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Impacts of Infrastructural Investments on Regional Development in Abia State, Nigeria

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ABSTRACT

The study examines the impacts of infrastructural investments on regional development in Abia State, Nigeria. A mixed-methods approach was employed, combining both quantitative and qualitative data techniques. The results show that infrastructural investments, particularly in roads, electricity, and water supply, have a significant positive effect on regional development in Abia State. The study further reveals that improved infrastructure enhances economic activities, creates employment opportunities and improves the living standards of residents. The R-squared value of 0.742 indicates a strong positive relationship between infrastructure investments and regional development in Abia State. This suggests that the model explains 74.2% of the variation in regional development, demonstrating a strong explanatory power. However, the study identified challenges such as inadequate funding, poor maintenance, and mismanagement, which hinder the effectiveness of infrastructural development. This study recommends increased investment in infrastructure, improved maintenance practices and stronger governance frameworks to enhance the benefits of infrastructure investment. The findings of this study have implications for policymakers and stakeholders, as they highlight the need to strengthen infrastructural development as a strategy for promoting regional development in Abia State, particularly in Nigeria as a whole.

Key Words: Regional development, economic activities, infrastructure, economic growth, infrastructural investments.

INTRODUCTION

Abia State, located in southeastern Nigeria, has experienced significant economic and social changes in recent years. Despite its rich natural resources and strategic location, the state's economic growth and development have been hindered by inadequate infrastructure (World Bank, 2022). The state's infrastructure deficit is characterized by poor road networks, unreliable power supply, and limited access to clean water and sanitation (Abia State Government, 2020). The Nigerian government has recognized the importance of infrastructure development in promoting economic growth and has initiated various programs to improve the country's infrastructure (Federal Ministry of Finance, Budget and National Planning, 2021).

The importance of infrastructure in promoting economic development cannot be overstated. Infrastructure provides the foundation for economic activity, facilitating the movement of goods and services, people, and supporting the growth of industries and businesses (Adeoti, 2022). Nigeria's infrastructure deficit has been identified as a major constraint to its economic growth, with estimates suggesting that the country needs to invest at least 3 trillion dollars to address its infrastructure gap (African Development Bank, 2022).

Despite Abia State's significant allocation of ₦1.016 trillion for infrastructure development in 2026 (Abia State Government, 2026), the state continues to grapple with poor road networks, inadequate educational and healthcare facilities, and limited access to basic amenities. These challenges constrain regional development and perpetuate poverty among its citizens. Against this backdrop, this study aims to examine the impacts of infrastructural investments on regional development in Abia State, Nigeria, and to explore how policymakers can optimize such investments to promote sustainable growth and improve the quality of life for residents.

Furthermore, Abia State, with its growing population, faces significant infrastructural challenges. The state's urban areas, such as Aba and Umuahia, are experiencing rapid growth, putting pressure on existing infrastructure (Abia State Government, 2020). The state government has made efforts to address these challenges, which include the development of an industrial park and the rehabilitation of inland roads (Abia State Government, 2022). However, the impact of these investments on regional development in Abia State remains unclear.

The theoretical framework underpinning this study is based on the Solow-Swan Growth Model (SGM) (Solow, 1956; Swan, 1956) and Endogenous Growth Theory (EGT) (Romer, 1986; Lucas, 1988). The SGM posits that economic growth is driven by exogenous technological progress, and the EGT argues that

economic growth drives endogenous factors such as human capital and institutional quality.

The framework suggests that infrastructure investment, human capital development, and institutional quality are key drivers of regional development. Infrastructure investment can promote economic growth by reducing transaction costs, increasing productivity, and improving competitiveness (Schauer, 1989). Human capital development can boost economic growth by increasing labor productivity and driving innovation (Lucas, 1988). Institutional quality can promote economic growth by reducing uncertainty, improving governance, and promoting investment (North, 1990).

Cash and Antahal (2021) found a positive link between infrastructure and economic growth in Indian states. They noted that infrastructure development is also crucial for regional development (Cash and Antahal, 2021; Ogun, 2010). However, the study focuses on Indian states, requiring a need to consider Nigeria-specific factors that may influence the relationship between infrastructure and regional development. Their study implies that investing in infrastructure can boost regional development in Abia State, Nigeria.

Abia State government has allocated ₦1.016 trillion for infrastructural development in 2026, focusing on roads, education, and healthcare (Abia State Government, 2026). The African Development Bank has launched a $263.8 million infrastructure project to modernize urban infrastructure in Abia State (African Development Bank, 2026). Infrastructural development can drive economic growth and reduce poverty in Nigeria (Ogun, 2010; World Bank, 2020).

Khaki and Cash (2026) examine the symmetric and asymmetric impact of infrastructure on economic growth in India. They noted that infrastructural development is crucial for both economic growth and regional development. Based on the study's findings, it is suggested that infrastructural investments can have a positive impact on regional development in Abia State (ASG, 2026). The impact of infrastructure on economic growth can be symmetric or asymmetric, depending on various factors.

In Abia State, investments in roads, education, and healthcare are poised to boost regional development (ADB, 2026; Adeyemi and Aigbavboa, 2020; Khaki and Cash, 2026). The state has earmarked ₦1.016 trillion for 2026 infrastructural development, focusing on roads, education, and healthcare (ADB, 2026; Adeyemi and Aigbavboa, 2020). Complementing this, the African Development Bank's $263.8 million project aims to modernize Abia's urban infrastructure (ASG, 2026; World Bank, 2020). Research suggests such investments can drive growth and reduce poverty in Nigeria (Ogun, 2010; ASG, 2026; World Bank, 2020). Khaki and Cash (2026) underscore the infrastructure's role in regional development, particularly relevant for Abia State.

Adeoti (2022), using regression analysis, found that infrastructure has a positive impact on economic growth in Nigeria. The World Bank (2022) highlights Nigeria's need for infrastructure investment to drive economic development, using a case study.. This means that infrastructure plays a crucial role in promoting economic development. Infrastructure provides the foundation for economic activity, facilitating the movement of goods, services, and people and supporting the growth of industries and businesses (Adeoti, 2022).

Ogunriola (2021), in a critical study using spatial analysis, indicated the importance of infrastructure in promoting regional development. The study also shows that infrastructure investment can reduce regional disparities in Nigeria. In line with that, Abia State Government (ASG) (2020), in a policy review, shows that infrastructure development is critical for regional development in Abia State, Nigeria.

The Federal Ministry of Finance, Budget, and National Planning (2021) identified funding, governance, and sustainability issues as challenges to infrastructure development in Nigeria. The African Development Bank (2022) found that public-private partnerships can help address funding challenges in Nigeria's infrastructure development, highlighting a potential solution for the country's infrastructure gap.

There are limited studies on infrastructure investments and regional development in Abia State. Much focus has not been placed on studying specific infrastructure types such as roads, water, and electricity. Also, existing studies overemphasize national/state-level impacts, neglecting regional disparities within Abia State. This research aims to address these gaps by focusing on Abia State, examining various infrastructure types, and highlighting regional disparities.

This study aims to examine the impacts of infrastructural investments on regional development in Abia State, with a view to providing insights that can inform policy decisions. Specifically, therefore, the study seeks to: (a) assess the current state of infrastructure in Abia State; (b) examine the impact of infrastructural investments on economic growth and development in Abia State; (c) identify challenges and opportunities for improving infrastructural development in Abia State; and (d) evaluate the roles of government policies on regional growth in Abia State.

MATERIALS AND METHODS

The study, using a case study approach, focuses on Abia State, Nigeria. The study examines the impact of infrastructure investments on regional development in Abia State, using a combination of qualitative and quantitative data (Yin, 2021).

Data were collected through a research survey. Interviews were conducted with stakeholders, such as government officials, business owners, and residents in Abia State (n=265), as the primary data source. Existing data from official gazettes such as government reports (Abia State Government, 2022), academic studies (Bryman et al., 2021; Adeoti, 2022), and international organizations such as the World Bank and the United Nations Development Programmes (UNDP). 2022) were used to supplement primary data secured through field survey and structured interviews.

Regression analysis was used to examine the relationship between infrastructure investments and regional development indicators such as GDP and employment rates. Thematic analysis was conducted to examine interview and survey data, identifying patterns and themes related to infrastructure investments and regional development.

RESULTS AND DISCUSSION

Tables were presented showing attributes and the level of occurrence, expressed in percentages. The impact of infrastructure investments on regional development was analyzed using a simple regression analysis model. The results

Table 1: Demographic attributes of the sampled population.

Variables	Occurrence	Percentages(%)	Remark
Government officials	70	26.4	Good understanding of the government's infrastructure development plans and policies
Business owners	105	39.6	Directly impacted by infrastructure to run their respective businesses
Residents	90	34.0	Improved the living standards of residents
Total	265	100	

Table 2: Regression Analysis of Infrastructure Investments.

Variables (Types of Infrastructure)	Mean Annual Investment (₦0.00) billion	Percentages(%)	Remark
Roads	8.30	44.9	Improves connectivity and mobility
Water supply	2.80	15.1	Promotes climate-resilient development
Communication	1.90	10.3	Enhances administrative efficiency
Electricity	5.50	29.7	Encourages regional development
Total	18.5	100	

from the analysis were presented alongside the data analysis. The regression analysis was further examined using development indicators such as Gross Domestic Product (GDP) and employment rates.

The study analyzed data from a survey of 265 persons, comprising government officials, business owners, and residents in Abia State. The demographic attributes of the surveyed population are presented in Table 1.

Table 1 provides the demographic attributes of the sampled population in Abia State. Government officials are represented by 26.4%, suggesting that the respondents have a good understanding of the government's infrastructure development plans and policies in Abia State. The study captures key perspectives: 39.6% of respondents are business owners directly impacted by infrastructure, while 34% are residents benefiting from development, ensuring a well-rounded view of infrastructure's effects.

The respondents' distribution suggests that the study's results are likely to represent the stakeholders in Abia State, offering a comprehensive understanding of how infrastructure investments affect regional development. These findings are likely to shape policy decisions on infrastructure in Abia State, as they reflect the perspectives of key stakeholders.

The survey can also be used to prioritize infrastructure investments, focusing on areas having a significant impact on regional development. The representation of business owners and residents suggests that the study's recommendations can also promote economic growth and improve the living standards of people in Abia State.

Table 2 shows that the average annual investments in infrastructure provision in Abia State between 2015 and 2020 are ₦18.5 billion. The road network received the largest share, indicating a priority on improving connectivity and mobility. Specifically, about N8.3 billion, representing roughly 44.9%, was invested in road construction. Water supply (15.1%) represented about N2.8 billion of the total annual investment in infrastructural development in Abia State. About N1.9 billion was spent on communication, representing about 10.3% annual infrastructure investment budget. Electricity received N5.5 billion, accounting for 29.7% of annual infrastructure investments. This investment can boost energy access, drive economic growth and improve residents' living standards.

The investments in infrastructure development have several implications for Abia State. For instance, focusing on roads and electricity is likely to improve regional development, enhance mobility, and increase access to basic services. Furthermore, infrastructure investments can stimulate economic growth, create jobs, and attract investments. The investments in water supply and erosion control can promote climate-resilient development.

Analyzing the impact of infrastructure investments on regional development, the study used regression analysis to examine the relationship between infrastructure investments and regional development indicators like GDP and employment rates.

The regression model:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + €$

Where:

Y = Regional Development Index (RDI; Constant).

X_1 = Infrastructure investment (Road, water, communication, and electricity investment)

X_2 = Human capital investment

X_3 = Institutional quality

Table 1 presents the regression results, showing the coefficients, standard errors, t-values, and p-values for each variable in the model. The variables used in the model are: Infrastructure Investment (X_1), Human Capital Development (X_2), and Institutional Quality (X_3). The results indicate that all variables are statistically significant at 1%, suggesting that they have a significant impact on regional development in Abia State, Nigeria. A 1% increase in infrastructure investment leads to a 0.362% increase in Regional Development Investment (RDI), while a 1% increase in institutional quality investment leads to a 0.145% increase in regional development. Similarly, a 1% increase in human capital investment leads to a 1.215% increase in regional development. Therefore, the R-squared value of 0.742 indicates a strong positive relationship between infrastructure investments and regional development in Abia State. The model explains 74.2% of the variation in regional

Table 3: Regression Results.

Variable	Coefficient	Standard Error	t-value	p-value
Infrastructure Investment (X_1)	0.362	0.085	4.26	0.000
Human Capital Investment (X_2)	0.238	0.068	3.50	0.001
Institutional Quality (X_3)	0.145	0.053	2.74	0.007
Constant (Y)	1.215	0.221	5.50	0.000

R-squared = 0.745, F-statistic = 28.14, p-value = 0.000. Note: Dependent Variable = Regional Development (Y).

development, indicating a strong relationship.

The results of the regression analysis (Table 3) imply that infrastructure investments have a direct and significant impact on regional development, indicating prioritization of these areas. The results support the idea that infrastructure investments can drive regional development and economic growth. The coefficients can inform targeted investments to maximize impact on regional development. Increasing investments in infrastructure, human capital, and institutional quality are likely to yield significant improvements in regional development outcomes in Abia State.

Table 3 indicate a significant positive relationship between infrastructure investment and regional development in Abia State, Nigeria. The coefficient of 0.362 for infrastructure investment (X_1) suggests that a 1% increase in infrastructure investment is associated with a 0.362% increase in regional development, holding other factors constant. This finding is consistent with previous studies that highlighted the importance of infrastructure development in promoting economic growth and regional development (Cash and Antahal, 2021; Ogun, 2010). It is also shown that human capital development (X_2) has a significant positive impact on regional development, with a coefficient of 0.238. This suggests that investing in human capital, such as education and healthcare, can contribute to regional development in Abia State. Institutional quality (X_3) also has a significant positive impact, with a coefficient of 0.145. This shows that improving institutional quality can promote regional development. The R-squared value of 0.75 indicates that the model explains about 75% of the variation in regional development, suggesting a good fit of the model. The F-statistic is also significant at 1%, indicating that the model is statistically significant. Based on the results of the study, policymakers should prioritize these areas in their development plans. The findings of this study corroborate the results of Adeoti (2022) and Ogunrinola (2021), that infrastructure investments are a key driver of regional development, especially investments in roads, electricity, and water supply.

Furthermore, the study's results align with existing literature on the role of infrastructure in promoting economic growth and development (World Bank, 2022; African Development Bank, 2021). The findings also suggest that prioritizing roads and electricity investments can maximize impacts on regional development, consistent with the Abia State Government's focus on infrastructure development (Abia State Government, 2022).

CONCLUSION

The study examined the impacts of infrastructural investments on regional development in Abia State, Nigeria. The results indicate that infrastructure investment, human capital development, and institutional quality have significant positive impacts on regional development. These findings suggest that investing in infrastructure, human capital, and institutional quality can promote regional development in Abia State.

Despite the significance and strength of the study, it has some limitations, which must be acknowledged. The study was limited by relying on secondary data, which may not capture all the relevant variables affecting regional development. It used a simple regression model, which may not capture the complex relationships between infrastructure investment and regional development. The sole focus on Abia State, Nigeria makes the results not generalizable to other states or countries.

It is suggested that to drive regional development, it is pertinent for the government to prioritize infrastructure investments in roads, education, and healthcare, thereby enhancing connectivity, human capital, and access to basic services. The Abia State Government should invest in education and healthcare to improve human capital and promote regional development. The government should also strengthen institutions and improve governance to promote regional development. Public-private partnerships can be harnessed to fund a successful and sustainable infrastructure development mechanism. For maintenance and operations, there is need for adequate funding for infrastructure investments. This can be done by establishing a robust monitoring and evaluation framework to track the progress and impact of infrastructure investments. Therefore, it is highly expected that these recommendations can help Abia State influence infrastructure investments to drive regional development and economic growth.

Future studies should use primary data to capture relevant variables that affect regional development, as well as advanced methodologies, such as panel data analysis or instrumental variable regression to capture the complex relationships between infrastructure investment and regional development. Comparative studies across states or countries are needed to understand how infrastructure investments impact regional development. By addressing these gaps and expanding inquiry in these directions, policymakers can develop a clearer perspective on the effects of such investments and make more informed, evidence-based decisions.

REFERENCES

Abia State Government (2020). Abia State Economic Empowerment and Development Strategy (ABSEEDS).

Abia State Government (2022). Abia State Industrial and Infrastructure Development Plan (ABIIDP).

Abia State Government. (2026). 2026 Budget Speech. Umuahia: Abia

State Government.
Abia State Government (2026). Abia allocates N1.016 trillion for infrastructure development in the 2026 budget.
Adeoti J (2022). Infrastructure development and economic growth in Nigeria. Journal of Economics and Sustainable Development, 13(10): 1-12.
Adeyemi BS and Aigbavboa C (2020). Conflict factors investigation among construction professionals in Nigeria. Resolution Spectrum, the Dispute Resolution Continuum, pp. 123-135.
African Development Bank (2022). Nigeria Infrastructure Report.
African Development Bank (2026). Nigeria: Abia State Infrastructure Project. Abidjan: African Development Bank Group.
Bryman A, Bell E and Harley B (2021). Social Research Methods. Oxford University Press, pp. 1-20.
Cash A and Antahal B (2021). Examining infrastructure-led growth in India: Evidence from state-level analysis. Journal of Infrastructure Development, 13(1): 1-15.
Federal Ministry of Finance, Budget and National Planning (2022). Nigeria's National Development Plan 2021-2025.
Khaki MA and Cash TA (2026). Symmetric and asymmetric impact of infrastructure on economic growth in India. Infrastructure Asset Management, pp. 1-17.
Lucas RE (1988). On the mechanics of economic development. Journal of Monetary Economics, 22(1): 3-42.
North DC (1990). Institutions, institutional change, and economic performance. Cambridge University Press.
Ogun TP (2010). Infrastructure and poverty reduction: Implications for economic growth in Nigeria. Journal of Economics and Sustainable Development, 1(1): 1-12.
Ogunriola A (2021). Spatial analysis of infrastructure and regional development in Nigeria. Journal of Regional Development and Planning, 10(2): 45-60.
Romer PM (1986). Increasing returns and long-run growth. Journal of Political Economy, 94(5): 1002-1037.
Schauer DA (1989). Is public expenditure productive? Journal of Monetary Economics, 23(2):177-200.
Solow RM (1956). A contribution to the theory of economic growth. Quarterly Journal of Economics, 70(1): 65-94.
Swan TW (1956). Economic growth and capital accumulation. Economic Record, 32(2): 334-361.
United Nations Development Programme (UNDP). (2022). Human Development Report 2022: Uncertain Times, Unsettled Lives. New Jersey Publications.
World Bank (2020). Nigeria Infrastructure Development Report. Washington, D.C. World Bank Group.
World Bank (2022). Nigeria economic update: Building a resilient economy.
Yin RK (2021). Case Study Research: Design and Methods. Sage Publications.