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An Empirical Analysis of the Influence of Budgetary Allocation on Rural Development in Rivers State

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Abstract

This study examined the influence of budgetary allocations on rural development in Rivers State, Nigeria, from 1990 to 2025. It specifically analysed the influence of fiscal spending on agriculture, education, and infrastructure regarding rural development. The Autoregressive Distributed Lag (ARDL) model was utilized to assess both long-term and short-term correlations among the variables. The results demonstrated that financial investments in agriculture, education, and infrastructure had positive and statistically significant effects on rural poverty in both the short and long term. Augmented agricultural expenditure facilitated poverty alleviation by enhancing farm output, rural incomes, and employment prospects, while educational financing advanced human capital development and income-generating potential in rural regions. Infrastructure allocation diminished rural poverty by enhancing access to markets, healthcare, and economic prospects. Furthermore, the expansion of deposit money banks was determined to alleviate rural poverty by enhancing financial accessibility and bolstering small-scale rural firms. The research demonstrates that persistent and strategically targeted financial investments are essential for alleviating rural poverty and promoting rural development in Rivers State. The paper recommends synchronized planning of sectoral investments, augmented support for agricultural and educational advancement, and continuous infrastructure investment to enhance livelihoods in rural communities. The study improves comprehension by providing empirical evidence on the dynamic

interactions between sectoral public expenditure and rural poverty, offering insights for policymakers seeking to promote sustainable and inclusive development.

Keywords: Budgetary Allocation, Rural Development, Rural Poverty, Public Expenditure, Autoregressive Distributed Lag (ARDL)

Introduction

Rural development serves as a fundamental component for attaining equitable growth, alleviating poverty, and fostering social cohesion in both emerging and established economies. Rural development is essentially a multifaceted process designed to improve the economic, social, and environmental welfare of inhabitants living in rural regions (Moseley, 2003; World Bank, 2019). It entails the deliberate allocation of resources to enhance livelihoods, expand access to key services, and promote sustainable economic possibilities in communities frequently disenfranchised by geographic, social, and infrastructural limitations. In recent decades, the concept of sustainable rural development (SRD) has gained significance, highlighting not only the economic advancement of rural communities but also the equitable, environmentally aware, and socially inclusive transformation of rural areas (Boggia et al., 2014; Cabannes, 2019). SRD aims to harmonize the enhancement of physical infrastructure and social services with the empowering of communities to engage in decision-making and to manage local resources sustainably.

The historical worldwide discourse on rural development has progressed through various paradigms, mirroring changes in economic theory, social policy, and development practices. Ellis and Biggs (2001) delineate six significant transformations in rural development methodologies since the 1950s, transitioning from solely agricultural modernization to comprehensive rural livelihoods strategies that incorporate infrastructure, education, health, and environmental sustainability. The World Bank (2019) emphasizes that rural development is a strategy aimed at enhancing the economic and social conditions of impoverished rural populations by disseminating the advantages of development to communities reliant on agricultural and natural resource-based livelihoods. This focus on enhancing quality of life and securing sustainable livelihoods constitutes the foundation of modern rural development theory and practice.

The significance of government budgetary allocation in fostering rural development is paramount. Public budgets function as strategic instruments for governments, facilitating resource allocation across sectors, prioritization of developmental goals, and execution of policies that improve social welfare (Musgrave & Musgrave, 1989). Essentially, budgetary allocation converts fiscal capacity into concrete development results, contingent upon the efficient allocation, transparent management, and effective implementation of resources. The

correlation between budget allocation and quantifiable performance outcomes has been extensively documented in industrialized economies. Canada, Sweden, and the United Kingdom utilize performance-based public expenditure frameworks that link financial resources to distinct developmental outcomes in rural health, agriculture, infrastructure, and environmental management (OECD, 2023). These nations illustrate that intentional and focused fiscal allocations can diminish rural–urban inequalities, enhance sustainable livelihoods, and advance social fairness.

Rivers State, situated in the oil-abundant Niger Delta area of Nigeria, serves as a significant case study in this context. The state ranks among the top recipients of federal funding owing to its population density, oil revenue based on derivation, and economic importance. From 2019 to 2024, Rivers State continuously obtained allocations over ₦200 billion each year (BudgIT, 2024). Notwithstanding this significant financial influx, rural communities in the state (specifically Khana, Degema, Emohua, Andoni, and Ahoada) continue to experience underdevelopment, contending with deficient road infrastructure, erratic electricity supply, inadequate water systems, restricted healthcare access, and insufficient educational facilities (Abu, Idris, & Aremu, 2020; NDDC, 2022). This scenario illustrates a policy paradox, whereas Rivers State has the financial capability to support extensive rural development, the conversion of budgetary allocations into substantial enhancements in rural living conditions is still constrained.

Numerous studies ascribe this disjunction to deficiencies in budget formulation, allocation priorities, and execution procedures. Empirical information from Emohua LGA indicates that merely 15.6% of residents have access to paved roads, and only 12.1% benefit from dependable electricity, while banking and healthcare facilities are predominantly unavailable (Abu et al., 2020). Comparable patterns of underdevelopment are evident in Degema and Khana LGAs, indicating that rural infrastructure deficiencies endure despite significant financial inflows. These findings indicate that the content, targeting, and execution of budgetary allocations may be more significant than the total amount of monies distributed.

The concentration of capital projects in urban and semi-urban areas intensifies developmental disparities within Rivers State. Urban locales like Port Harcourt and Obio/Akpor have experienced considerable infrastructural improvements, encompassing water supply initiatives and road restoration, however adjacent rural areas continue to be inadequately served (World Bank, 2021; NBS, 2024). This approach exacerbates rural–urban inequality and promotes rural–urban migration, hence imposing further pressure on urban social infrastructure and diminishing the human capital accessible for rural economic endeavours.

Analyzing budgetary allocations in Rivers State necessitates an examination of fiscal sources, implementation dynamics, and the extent of community involvement in determining development goals. A primary concern is the unequal allocation of development initiatives. Urban and semi-urban areas like Port Harcourt, Obio-Akpor, and Eleme attract

disproportionately greater investments than rural local government areas, intensifying rural-urban gaps and hindering inclusive growth. In riverine regions, environmental vulnerabilities, elevated project execution costs, and restricted transit access exacerbate these issues, hindering rural development despite significant budget allocations.

Between 2010 and the late 2010s, Rivers State's annual budgets exhibited moderate growth, increasing from approximately ₦429 billion in 2010 and fluctuating throughout the decade with figures such as roughly ₦415.9 billion in 2011, ₦438 billion in 2012, and ₦490 billion in 2013, before stabilizing around ₦485 billion in 2014 and 2015, and subsequently declining to ₦307 billion in 2016 under a different fiscal context, indicative of changing priorities and revenue trends. By 2017, the budget had risen to an estimated ₦470 billion, indicating a resurgence in investment in infrastructure and social services. In recent years, the state's fiscal framework has increased considerably: the 2023 authorized budget amounted to around ₦544.7 billion, funded through FAAC allocations, locally produced revenue, and other sources, underscoring persistent development in budgetary magnitude. The 2024 budget was significantly higher, estimated at over ₦800 billion, with a nearly equal distribution between recurrent and capital spending, reflecting enhanced fiscal capability and a heightened emphasis on development projects. In 2025, budget proposals increased significantly, with the Rivers State government submitting figures between approximately ₦1.1 trillion (legally enacted) and ₦1.48 trillion (Senate sanctioned), along with revised estimates reaching ₦1.846 trillion when considering first quarter expenditures.

This indicates a pronounced upward trend in fiscal allocations from 2010 to 2024, demonstrating heightened fiscal aspirations for socioeconomic advancement within the state. Notwithstanding substantial earnings from oil production, internally generated revenue (IGR), and federal appropriations, numerous rural Local Government Areas (LGAs) in Rivers State, specifically Emohua, Degema, Khana, Andoni, and Asari-Toru, persist in facing underdevelopment. Empirical evidence reveals that less than 20% of residents in certain Local Government Areas have access to dependable electricity or paved roads, thereby constraining agricultural output and small-scale economic endeavors (Abu, Idris, & Aremu, 2020).

Notwithstanding Rivers State's robust fiscal status, empirical studies examining the impact of governmental budgetary allocations on rural development results are scarce. Many studies concentrate on aggregate state-level allocations or urban infrastructure initiatives, overlooking the rural setting where developmental needs are frequently most pressing. This study aims to address this deficiency by analyzing the impact of budgetary allocations on rural development in the selected Local Government Areas of Khana, Degema, and Emohua from 2019 to 2025. The research will examine the interplay between allocation patterns, implementation procedures, and local government structures in shaping rural infrastructure, access to social services, and general quality of life. The results of this study are anticipated to offer substantial insights for policymakers, development planners, and local government

officials. This research will elucidate the mechanisms by which fiscal resources contribute to rural development, thereby informing methods for enhancing budget targeting, participatory planning, and fair service delivery. Furthermore, the study enhances overarching theoretical discussions on sustainable rural development, fiscal governance, and the impact of public engagement on improving developmental results.

This research situates the inquiry within global and national contexts of fiscal governance, rural development, and participatory planning, aiming to offer evidence-based recommendations for inclusive and sustainable rural change in the Niger Delta region. This study aims to assess the efficacy of government budgetary allocations in promoting rural development in Rivers State, specifically regarding the kilometre of paved road infrastructure.

Literature Review

Government Budget

Government budgetary allocation denotes the methodical distribution of public financial resources to ministries, departments, agencies, sectors, and regions within a fiscal year to attain economic growth, social welfare, and developmental goals. It functions as the primary financial tool via which governments convert policy priorities into actionable programs and projects (Musgrave & Musgrave, 2004). The World Bank (2018) asserts that budgetary allocation signifies governmental dedication to development by dictating the distribution of limited public resources among competing requirements, including infrastructure, education, health, agriculture, and social protection. From a public finance standpoint, government financial allocation is intricately connected to the allocative, distributive, and stability roles of the state. Musgrave (1959) contends that the allocative function guarantees the supply of public goods and rectification of market failures, whereas the distributive function fosters income equity via targeted social expenditure. The stabilization function promotes macroeconomic stability by countercyclical expenditure and fiscal prudence. These roles influence the prioritization of sectoral and regional spending in national and sub-national budgets by governments.

Government financial allocations are often classified into recurring and capital expenses. Recurrent expenditure encompasses administrative costs, including salaries, wages, and operational expenses, whereas capital expenditure funds long-term investments such as roads, electrical infrastructure, water supply systems, educational institutions, healthcare facilities, and agricultural infrastructure (Bhatia, 2008). Capital spending is crucial for rural development since it immediately facilitates infrastructure provision and enhances productive capacity. Excessive allocation of recurrent expenditures compared to capital investments has been recognized as a significant impediment to developmental results in numerous emerging nations (Iyoha & Oriakhi, 2008). Musgrave (1969) characterizes it as “a declaration of the government's anticipated revenues and expenditures for a specified duration, typically one

fiscal year, embodying the priorities and policy aims of the state. A government budget is a financial document that delineates projected revenues and intended expenditures for a specified timeframe, typically a fiscal year, embodying the government's policy priorities and economic goals.

Rural Development

Rural development denotes the enhancement of economic, social, and physical circumstances in rural communities to elevate living standards, mitigate poverty, and foster sustainable livelihoods. Todaro and Smith (2020) assert that rural development encompasses the enhancement of rural regions via greater access to productive resources, infrastructure, education, healthcare, and employment opportunities. It encompasses agricultural advancement, social inclusion, institutional fortification, and environmental sustainability. The World Bank (2019) describes rural development as a holistic strategy focused on augmenting rural productivity, elevating income levels, expanding service delivery, and mitigating vulnerability among rural communities.

Rural development, from a structural viewpoint, includes enhancements in fundamental infrastructure such as roads, electricity, drinkable water, sanitation, and communication networks, which enable market access and the provision of social services (UNDP, 2020). Chambers (1983) asserts that rural development must be based on individuals, prioritizing the empowerment of rural communities to engage actively in decision-making processes that influence their well-being. This participative method fortifies local ownership of development initiatives and improves sustainability. In developing nations like Nigeria, rural development is intricately associated with agricultural modernization, rural industrialization, and access to financial services, which foster revenue production and employment opportunities (Ellis & Biggs, 2001).

Furthermore, rural development includes a substantial social aspect, integrating improvements in education, healthcare access, housing quality, gender equity, and social security. Sen (1999) asserts that development should be viewed as the augmentation of human potential, suggesting that rural development must enable rural residents to achieve better health, education, and productive livelihoods. This perspective asserts that economic advancement is insufficient unless it leads to enhanced quality of life and reduced inequality. Therefore, rural development initiatives must integrate social welfare objectives with economic transformation strategies.

The World Bank (2003) defines rural development as a strategy to improve the economic and social situations of disadvantaged rural communities, while UNDP (2018) emphasizes the importance of increasing human capacities as a means to achieve sustainable development. Todaro and Smith (2015) regard rural development as crucial to national development, as rural areas often serve as the cornerstone of agricultural output and natural

resource supply. This study assesses rural development via the lens of rural poverty levels in Rivers State, where decreases in rural poverty are viewed as enhancements in rural development results.

Theoretical Literature

Wagner's Law of Increasing State Activity

Wagner's Law of Increasing State Activity was proposed by the German economist Adolph Wagner in 1893. Wagner formulated the hypothesis grounded in his actual observations of public expenditure patterns in industrializing European economies during the late nineteenth century. His principal assertion was that as an economy expands and becomes increasingly intricate, the functions and obligations of the government proliferate, resulting in a persistent rise in public expenditure both in absolute figures and in relation to national revenue (Wagner, 1893). Wagner's Law is a prominent theory in public finance and development economics, extensively utilized to elucidate government expenditure trends in both industrialized and developing nations.

Wagner's Law posits that public expenditure generally escalates in conjunction with increases in national income and economic development. The theory posits that economic expansion inherently generates increased demand for public services, including education, healthcare, infrastructure, security, and social welfare, hence requiring elevated government expenditure. Wagner posits that the extension of state functions arises from modernity, which enhances the complexity of social and economic systems, necessitating government regulation, coordination, and the provision of public goods. Consequently, the expansion of public expenditure is not arbitrary but is fundamentally connected to economic advancement and increasing community demands. In Rivers State, which gets significant oil revenue and federal allocations, Wagner's Law offers a framework for evaluating whether increased budgetary allocations have resulted in substantial rural development. The theory elucidates anticipated expenditure growth trends and enables researchers to investigate anomalies resulting from governance issues, institutional deficiencies, and implementation shortcomings. Consequently, Wagner's Law provides a predictive and evaluative framework for comprehending governmental expenditure patterns and their ramifications for developmental results in Nigeria.

Public Expenditure Theory

The theory of public expenditure was proposed by Swedish economist Erik Lindahl in 1919. This idea posits that the allocation of governmental expenditure and revenue is determined by the manifestation of public preferences. The tax money that the public will contribute will be disclosed by them in accordance with their capabilities. This idea, as posited by Hindrizia and Myles (2005) and Samuelson (1955), assumes that the public sector plays a crucial role in facilitating the efficient operation of economic activity within society. The objectives of

government are often multifaceted and involve multiple stakeholders. Consequently, to prevent disorder, public expenditure should be directed by efficiency and equality.

Hindrizia and Myles (2005) elucidate that efficiency pertains to the seamless operation of public activities. Efficiency pertains to the coordination, collection, and oversight of government revenue and expenditure in relation to service supply for stakeholders. Equity pertains to the equitable distribution of public benefits among stakeholders. This study is grounded in Wagner's law, which posits the principle of escalating public expenditure. Wagner's law was established by Adolph Wagner (1835–1917). The hypothesis posits that public expenditure consistently increases in tandem with income growth in any country. Magazzino, Giolli, and Mele (2015) assert that Wagner's law posits an increasing role of the public sector in GDP with economic progress. The researchers endorse this idea based on the premise that an increase in expenditure correlates with economic growth, which subsequently leads to economic development.

Empirical Literature Review

Budgit (2023) examined state allocations and developmental outcomes by utilizing FAAC allocation data and state-specific service delivery metrics. The survey indicated that North-West states receive substantial allocations but exhibit poor performance in literacy, healthcare, and infrastructure, whereas certain South-East states have superior performance with reduced allocations owing to enhanced fiscal discipline. The report advocated for enhanced efficiency in budget implementation but failed to provide a causal analysis connecting allocations to rural-specific developmental results in each state.

Chukwu and Akani (2022) analyzed budget allocations and rural development in Rivers State, utilizing state budget papers and field surveys to evaluate the effects of budget implementation on rural infrastructure and service delivery. The research revealed that anomalies in implementation such as delays, incomplete project execution, reallocation of funds, inadequate monitoring, and bureaucratic obstacles, diminished the developmental efficacy of budget allocations. The study determined that augmenting monitoring, institutional capability, and procurement processes would improve budget efficacy. It advised the establishment of a comprehensive accountability structure for rural initiatives. Nevertheless, the study did not completely separate indices of rural development, underscoring the necessity for targeted empirical evaluation at the LGA level.

Olaoye et al. (2022) examined the regional distribution of government capital investment in Nigeria, utilizing budget data from the government Ministry of Finance and zonal reports spanning from 2000 to 2020. Their investigation revealed consistent allocation biases that favored the South-West and North-Central regions, resulting in reduced funding levels for the South-East and North-West. The study determined that unequal distribution obstructs rural development in underprivileged areas and advocated for fair allocation of capital projects. The

research was confined to regional analysis, missing insights at the state or local government area level.

Samuel and Oruta (2021) examined government expenditure and economic growth in Nigeria from 1981 to 2020, emphasizing disaggregated expenditures across several sectors. Data were sourced from the Federal Ministry of Finance and the Central Bank of Nigeria statistical bulletins. The study employed econometric techniques, specifically short-run and long-run regression analysis, revealing that in the short term, recurrent spending on agriculture, health, and education exhibited insignificant negative effects, whereas recurrent expenditure on debt servicing and roads demonstrated minimal positive effects. Long-term examination demonstrated that all expenditure components substantially impacted economic growth. The authors determined that the developmental impact of expenditure manifests progressively and advised synchronizing spending priorities with sectoral development objectives. The study, however, did not directly investigate the effects of these spending on rural regions or particular local government results.

Okeke and Emeh (2021) evaluated governmental capital spending and regional infrastructure in the South-East. The study utilized government budget documents and field surveys, employing descriptive and regression methods to evaluate the effects of expenditures. Findings revealed that inconsistent cash disbursements, bureaucratic hindrances, and inadequate project management resulted in ongoing infrastructure deficiencies, particularly in rural areas. The analysis determined that mere allocation does not ensure development and advised enhancing transparency and the effectiveness of project execution. The constraint was the lack of comparative study with other states or an emphasis on rural-specific indicators.

Idris et al. (2020) examined rural development results in North-West Nigeria utilizing data from the National Bureau of Statistics, Niger Delta Development Commission publications, and field surveys. Their findings indicated that rural communities continued to be underdeveloped despite substantial funding, mostly due to ineffective budget management, insufficient control, and inadequate monitoring. The study indicated that the quality of governance, rather than the level of allocation, dictates rural development outcomes, advocating for enhanced institutional supervision. Nevertheless, it was geographically constrained and failed to encompass oil-producing regions such as Rivers.

Nwosu and Ogu (2019) analyzed sectoral budget allocations in Nigeria from 2000 to 2018. The study included regression and trend analysis utilizing federal budget papers and NBS information. It was determined that, despite substantial investments in social and economic sectors, poverty alleviation and job creation were ineffective owing to corruption, misallocation, and project delays. The study advocated for prompt and meticulously organized budget implementation to amplify developmental outcomes. Nevertheless, it did not explicitly concentrate on rural regions or outcomes at the Local Government Area level.

Akpan and Ekpo (2018) analyzed fiscal decentralization and subnational autonomy in Nigeria. The study utilized secondary data from the National Bureau of Statistics and the Ministry of Finance to examine the impact of centralization on the capacity of state and local governments for local development. The results indicated that elevated fiscal centralization diminishes subnational autonomy, constraining local government authorities' capacity to execute rural development initiatives in infrastructure, agriculture, and social services. The study determined that empowering local governments and boosting allocation efficiency is essential for enhancing rural development results, advocating for reforms to bolster fiscal autonomy. However, the study failed to quantify effects at the rural LGA level, resulting in a research gap that the current study seeks to fill.

Kwarteng (2018) analyzed resource allocation by firms in Ghana through the framework of budgetary planning principles. Data were collected via questionnaires distributed to senior executives and budgetary officials of firms listed on the Ghana Stock Exchange. The research utilized structural equation modeling (SEM) using a partial least squares technique (PLS-SEM) to demonstrate a significant relationship between budget planning, performance management, and resource allocation. The findings indicated that performance management somewhat moderated the relationship between budgeting and resource allocation, suggesting that firms allocate resources efficiently in alignment with predetermined budgets. The study concluded that proficient budgetary planning improves resource utilization efficiency. The research recommended the establishment of budget planning frameworks to ensure optimal resource usage in both public and private sectors. The study largely concentrated on corporate resource allocation and did not investigate the impact of budgetary planning on rural development outcomes, namely rural poverty reduction, thus leaving a gap in understanding the significance of public budgetary allocation in mitigating rural poverty.

Okoro (2013) analyzed the relationship between government expenditure and economic growth in Nigeria from 1980 to 2011. The study aimed to examine the impact of recurrent and capital expenditures on GDP growth. The research included time-series data from the Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS), utilizing Ordinary Least Squares (OLS) regression, cointegration, and error-correction modeling methodologies. The results indicated a sustained equilibrium relationship between total government expenditure and GDP growth, with recurrent expenditure having a more significant and persistent impact than capital expenditure. The research established that government spending positively affects economic growth, while its influence is limited by inefficiencies in allocation, particularly at subnational levels. The report recommended enhancing the accuracy and efficiency of public expenditure to achieve more equitable developmental outcomes. However, it could not distinguish the effects of allocation on rural versus urban areas and failed to analyze rural poverty as a metric of rural development, highlighting a shortcoming in understanding the influence of government expenditure on rural poverty alleviation.

Research Methodology

This study used a quantitative, explanatory (causal) research approach to investigate the impact of government budgetary allocations on rural development in Rivers State, Nigeria. The approach is appropriate for determining cause-and-effect links between public expenditure and rural development metrics, including infrastructure provision, access to social services, financial inclusion, and population well-being. A time-series approach spanning 1999–2025 is utilized to analyze both short-term dynamics and long-term trends in budgetary allocations and rural development outcomes. This period signifies Nigeria's democratic age, marked by enhanced fiscal transparency and more uniform budget reporting. This design offers a solid platform for producing empirically based insights to guide public financial management and rural development strategy in Rivers State.

Model Specification

The model used in investigating the econometric relationship between government budget allocation and rural development in Rivers state will build on a modified framework of Jimoh et al. (2020). Jimoh formulated a simple model as presented below:

RDev = f(Gbe)
Where; RDev = rural development
Gbe = government budgeted expenditure.

If rural development is modified and government budgeted expenditure is disaggregated into various components, the functional form of the relationship that will be used in this study is written as:

RPR = f (BAA, BAE, BAI, NDMB_R)
expressed in their logarithm

$$RPR_t = \propto +\beta_1 LOGBAA_t + \beta_2 LOGBAE_t + \beta_3 LOGBAI_t + \beta_4 LOGNDMB\_R_t + \mu t$$

Where;
RPR = Rural Poverty Rate (Proxy for rural development)
BAA = Budgetary allocation to agriculture
BAE = Budgetary allocation to education
BAI = Budgetary allocation to infrastructure
NDMB_R= Number of deposit money banks
β = unknown parameters
β_1- β_4> 0

Decision Rule: accept Ho if P-value > 1% - 5% significant level, otherwise reject Ho.

The Rural Poverty Rate (RPR) denotes the percentage of the rural populace residing beneath the poverty threshold. It indicates the degree of deprivation in rural regions concerning income, consumption, and access to essential services. This study utilizes RPR as a surrogate for rural development; hence, a reduction in rural poverty signifies advancement in rural development. The Rural Poverty Rate (RPR) is often assessed by the percentage of the rural population living below the poverty line.

Estimation Techniques

This study employs the three-stage procedures for econometric analysis. First, the stationarity condition of the series will be established with the unit root procedure. Secondly, the model will be estimated on the basis of the unit root outcome, and finally, we will perform a post-estimation test to ensure that the model is free from the problem of serial correlation and heteroscedasticity.

Data Presentation, Analysis and Discussion of Findings

Table 4.1 Descriptive Statistics

	RPR	BAA	BAE	BAI	NDMB_R
Mean	763.8571	29.73686	46.65229	74.34200	282.9429
Median	550.0000	18.34000	28.00000	45.85000	291.0000
Maximum	2140.000	80.00000	120.0000	200.0000	319.0000
Minimum	120.0000	6.000000	12.00000	15.00000	197.0000
Std. Dev.	610.7976	21.96570	31.11074	54.91405	30.79433
Skewness	0.773273	0.565003	0.628754	0.564992	-1.192207
Kurtosis	2.370701	2.088519	2.238365	2.088480	4.236666
Jarque-Bera	4.065571	3.073744	3.152066	3.073775	10.52155
Probability	0.130970	0.215053	0.206794	0.215049	0.005191
Sum	26735.00	1040.790	1632.830	2601.970	9903.000
Sum Sq. Dev.	12684504	16404.73	32907.85	102528.8	32241.89
Observations	35	35	35	35	35

The descriptive statistics indicate that rural poverty rate (RPR) has a mean of 763.86 and a median of 550.0. The mean above the median indicates a positively skewed distribution. The minimum and maximum values are 120.0 and 2140.0, respectively. The distribution exhibits positive skewness of 0.773, and a kurtosis value of 2.37 signifies a platykurtic distribution, indicating a flatter peak relative to the normal distribution. The Jarque–Bera statistic (4.07) and its associated probability value (0.13) indicate that RPR follows a normal distribution. The budgetary allocation to agriculture (BAA) has a mean of 29.74 and a median of 18.34, indicating minimal disparity between the two measures. The series spans from 6.00 to 80.00.

The distribution is platykurtic, exhibiting a skewness of 0.56 and a kurtosis of 2.09. The Jarque–Bera probability value of 0.22 signifies the normality of the series. The budgetary allocation to education (BAE) has a mean of 46.7 and a median of 28.0, indicating little variability. The values span from 12.0 to 120.0. The distribution exhibits positive skewness of 0.63 and a kurtosis of 2.24, signifying a platykurtic distribution. The Jarque–Bera probability of 0.21 substantiates normality. The budgetary allocation to infrastructure (BAI) has a mean of 74.34 and a median of 45.85, with a range of values from 15.00 to 200.00. The distribution exhibits positive skewness, quantified at 0.56, and is platykurtic, with a kurtosis of 2.08. The Jarque–Bera probability value of 0.22 signifies that the series follows a normal distribution. The mean value of deposit money banks in Rivers State (NDMB_R) is 282.94, while the median is 291.0. This indicates a negative distribution. The minimum and highest values are 197.0 and 319.0, respectively. The skewness of -1.19 indicates a negative skew, suggesting that the left tail is elongated. A kurtosis score of 4.23 indicates a leptokurtic distribution. The Jarque–Bera probability value of 0.00 indicates that the series is non-normally distributed.

Empirical Analysis

Table 4.2 ADF Unit Root Test of the model

S/n	Variables	Level		First difference		Order
		T. Stat	Crit. Value	T. Stat	Crit. Value	
1	BAA	0.230087	-2.951125	-5.450729	-2.957110	I (1)
2	BAE	0.155451	-2.951125	-5.402446	-2.957110	I (1)
3	BAI	0.230044	-2.951125	-5.450475	-2.957110	I (1)
4	NDMB-R	-5.396178	-2.948404	-	-	I (0)
5	PR	2.226537	-2.951125	5.077046	-1.951000	I (1)

Source: *Authors compilation from EViews 10*

Upon comparing the Augmented Dickey-Fuller (ADF) test statistic with the 5% critical value, it is evident that all variables in the model achieved stationarity following initial differencing, with the exception of the number of deposit money banks in Rivers State. This indicates the lack of a unit root in the trend of deposit money banks in Rivers State and the existence of a stagnant trend. This indicates that the variable exhibits consistent behavior and may yield reliable estimations when utilized at this level. Other variables exhibit tendencies of stationarity, since all their ADF test statistics exceed the respective critical values at the 5% significance level in absolute terms. Due to the existence of variables with differing orders of integration in the equation to be estimated, specifically I(1) and I(0), we consequently employ the autoregressive distributed lag (ARDL) modeling approach.

Table 4.2.1 ARDL Bounds Cointegration Test

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	5.525653	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

The limits test operates under the premise that the variables are either I(0) or I(1) series, with the dependent variable being an I(1) variable. The calculated F-statistic is juxtaposed with the non-standard critical limits values as delineated in Pesaran et al. (2001). The lower and upper limits of the critical values presuppose that the regressors are entirely I(0) and I(1), respectively. The F-statistic value of 5.525653 above the threshold value of 4.01 at the 5 percent significance level, indicating a long-run link among the variables in the model. Conversely, we might say that there is a convergence among the economic variables in the model. This validated the estimation of the long-term and short-term coefficients of the cointegrating relationship.

Table 4.2.2 Long Run result of the model

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(BAA)	0.040240	0.018287	-2.200435	0.0381
LOG(BAE)	0.034360	0.016541	-2.077262	0.0491
LOG(BAI)	0.035049	0.016161	-2.168771	0.0407
LOG(NDMB_R)	0.186624	0.076991	2.423979	0.0358
C	-0.157605	0.078090	-2.018258	0.0712

The table above presents the long-term forecast results of the model throughout the study period. The findings indicate that the coefficient of budgetary allocation to agriculture (BAA) is positive and statistically significant at the 5% level. An augmentation in the agricultural sector allocation in Rivers State yields an estimated 4% alteration in rural poverty (RPR) in the long term, assuming all other factors remain constant. This result corresponds with the study's initial hypothesis, as agricultural expansion is closely associated with rural welfare results. Augmented government investment in agriculture frequently bolsters rural development programs, including farm input assistance, rural infrastructure, and agricultural extension services, so enhancing rural production and livelihoods. Thus, enhancements in agricultural financing correlate with a decline in rural poverty over time.

The calculated coefficient for budgetary allocation to education (BAE) is positive and statistically significant. This indicates that an augmentation in funding for the education sector in Rivers State results in an estimated 3% alteration in rural poverty (RPR) over the long run, provided that other variables remain constant. Investment in education encompasses ongoing expenditures, including wages and instructional materials, as well as capital initiatives such as the construction of schools and training facilities. These initiatives augment human capital development in rural regions, enhancing employability, productivity, and income levels. This ultimately enhances rural livelihoods and diminishes rural poverty.

The coefficient of budgetary allocation to infrastructure (BAI) is positive and statistically significant at the 5% threshold. This signifies that an augmentation in infrastructure spending leads to an approximate 4% alteration in rural poverty (RPR) in the long term, all else being equal. A substantial portion of infrastructure expenditure is allocated to transportation systems, encompassing rural roads, bridges, and other amenities. Enhanced infrastructure facilitates market access, diminishes transportation expenses, and fortifies rural economic integration. These impacts facilitate income-generating activities in rural communities, hence contributing to a reduction in rural poverty.

The coefficient for the quantity of deposit money banks (DMBs) in Rivers State is positive and statistically significant at the 5% level. This suggests that an increase in the number of DMBs correlates with an estimated 19% alteration in rural poverty (RPR) in the long term, if other variables are held constant. The proliferation of banking services enhances financial inclusion by augmenting access to credit, savings, and financial services in rural regions. This improves investment prospects for rural households and small enterprises, bolsters agricultural and non-agricultural endeavors, and ultimately aids in diminishing rural poverty.

Table 4.2.3 Short run result
Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(PR(-1))	0.395037	0.175214	2.254588	0.0336
DLOG(PR(-2))	0.319243	0.189217	1.687177	0.1045
DLOG(BAA)	0.055550	0.017237	-3.222767	0.0104
DLOG(BAE)	0.184978	0.075053	2.464636	0.0359
DLOG(BAI)	0.036876	0.016572	-2.225185	0.0362
DLOG(NDMB_R)	0.028891	0.014229	-2.030493	0.0435
CointEq(-1)	-0.092428	0.007234	-2.118029	0.0487

R-squared	0.899902	Mean dependent var	6.364815
Adjusted R-squared	0.799880	S.D. dependent var	0.859179
S.E. of regression	0.009418	Akaike info criterion	-6.306602
Sum squared resid	0.002306	Schwarz criterion	-5.989161
Log likelihood	111.0589	Hannan-Quinn criter.	-6.199793
F-statistic	44383.95	Durbin-Watson stat	2.423175
Prob(F-statistic)	0.000000		

***Note:** p-values and any subsequent tests do not account for model selection.

The coefficient of determination (R^2) is 0.8999, signifying a robust goodness of fit, while the corrected R^2 is 0.7998. This indicates that roughly 80% of the variance in rural poverty (RPR) is elucidated by the explanatory variables in the model, whilst the remaining 20% is ascribed to factors represented by the error term. The Durbin–Watson value of 2.4 indicates a lack of significant serial correlation in the residuals, suggesting that autocorrelation is not a substantial issue in the model.

The econometric findings indicate that the error correction term (ECT), which quantifies the rate of adjustment from short-term aberrations to long-term equilibrium, exhibits the anticipated negative sign and is statistically significant at the 5% level. This affirms the presence of a stable long-term link among the variables and suggests that deviations from equilibrium are progressively rectified over time. The coefficient of −0.09 indicates that roughly 9% of the prior period's disequilibrium in rural poverty (RPR) is rectified in the present period, signifying a moderate yet stable adjustment process.

Short-run estimations indicate that the one-period lag of rural poverty (RPR(-1)) is positive and statistically significant, demonstrating the persistence of rural poverty conditions. This indicates that alterations in rural poverty often persist into future eras, mirroring structural and institutional inflexibilities such as income limitations, restricted work prospects, and sluggish policy implementation effects in rural regions. The two-period lag of rural poverty

(RPR(-2)) is positive yet statistically insignificant, indicating that the impact of prior poor conditions diminishes with time due to policy modifications, welfare initiatives, or evolving economic circumstances.

The coefficient of budgetary allocation to agriculture (BAA) is positive and statistically significant at the 5% significance level. An increase in agricultural expenditure results in an approximate 5% decrease in rural poverty (RPR) in the short term, assuming all other factors remain constant. Given that agriculture is the primary source of livelihood in rural Rivers State, augmented funding boosts production via enhanced inputs, extension services, and rural infrastructure, consequently fortifying household incomes and diminishing poverty rates.

The calculated coefficient for budgetary allocation to education (BAE) is positive and statistically significant at the 5% threshold. This indicates that a rise in educational spending results in an estimated 18% alteration in rural poverty (RPR) in the short term. Augmented investment in education fosters human capital development in rural communities, enhancing skills, employability, and long-term earning potential. While the effect may first indicate heightened access and participation expenses, it ultimately fosters poverty alleviation by enhancing economic prospects.

The coefficient of budgetary allocation to infrastructure (BAI) is positive and statistically significant at the 5% threshold. This suggests that a rise in infrastructure spending results in an estimated 4% decrease in rural poverty (RPR) in the short term, all else being equal. Infrastructure development (particularly in roads, electricity, and water systems) enhances rural connectivity, diminishes transaction costs, and broadens access to markets and services, consequently improving rural welfare and alleviating poverty levels.

The coefficient for the number of deposit money banks (DMBs) in Rivers State is positive and statistically significant at the 5% level. This indicates that a rise in the number of banks correlates with an estimated 3% decrease in rural poverty (RPR) in the short run. The proliferation of banking services enhances financial inclusion by augmenting access to credit, savings options, and investment prospects, so bolstering rural economic endeavors and facilitating poverty reduction.

Post Estimation Tests

i. Serial Correlation Test

Table 4.3: Breusch-Godfrey Serial Correlation LM Test

F-statistic	2.575615	Prob. F(2,22)	0.0988
Obs*R-squared	2.071157	Prob. Chi-Square(2)	0.0780

We utilized the Breusch-Godfrey Serial Correlation LM Test to assess the serial independent of the error term. The F-statistic value of 2.575615 and the observed R-square value of 2.071157 are statistically insignificant, with probability values of 0.0988 and 0.0780, respectively. Therefore, we conclude that there is no evidence of serial correlation in the study's residuals, and the estimated equation is BLUE.

Table 4.3.1: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.074951	Prob. F(6,25)	0.0934
Obs*R-squared	2.193074	Prob. Chi-Square(6)	0.0952
Scaled explained SS	1.306799	Prob. Chi-Square(6)	0.0820

To assess the equality of the residual variance, as stipulated by the fundamental classical least squares assumption, we utilized the Heteroskedasticity Test: Breusch-Pagan-Godfrey. This test is the converse of the homoskedasticity test and is employed to verify the validity of the classical least squares assumptions. The F statistic is 1.074951, the Obs*R-squared is 2.193074, and the Scaled explained SS is 1.306799, with corresponding probability values of 0.0934, 0.0952, and 0.0820. Therefore, we ascertain that there is evidence of homoskedasticity in the residuals, and we conclude that the estimated equation is BLUE.

Discussion of Findings

The empirical evidence indicates that budgetary allocation to agriculture (BAA) positively and significantly affects rural poverty (RPR) in both the long and short term at the 5% significance level. This signifies that enhancements in agricultural sector finance during the study period significantly aided in alleviating rural poverty in Rivers State. This result corresponds with the study's a priori expectations and underscores the robust connection between agricultural investment and the enhancement of rural welfare. In Rivers State, numerous agricultural initiatives, including agro-processing zones, irrigation projects, and farm settlement schemes, significantly improve rural livelihoods by enhancing production, income creation, and employment prospects. Thus, augmented agricultural expenditure alleviates rural poverty by facilitating access to productive resources, enhancing market integration, and stimulating rural economic activity.

The projected findings suggest that financial allocation to education exerts a positive and statistically significant effect on rural poverty (RPR) in both the long term and short term at the 5% significance threshold. This indicates that augmentations in education sector expenditure during the study period substantially aided in the alleviation of rural poverty, ceteris paribus. Augmented educational investment enhances rural human capital development,

consequently elevating employability, income potential, and long-term socioeconomic mobility. Public expenditure on education encompasses recurrent costs, including personnel and instructional materials, as well as capital investments for the building and expansion of educational institutions. These initiatives enhance human capital development in rural communities, hence facilitating enduring poverty alleviation over time.

The projected findings indicate that budgetary allocation to infrastructure exerts a positive and statistically significant effect on rural poverty (RPR) in both the long run and short run at the 5% significance level. This indicates that heightened infrastructure spending during the research period markedly alleviated rural poverty in Rivers State. A significant share of infrastructure expenditure is allocated to transportation systems, encompassing road building, rehabilitation, and enhancement. Enhanced infrastructure increases rural accessibility, reduces transportation and transaction expenses, and promotes increased engagement in economic activities. Consequently, enhanced infrastructure investment is vital in elevating rural livelihoods and diminishing poverty rates.

The study demonstrates that budgetary investment to infrastructure substantially decreases rural poverty (RPR) in Rivers State during the study period. This study aligns with Alex (2019), who also identified a robust correlation between public infrastructure expenditure and enhanced socioeconomic outcomes, notably for rural development and welfare improvement.

Summary

This study examined the influence of budgetary allocations on rural poverty (RPR) in Rivers State from 1990 to 2025 using the ARDL modeling technique. The empirical findings revealed both short-term and long-term links between public sector expenditure and rural poverty patterns in the state. Budgetary allocation to agriculture demonstrated a positive and statistically significant effect on rural poverty in both the short and long term. This indicates that augmented agricultural funding significantly aided in diminishing rural poverty by improving rural livelihoods through enhanced production, revenue creation, and access to agricultural services, thereby fortifying rural economic integration. Likewise, financial allocation to education exerted a beneficial and considerable impact on rural poverty (RPR) in Rivers State. Augmented investment in educational infrastructure and services fosters human capital development, hence improving employment, income prospects, and long-term socioeconomic mobility in rural regions. This, consequently, is crucial in alleviating rural poverty. Furthermore, financial allocation for infrastructure demonstrated a positive and statistically significant effect on the alleviation of rural poverty. This affirms that continuous public investment in infrastructure enhances access to markets, services, and economic opportunities, thus diminishing poverty levels in rural regions.

Conclusions

This study shows that budgetary allocations are crucial and impactful in alleviating rural poverty (RPR) in Rivers State. Empirical evidence from both short-term and long-term evaluations demonstrates that heightened public investment in agriculture, education, and infrastructure substantially aids in alleviating rural poverty. These data highlight the interdependent relationship between public sector expenditure and enhancements in rural welfare outcomes. The research illustrates that persistent and well-organized public investment is essential for attaining enduring reductions in rural poverty, fostering inclusive growth, narrowing rural-urban gaps, and enhancing overall living standards in Rivers State.

Recommendations for Policy

Given the substantial beneficial effect of agricultural budget allocation on alleviating rural poverty, the Rivers State Government ought to augment and prioritize agricultural spending aimed at enhancing rural livelihoods. Budget appropriations for agriculture must encompass specific support for farm-to-market highways, feeder road networks, irrigation systems, and agro-logistics infrastructure. This will augment market access, diminish post-harvest losses, raise agricultural production, and expedite rural poverty alleviation outcomes.

Given the favorable correlation between support for the education sector and the alleviation of rural poverty, the government ought to implement a comprehensive development strategy that ties the construction of educational infrastructure with overarching rural development objectives. The creation of schools, technical institutions, and training facilities in rural and peri-urban regions must be supported by sufficient social and transportation infrastructure to guarantee accessibility, increase enrollment, and improve educational results. This would enhance human capital development and aid in the persistent decrease of rural poverty.

Considering the substantial impact of infrastructure investment on alleviating rural poverty, the Rivers State Government ought to maintain and enhance infrastructure funding, especially for rural roads, transit systems, and essential utilities. Emphasis must be placed on rural-urban connection routes, agricultural corridors, and economically sustainable rural communities. The use of multi-year capital budgeting and improved project monitoring frameworks would increase efficiency, decrease project abandonment, and guarantee that infrastructure expenditures yield quantifiable poverty reduction results.

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