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Road Network, Agriculture and the Economy of Benue and Kogi State

Nathan Udoinyang
Department of Economics, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Rivers State Nigeria

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Abstract. This research looks at road network, agriculture and the economy of Benue and Kogi State. The research used both primary and secondary data to compile its population. A sample size of 400 was achieved by using Taro Yamane formula. With the use of a purposive sampling methodology, 400 questionnaires were circulated and 286 were collected. Using a mean criterion of 3.0, the questionnaire was evaluated using a 5-point Likert scale, SPSS and Cronbach Alpha correlation of 0.80 was employed in it data analysis. According to the research, decreased in agricultural productivity, increased post-harvest losses, limited access to markets, high transportation costs, decrease in crop quality, decrease in economic growth, increased in poverty, decrease in investment, increased in food prices, reduction in government revenue, environmental degradation, reduction to access to social services, increased accidents and fatalities, reduction in the quality of life and hindrance to sustainable development are the result of bad road network in Benue and Kogi State. The study gave some recommendations and concluded that the availability of good road transport infrastructure will improve agricultural output and the economy of Benue and Kogi State.

Key words: Agricultural Productivity, Economic Growth, Economic Development, Road Network

Introduction

Benue State and Kogi State is one of the 36 states in Nigeria, located in the North-Central region of the country. The states have a total land area of approximately 30,955 square kilometers and a population of over 4.2 million people (National Population Commission, 2020). Benue State is known for its rich agricultural land and is often referred to as the "Food Basket of the Nation" (Benue State Government, 2020) while Kogi State's economy is a mixed bag, driven primarily by agriculture, solid minerals, and the services sector with agriculture the largest contributor accounting for roughly 30% of the state's Gross State Product (GSP), with about 70% of the population employed in agricultural activities. Both states road network plays a crucial role in facilitating trade and commerce. Benue and Kogi's strategic location at the center of Nigeria connects it to major trade routes, with key highways like the Otukpo-Makurdi-Abuja road, Lokoja-Abuja Road facilitating transport between northern and southern regions. The Lokoja River Port also enhances riverine transport along the Niger, connecting to other ports and making it easier to move goods across Nigeria. To enhance rural access and agricultural marketing, the Benue and Kogi State Rural Access and Agricultural Marketing Project (RAAMP) aims to provide sustainable road networks, uplift smallholding farmers, and micro agro-processors, improving their livelihoods. The states government has also approved a comprehensive rehabilitation and reconstruction plan for several rural access roads to improve transportation infrastructure, enhance agricultural productivity, and boost socio-economic development. The road network in Benue and Kogi State plays a critical role in the state's economy, particularly in the transportation of agricultural produce from rural areas to urban markets (Adegbite et al., 2019). The state has a total road network of approximately 6,000 kilometers, with about 70% of the roads in good condition (Federal Ministry of Works and Housing, 2020). Agriculture is the mainstay of the economy of Benue and Kogi State, providing employment and income for over 70% of the state's population (National Bureau of Statistics, 2020). Benue state is a major producer of staple crops such as rice, maize, and cassava, as well as cash crops such as soybeans and sesame (Benue State Government, 2020) while Kogi State produce crops like cassava, rice, yam, and maize with cassava alone contributes approximately 16% of Nigeria's total, with over 3.3 million tons produced in 2022. Despite the importance of agriculture to both state economy, Benue and Kogi State faces significant challenges in the sector. The state's agricultural productivity is low due to inadequate infrastructure, limited access to credit and markets, and inadequate extension services (Adegbite et al., 2019). Additionally, the state's road network is inadequate, leading to high transportation costs and losses of agricultural produce (Federal Ministry of Works and Housing, 2020). The problems facing the agricultural sector in Benue and Kogi State are further compounded by the state's rapid population growth, which has led to increased pressure on the state's infrastructure, resources, and services. The state's population is projected to continue growing, with significant implications for the state's economy, infrastructure, and natural resources. Benue and Kogi State are facing similar problems which are multifaceted and interconnected as a result of inadequate road network, leading to other economic problems in the state. These problems have significant implications for the state's economy, infrastructure, and natural resources, and require urgent attention from policymakers and stakeholders. Therefore, this research tends to investigate the impact of bad road network on agriculture and the economy of Benue and Kogi State as well as providing solutions for government and policy makers in both states.

Conceptual Clarifications

The conceptual framework for this study is as follows:
Road Network → Agricultural Productivity → Economic Growth and Development
This framework suggests that the development of road networks can lead to increased agricultural productivity, which in turn can lead to increased economic growth and development.

Road Network

Road network refers to the system of roads and highways that connect different parts of a region or country. It is a critical component of transportation infrastructure that facilitates the movement of people, goods, and services (Federal Ministry of Works and Housing, 2020). In this study, road network is considered as an independent variable that affects agricultural productivity.

Agricultural Productivity

Agricultural productivity refers to the output of agricultural production per unit of input, such as land, labor, or capital. It is a measure of the efficiency of agricultural production and is influenced by factors such as technology, irrigation, and fertilizer use (Food and Agriculture Organization, 2017). In this study, agricultural productivity is considered as the dependent variable that is affected by population growth and road network.

The Economy

The economy may be defined as the way by which people of a particular city, state, region and country organize themselves and their resources to produce goods and services which they need (Udoinyang, 2025). In this study, the economy is considered as the dependent variable that is affected by population growth and road network.

Economic Growth

Economic growth refers to the increase in the production of the quantity of goods and services in an economy over a period of time. It is typically measured by the percentage change in the Gross Domestic Product (GDP) or Gross National Product (GNP).

Economic Development

Economic development, on the other hand, refers to the process of improving the standard of living, quality of life, and economic well-being of a country or region. It encompasses not only economic growth but also social, political, and institutional development.

Theoretical Framework

The theoretical framework for this study is based on the concept of economic growth and development, which is influenced by factors such as infrastructure development, agricultural productivity, and institutional factors.

Infrastructure Development Theory

The infrastructure development theory posits that the development of infrastructure such as roads, bridges, and highways is essential for economic growth and development (Aschauer, 1989).

This theory suggests that investment in infrastructure development can lead to increased economic productivity, reduced transportation costs, and improved access to markets.

Agricultural Productivity Theory

The agricultural productivity theory po2sits that agricultural productivity is influenced by factors such as technology, irrigation, and fertilizer use (Hayami & Ruttan, 1971). This theory suggests that increased agricultural productivity can lead to increased economic growth, reduced poverty, and improved food security.

New Growth Theory

The new growth theory posits that economic growth and development are influenced by factors such as human capital, institutional factors, and technological progress (Romer, 1990). This theory suggests that investment in human capital, institutional development, and technological progress can lead to increased economic growth and development.

Empirical Literature

Udoinyang (2024) examines the economic impact of poor road network on the agricultural value chain in Rivers State. This study used survey methodology to collect data from the entire population of Rivers State. A total of 355 people from the three senatorial districts completed the survey, and the researcher used Taro Yamane's formula to determine that a sample size of 400 was adequate. With a mean score of 3.0, the Statistical Package for Social Sciences (SPSS) was used to analyze the research themes of the study. The review of the findings on the economic impact of poor road network on the agricultural value chain in Rivers State is as follows: damage to perishable goods, due to long hours of transportation of goods from farm to market, etc. The study concluded that a good road network is one of the factors in achieving food self-sufficiency in Rivers State and recommended that the state government should assist farmers in transporting their agricultural produce to the urban market, where it is sold at a premium price, by providing vehicles, by creating a good road network that connects, among other things, farmlands with the modern market in the urban areas of the state.

Utuk et al (2024) reviewed the contribution of road transport infrastructure to agricultural production. The study used a quantitative approach, collecting data from 300 farmers in Nigeria. The data were analyzed using descriptive statistics and regression analysis. The study found that the quality of road transport infrastructure has a significant impact on agricultural production in Nigeria. The study concludes that investment in road transport infrastructure can improve agricultural production and productivity in Nigeria and recommends that policymakers prioritize investment in road transport infrastructure to support agricultural development in Nigeria.

Novosad (2022) investigate rural roads and local economic development. The study used a quantitative approach, analyzing data from rural road construction projects in India. The study found that rural road construction has a positive impact on local economic development, increasing access to markets and employment opportunities. The study concludes that investing in rural roads can be an effective way to promote local economic development and went further to recommend that policymakers prioritize investing in rural roads, particularly in areas with high levels of poverty and limited access to markets.

Abdo et al (2021) examine the impact of improved road networks on vegetable marketing and

household income in Dedo District, Oromia Regional State, Ethiopia. Two kebeles were selected for the study and data were collected from 176 randomly selected households in two kebeles of the district. In addition, key informant interviews and focus group discussions were also conducted. The data were analyzed using multiple response tests and multiple linear regression models in the Statistical Package for Social Sciences (SPSS). The study found that out of the total annual household income, 58.5% of the income was generated from vegetable production and it constituted a significant portion of the annual household income in the study area. The regression results revealed that the independent study variables had a negligible impact on the annual income of rural households ($p < 0.05$). The multiple correlation coefficient measurement ($R = 0.845$) also showed that the relationship between the annual income of rural households and the independent variables (set of explanatory variables) was highly correlated. The results also showed that high transportation costs, product deterioration, lack of expansion, service and market information, and reduction in household income are among the main impacts of road infrastructure in the district. Therefore, the study suggested that rural households should be provided with access to roads and federal and local road authorities should pay attention to the development of road infrastructure in rural areas.

Abdulrahim et al. (2021) examines the impact of transport on agricultural practice and production in rural areas: implications for sustainable food security. The survey method used is a questionnaire designed for farmers. Emphasis was placed on the causes and effects of the poor road network caused by lack of road maintenance insurance, flooding during the rainy season resulting in high cost of transportation from farm to market and therefore reduces farmers' income and the quality of their products. of the products available in the markets. From the data collected, several effects were identified that work against efficient and productive agricultural practice in the study area. However, some recommendations have been made to help solve the problems.

Oluwatoyin & Abolade (2021) investigate the Effects of Road Infrastructure on Plantain Production among Farmers in Ekiti Southwest Local Government Area of Ekiti State, Nigeria. Multistage sampling procedure was used to select 103 respondents for the study; data were collected using structured interview schedule. Data on respondents' personal characteristics, perceived contribution of road infrastructure to plantain enterprise and constraints to plantain production and marketing were analysed with descriptive statistics, Chisquare and Pearson Product Moment Correlation statistical tools. Majority (75.7%) of the respondents were males, large percent (70.8%) were ageing (50-70years), 71.8% cultivated 4-6 acres with a majority (79.6%) having more than 20years of farming and marketing experience. Almost half (47.6%) of the respondents earned between #31,000-#40,000 monthly and majority (78.6%) indicated that their farms to the market were far and not motor able. About (65%) indicated that poor road infrastructure had negative implication on production and marketing of plantain. Educational level ($\chi2=14.13$), farm size ($\chi2=0.932$), monthly income ($\chi2=7.938$), farming experience ($\chi2=11.831$), marketing experience ($\chi2=10.609$), farmers age ($r = -0.375$) and constraints to production and marketing ($r = 0.261$) were significantly related to effects of road infrastructure on plantain production. Hence, it is recommended that government should ensure quality rural feeder roads linking urban areas for sustainable farming practices, reduction of postharvest losses and efficient plantain marketing.

From the empirical literature above, none of the study looks at the impact of bad road network on agriculture and economy in one study nor any of the study above was carried out using Benue State or Kogi State as a case study. Base on this, the researchers tend to carry out this study in other to

investigate the impact of bad road network on agriculture and the economy of Benue and Kogi State as well as providing solutions for government and policy makers in both states.

Methods

This study adopt survey study designed to examine road network, agriculture and the economy of Benue and Kogi State. Primary data and secondary data were used in this study. The population for this study includes some selected local government area in Benue State (Otukpo, Makurdi, Kastina-Ala) and Kogi State (Idah, Okene, Lokoja). The total population of the study consist of the entire population of Benue (4,253,641 as of census 2006 and was estimated by NBS as 6,141,300 in 2022) and Kogi State (3,314,043 as of census 2006 and was estimated by NBS as 4,466,800 in 2022). With the implementation of Taro Yamane, the population size was reduced to 400 sample size and were divided equally to each of the six (6) LGAs and sixty-six (66) people were selected each from four (4) LGA while sixty-eight (68) were selected from both State capital (Makurdi and Lokoja). It allows researchers to access important information for the research. Data are presented using descriptive tools such as percentages, mean and standard deviation. The research questions were analysed using 5 Linkert scale, mean and standard deviation in Social Sciences Statistical Software (SPSS). The research questions were analysed using an average score of 3.0; Total scores below 3.0 indicate that the participant disagrees with the research question, while total scores above 3.0 indicate that the participant agrees with the research question. This study chose to use purposive sampling because it provides a non-probability sample based on a specific population and characteristics common to all studies. It also helps the researchers identify stereotypes that exist in each group. Based on purposive sampling technique, one local governments were selected from each of the three (3) senatorial district in both state making it a total of six (6) local governments selected for the study and they are as follows: Otukpo, Makurdi, Kastina-Ala, Idah, Okene and Lokoja. The distribution of LGA's and their selection criteria are as follows:

Table 1. Sectorial Distributions of the Questionnaires

Senatorial District	Names.of L.G.A	No. of L.G.A Selected	Names of Selected L.G.A	No. of Questionnaires Distributed and No. Returned
Benue South	Ado Agatu Apa Obi Ogbadibo Ohimini Oju Okpokwu Otukpo	1	Otukpo	66/53
Benue North/West	Buruku Gboko Tarka Guma Makurdi Gwer East Gwer West	1	Makurdi	68/50

Benue North/East	Katsina-Ala Logo Ukum Konshisha Vandeikya Kwande Ushongo	1	Kastina-Ala	66/41
Kogi East	Ankpa Bassa Dekina Ibaji Idah Igalamela-Odolu Ofu Olamaboro	1	Idah	66/47
Kogi Central	Adavi Ajaokuta Ogori/Magongo Okehi Okene	1	Okene	66/43
Kogi West	Kabba/Bunu Kogi Lokoja Mopa-Muro Yagba East Yagba West	1	Lokoja	68/52
				400/286

Source: author's compilation (2025)

Presentation of data

The data analysis is based on research objectives. Primary and secondary data were reviewed. In the main analyses, participants were identified according to demographic characteristics. Age, gender, marital status and all other demographic variables are calculated as percentages. In secondary analysis we use standard deviations and mean for descriptive statistics.

Table 2. Sociodemographic characteristics of Respondents

Sociodemographic Characteristics	**Frequency**	**Percent**
Sex		
Male	155	54.2
Female	131	45.8
Total	286	100

Marital Status		
Unmarried	75	26.2
Married	111	73.8
Total	286	100
Age Grade		
30-40 years	94	32.9
41-50 years	73	25.5
51- 60 years	65	22.7
61 years and above	54	18.9
Total	286	100
Educational Qualification		
FSLC/WAEC	83	29.0
NCE/ND	67	23.4
HND/BSC	104	36.4
MSC/PHD	32	11.2
Total	286	100
Occupation		
Traders	61	21.3
Farmers	93	32.5
Transporters	57	19.9
Business men/women	40	14.0
Economist	35	12.2
Total	286	100
Total	286	100

Source: Authors Survey Compilation 2025.

Table 2 showed detail information of the population. Out of the 286 respondents, majority of them are married constituting a total of 73.8% of the total. In sex distribution, 131 are females (45.8% of the total) and 155 males (54.2% of the total). In terms of age grade, most respondents fall within 30-40 years of age; Similarly, when asked about their educational qualification among the 286 respondents, the highest respondents have HND/BSC 104 (36.4%) and the lowest respondents are Economist when it comes to occupation.

Data Analysis

In order to validate the research questions, the data of this study are presented and analyzed below using standard deviation, SPSS software and Cronbach Alpha correlation coefficient of 0.80.

Research Question

What are the impact of bad road network on agriculture and the economy of Benue and Kogi State?

Table 3. Participants' views on the impact of bad road network on agriculture and the economy of Benue and Kogi State

No.	Reports	Mean	Standard Deviation	Decision
	Impacts on Agriculture			
1	Poor road network hinders the transportation of agricultural inputs and outputs, leading to reduced productivity in Benue and Kogi State.	**3.80**	**3.57**	**Very Good**
2	Bad roads cause delays in transporting agricultural produce to markets, resulting in increased post-harvest losses in both Benue and Kogi State.	**4.21**	**3.65**	**Very Good**
3	Poor road network limits farmers' access to markets, making it difficult to sell their produce.	**3.50**	**3.27**	**Very Good**
4	Bad roads increase transportation costs, reducing farmers' profit margins.	**3.39**	**3.29**	**Very Good**
5	Poor road network causes delays in transporting perishable crops thereby reducing crop quality in both Benue and Kogi State.	**3.96**	**3.64**	**Very Good**
	Impacts on the Economy			
6	Poor road network hinders economic growth by limiting access to markets, increasing transportation costs, and reducing agricultural productivity as this hinder economic growth and development in Benue and Kogi State.	**3.72**	**3.44**	**Very Good**
7	Bad roads perpetuate poverty by limiting access to markets, reducing agricultural productivity, and increasing transportation costs in both state.	**3.39**	**3.58**	**Very Good**
8	Poor road network discourages investment in agriculture and other sectors, thereby hindering economic growth and development.	**4.06**	**3.67**	**Very Good**
9	Bad roads cause delays in transporting food, leading to increased food prices and food insecurity in Benue and Kogi State.	**4.46**	**4.01**	**Very Good**
10	Poor road network reduces government revenue by limiting agricultural productivity, reducing economic growth, and increasing poverty.	**4.16**	**3.83**	**Very Good**
	Impacts on Both Agriculture and the Economy			
11	Poor road network causes environmental degradation by increasing soil erosion, landslides, and water pollution in Benue and Kogi State.	**3.98**	**3.58**	**Very Good**
12	Bad roads limit access to social services, such as healthcare and education, hindering human development in both State.	**3.87**	**3.50**	**Very Good**
13	Poor road network causes accidents and fatalities, reducing the quality of life and increasing healthcare costs in Benue and Kogi State.	**3.93**	**3.65**	**Very Good**
14	Bad roads reduce the quality of life by increasing travel time, reducing access to markets and social services, and increasing poverty among residents in both State.	**4.02**	**3.66**	**Very Good**
15				

	Poor road network hinders sustainable development by limiting access to markets, reducing agricultural productivity, and increasing poverty, making it difficult to achieve the Sustainable Development Goals (SDGs).	**3.78**	**3.46**	**Very Good**
	Average Total	**3.88**	**3.59**	**Very Good**

Source: Author's survey, 2025.

In Table 3 (1-15), the table aims to discuss the impact of road network on agriculture and the economy of Benue and Kogi State. As shown in the table above, the aggregate mean is above the mean criterion of 3.0. Additionally, based on all responses, the standard deviation is 3.59 and the average mean is 3.88. According to the findings, the respondents anonymous agreed that bad road network have a negative significant impact on agriculture and the economy of Benue and Kogi State.

Results and Discussion

Responses to the research questions revealed the impact of road network on agriculture and the economy of Benue and Kogi State. Agriculture as well as the economy of Benue and Kogi State have all experience decreased in agricultural productivity, increased post-harvest losses, limited access to markets, high transportation costs, decrease in crop quality, decrease in economic growth, increased in poverty, decrease in investment, increased in food prices, reduction in government revenue, environmental degradation, reduction to access to social services, increased accidents and fatalities, reduction in the quality of life and hindrance to sustainable development as a result of bad road network in Benue and Kogi State as seen in table 3. The result of this study is in line with the findings of Oluwatoyin & Abolade (2021), Abdulraheem et al (2021), Abdo et al (2021) and Udoinyang (2024) that bad road network has negative impact on production and marketing of crops, lead to high cost of transportation, reduce farmers and household revenue/income, reduce the quality of goods available in the market, deprive extension, lead to spoilage of agricultural product, damage perishable goods and also reduce the price of goods. The study is also in support of that of Novosad (2022) and Utuk et al (2024) that the availability of good road transport infrastructure will improve agricultural output. Consequently, through the findings of the research question and the associated empirical literatures evidence, this study has been able to reviewed the impact of bad road network on agriculture and the economy of Benue and Kogi State which is the objective of the study.

Conclusion

This study has examined the relationship between road network, agriculture and the economy of Benue and Kogi State, with a focus on the impact of road network on agriculture and the economy of Benue and Kogi State. The study has found that bad road network has had a negative significant impact on agricultural productivity, post-harvest, markets, transportation costs, crop quality, economic growth, investment, food prices, government revenue, environment, social services, quality of life and sustainable development.

Recommendations

The study recommended that:

1. the government of Benue and Kogi State should prioritize investing in road infrastructure, including the construction and maintenance of rural roads, to improve access to markets and social services.
2. the government of Benue and Kogi State should implement road maintenance programs to ensure that roads are properly maintained and rehabilitated.
3. the government of Benue and Kogi State should promote private sector participation in road construction and maintenance to increase investment and efficiency.
4. the government of Benue and Kogi State should develop alternative transportation modes, such as rail and water transportation, to reduce dependence on roads and improve access to markets.
5. the government of Benue and Kogi State should implement programs to improve agricultural productivity, including the provision of extension services, inputs, and credit facilities.
6. the government of Benue and Kogi State should enhance access to markets by providing market infrastructure, including storage facilities, and promoting market information systems.
7. the government of Benue and Kogi State should implement programs to reduce poverty and inequality, including social protection programs and poverty reduction initiatives.
8. the government of Benue Kogi State should implement programs to protect the environment, including reforestation programs and conservation initiatives.

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