*, *699*(1), 130-142. https://doi.org/10.1177/00027162211070061
18. Milin, I. A., Mungiu Pupazan, M. C., Rehman, A., Chirtoc, I. E., & Ecobici, N. (2022). Examining the relationship between rural and urban populations' access to electricity and economic growth: a new evidence. *Sustainability*, *14*(13), 8125. https://doi.org/10.3390/su14138125
19. Mohsin, M., Taghizadeh-Hesary, F., Iqbal, N., & Saydaliev, H. B. (2022). The role of technological progress and renewable energy deployment in green economic growth. *Renewable Energy*, *190*, 777-787. https://doi.org/10.1016/j.renene.2022.03.076
20. Nalule, V. R. (2018). *Energy poverty and access challenges in sub-Saharan Africa: The role of regionalism*. Springer. Onlne
21. Palit, D., & Bandyopadhyay, K. R. (2016). Rural electricity access in South Asia: A critical review. Renewable and Sustainable Energy Reviews, 60, 1505–1515. https://doi.org/10.1016/j.rser.2016.03.034
22. Rahman, M. M., Paatero, J. V., Poudyal, A., & Lahdelma, R. (2013). Driving and hindering factors for rural electrification in developing countries: Lessons from Bangladesh. *Energy Policy*, *61*, 840-851. https://doi.org/10.1016/j.enpol.2013.06.100
23. Somanathan, E., Sterner, T., Sugiyama, T., Chimanikire, D., Dubash, N. K., Essandoh-Yeddu, J. K., ... & Zylicz, T. (2014). National and sub-national policies and institutions. Official URL: http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/i...
24. Sovacool, B. K. (2010). A critical evaluation of nuclear power and renewable electricity in Asia. Journal of Contemporary Asia, 40(3), 369–400. https://doi.org/10.1080/00472331003798350
25. Wambui, V., Njoka, F., Muguthu, J., & Ndwali, P. (2022). Scenario analysis of electricity pathways in Kenya using Low Emissions Analysis Platform and the Next Energy Modeling system for optimization. *Renewable and Sustainable Energy Reviews*, *168*, 112871. https://doi.org/10.1016/j.rser.2022.112871
26. Wisniewski, R., Nowakowska-Krystman, A., Kownacki, T., & Daniluk, P. (2024). The Impact of the Rule of Law on Energy Policy in European Union Member States. *Energies*, *17*(3), 739. https://doi.org/10.3390/en17030739
27. Xia, X., Sun, H., Yang, Z., Yuan, W., & Ma, D. (2022). Decoupling analysis of rural population change and rural electricity consumption change in China. *International Journal of Environmental Research and Public Health*, *19*(11), 6676. https://doi.org/10.3390/ijerph19116676