ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 2, ISSUE 3, 2025

RESEARCH ARTICLE

EFFECTS OF ROAD TRANSPORT INFRASTRUCTURE ON AGRICULTURAL PRODUCTIVITY ON MARKET ACCESS IN KURA KANO STATE, NIGERIA

[1]Abdullahi Shuaibu Abubakar, [2]Aliyu Shuaibu Muhammad, [3]Idris Lawan, [4]Umar Farouk Yahaya, [5]Muhammad Bello Shuaibu

[1] Registry Department, Federal University Gashua, Yobe State, Nigeria; [2]Department of Geography, Yusuf Maitama Sule Federal University of Education, Kano State; [3]Department of Geography, Northwest University, Kano; [4] Geography Department, Aliko Dangote University of Science & Technology Wudil, Kano; [5]Department of Geography, Aminu Kano College of Legal and Islamic Studies, Kano.

ABSTRACT

This study examined the impact of road transport infrastructure on agricultural productivity and market access in Kura Local Government Area of Kano State. Specifically, the study sought to: assess the effect of road transport infrastructure on agricultural productivity in Kura; and to identify strategies for improving road infrastructure to enhance agricultural productivity and market access. A descriptive survey design was employed, with a population of 143,094 residents. Using Yamane's formula at 5 percent precision, a sample size of 400 respondents was selected through stratified random sampling. Data were collected using a structured questionnaire titled Impact of Road Transport Infrastructure on Agricultural Productivity and Market Access in Kura Local Government Area, Kano State (IRTIAPMAKLGAKS) and field observations. The collected data were analyzed using descriptive statistics such as frequencies, percentages, means, and standard deviations, as well as inferential tools including correlation and regression analysis. The findings revealed that poor feeder roads and inadequate maintenance significantly constrained farmers' ability to transport inputs and outputs, thereby reducing productivity and limiting access to profitable markets. The study concludes that improved rural road infrastructure would enhance agricultural output, reduce post-harvest losses, and increase farmers' income in Kura. It recommends targeted government investment in road rehabilitation, periodic maintenance of feeder roads, and community participation in infrastructure management to support sustainable agricultural development and rural livelihood improvement.

Keywords: Road Transport Infrastructure, Agricultural Productivity, Market Access, Kura Local Government Area

Corresponding Author
Abdullahi Shuaibu Abubakar
Email Address: abdullahishuaibu31@gmail.com Phone Number: +2348032130752

Received: 27/9/2025; **Revised:** 27/10/2025; **Accepted:** 18/11/2025; **Published:** 31/11/2025

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 2, ISSUE 3, 2025

INTRODUCTION

Agriculture remains a major sector of Nigeria's economy, employing over 70% of the rural population and contributing significantly to food security, employment, and income generation. However, the sector is constrained by infrastructural deficits, particularly in rural transportation. Poor access roads hinder the movement of farm produce from production centers to markets, leading to post-harvest losses, higher transaction costs, and limited profitability for farmers (Oni. (2016). Road transport infrastructure plays a critical role in agricultural development, as it connects farmers to input suppliers, extension services, and output markets. Studies have shown that accessible and well-maintained rural roads reduce travel time, lower transportation costs, and enhance farmers' market participation (Oluwasusi, 2021). This makes road infrastructure a key driver of agricultural commercialization and rural economic transformation.

In Nigeria, the state of rural roads is generally poor, with a large percentage of agricultural communities depending on unpaved and poorly maintained routes. This situation discourages private transport operators from serving remote farming areas, leading to high costs of moving produce and reduced competitiveness of agricultural products (Udeuhele, 2022). Consequently, smallholder farmers remain trapped in low-productivity cycles. Kano State is a leading agricultural hub in Northern Nigeria, producing crops such as rice, maize, tomatoes, groundnuts, and vegetables for both domestic consumption and export. Despite its agricultural potential, rural communities in areas like Kura Local Government Area face challenges of inadequate road infrastructure, which limits access to major markets in Kano city and beyond Rural Access and Agriculture Market Project (Kano RAAMP, 2023). Improving road connectivity in these areas is therefore crucial to unlocking the productivity of smallholder farmers.

Agriculture is the primary source of livelihood in Kura Local Government Area of Kano State, where many farmers are engaged in rice, maize, and vegetable production. Despite its importance, the sector continues to face challenges linked to poor road transport infrastructure, such as dilapidated feeder roads, seasonal flooding, and inadequate maintenance, which increase transportation costs, delay the movement of produce, and limit access to profitable markets. These conditions contribute to reduced productivity, high post-harvest losses, and low income for farming households. Farmers often sell at local farm-gate prices rather than accessing larger urban markets, reducing their incomes and discouraging large-scale production (Ignatius, (2022). These challenges justify an investigation into how road transport infrastructure influences both agricultural productivity and market access in the area. Although several government initiatives, such as the Rural Access and Agricultural Marketing Project (RAAMP), aim to improve rural transportation, there is limited empirical evidence on the direct impact of road infrastructure on agricultural productivity and market access in Kura LGA. This study therefore seeks to fill this knowledge gap by examining the condition of road transport infrastructure in Kura Local Government Area of Kano State,

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 2, ISSUE 3, 2025

determine the effects of road transport infrastructure on agricultural productivity and assess how road transport infrastructure influences farmers' access to markets in Kura Local Government Area of Kano State

THE STUDY AREA

The study area is Kura local government, Kano state. It lies between Latitude: 11^0 42'0"N to 11^0 52'0'N and Longitude: 8^0 24'0"E to $8^{0'}$ $36^{'}$ 0'E. It is situated some 30 kilometers south of Kano city, along Kano- Zaria road, (Figure 1.1). Kura local government covers a total land area of about 206 $km^{2.}$ The present climate of the study area is tropical wet and dry type, coded as Aw Koppen's climate classification even though some time climatic change is occurring in the past.(Ismail I. et al. 2014). The topography of the study area is generally flat. Some part of the area is characterized with marshy condition; especially the eastern part of the local government where Kano River flowing along Kura local and Dawakin Kudu local government boarder.

Kura local government has a population of about 143,094 according to 2006 National Population Census. For the purpose of this research, 2006 National Population Census data was projected up to the year 2025 based on population growth rate of Kano state at 3.3 percent, the approximate population of the local government could be 246,535. From the cultural perspective, the dominant ethnic groups are Hausa and Fulani who are mostly Muslims and predominantly engaged in primary and secondary level of economic activities respectively.

Most of rural areas of Kura local government are characterized by inadequate and poorly maintained road transport infrastructure. The condition of rural areas of Kura local government is more pathetic since they are highly deprived of infrastructural facilities, especially when compared to the urban areas. The mode of transportation nature of the study area is solely land transport type which include the following mode of transport: Animal and human porterage, road transport of different nature that consist the use of bicycle, motorcycles (commercial motorcycles), commuters but commercial motorcycles remained the dominant means of transportation for conveying passengers, good and services across the study areas. A part from the single major road that strike the study area, most part of the study site is not motor able, inadequate private vehicles and commercial taxi, commuters or trucks that can carry passengers or goods from the remotest part of the study area, irregular road network or unclear transport network to most part of the study area's hinterland (Ahmed et al. 2018).

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 2, ISSUE 3, 2025

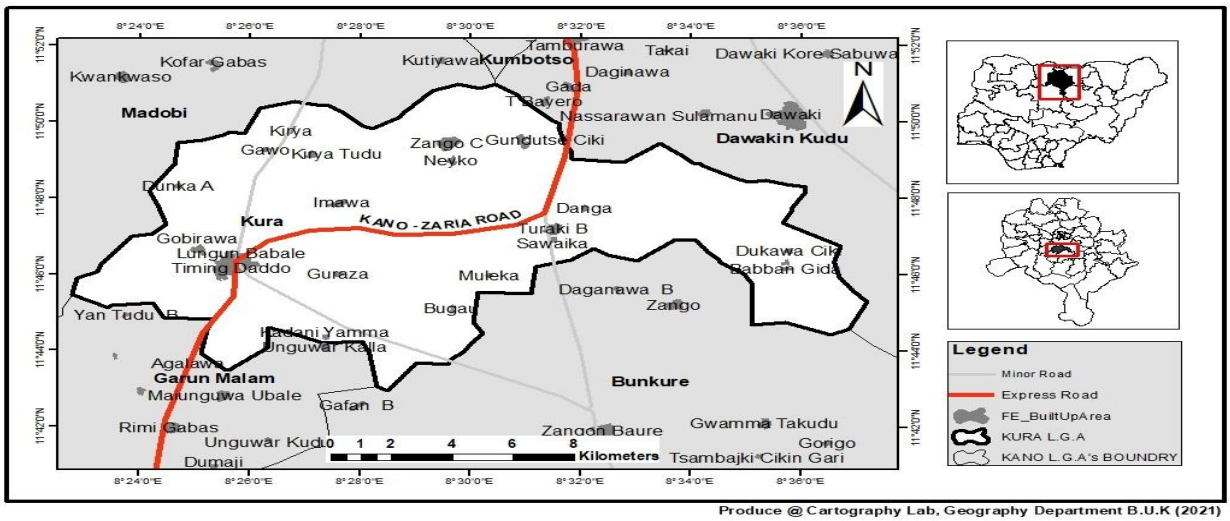

Figure 1: **Kura Local Government Area, Kano State**

MATERIALS AND METHODS

The research adopted a descriptive survey design, which enabled the collection of data from a representative sample of farmers to describe existing conditions of road transport infrastructure and its influence on agricultural productivity and market access in the study area. The target population of the study was 143,094 residents of Kura Local Government Area, most of whom are engaged in farming and agricultural trade.

To obtain the required sampled size of the individual residents living close to gully locations in the metropolis for the study, the Yamane (1973) adjusted formula was used based on the calculation of a given population variance from Dichotomous Variable at π = 0.50 and z score at 0.05 significance level.
The formula is expressed as;

$n = (z)^2 (\pi) (1 - \pi) (N) / (z)^2 (\pi) (1 - \pi) + (N) (e)^2$ ----------1

where;
n = sample size; z = 2; π = 0.50; N = population size = 143,094; e = level of precision (0.05)
Therefore

$n = n = (2)^2 (0.50) (1 - 0.50) (143,094) / (2)^2 (0.50) (1 - 0.50) + (143,094) (0.05)^2$
n = 143,094/358.735 = 398.9
Sample size = 399

The sampled size is 399 which was rounded up to 400 respondents. Stratified random sampling was employed to ensure fair representation of farmers across different communities in the LGA. Data were collected mainly through a structured questionnaire divided into sections covering road transport infrastructure, agricultural productivity, and market access, using a four-point Likert scale ranging from Strongly Agree to Strongly Disagree. Field

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 2, ISSUE 3, 2025

observations were also conducted to complement the data. The data obtained was analyzed using descriptive statistics in the SPSS environment version 20.0 based on a scale of 1- 4 (Strongly agree 4, Agree 3, Disagree 2, Strongly disagree 1). The mean values and standard deviations were used to analyze the data obtained. Data obtained from the mean value on each community's perceptions on a scale of 1- 5 (very good 4.0-5.0, Good 3.00-3.99, fairly Good 2.00-2.99, poor 1.00-1.99, very poor 0.00-0.99) was also used to judge the positive and negative perceptions of the community. Inferential statistics, including correlation and regression analysis, were applied with the aid of SPSS software to examine the relationships between road transport infrastructure, agricultural productivity and market access.

Result and Discussion

The results of the study as showed in Table 1 revealed that most rural in Kura Local Government Area are not well maintained as perceived by the community, with mean value of 1.98. The mean value of 1.98 shows that the rural road in the area are poorly manage. This indicated that the status of road network in the local government receives weak government investment as revealed by the community with mean value of 1.83. But despite the poorly nature of the road, the road leading to farms are fairly good accessible throughout the year and the condition improve during the dry season with a mean values of 2.03 and 2.73 respectively. However, the community have good perception (3.23 mean value) that poor drainage system make road in the local government area to be impassable during rainfall. The good perception of the community on the road impassable during rainfall confirms that flooding worsens the problem.

Table 1: Condition of road transport infrastructure in Kura, Kano State

Item	Statement	SA	A	D	SD	N	Mean	SD	Remakes
1	Most rural roads in Kura. Are well maintained	40	60	150	150	400	1.98	0.91	Poor
2	Roads leading to farms are accessible always	50	70	120	160	400	2.03	1.00	Fairly Good
3	Road conditions improve During the dry season.	100	150	90	60		2.73	0.98	Fair Good
4	Poor drainage systems Make roads impassable During rainfall.	200	120	50	30		3.23	0.94	Good
5	Feeder roads are adequate for transporting farm Produce.	60	90	120	130		2.20	1.01	Fairly Good
6	Government has invested adequately in rural road Development.	30	50	140	180		1.83	0.93	Poor
Grand mean:		**2.34, 0.96.**		**Road condition generally fairly good.**					

SA: Strongly Agree; A: Agree; D: Disagree; SD: Strongly Disagree.

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 2, ISSUE 3, 2025

Findings from the community as revealed in Table 1 shows that feeder road that connects farms and other parts of the local government area are fairly good adequate for transportation of farm produce to markets. This finding supports Jimoh and Araromi (2024), who reported that weak drainage and bad roads in Ondo State disrupted farm transportation. Similarly, Ignatius (2022) observed that seasonal flooding in Benue and Kogi States severely reduced rural accessibility. Therefore, the study confirms that inadequate road infrastructure is a major barrier to agricultural productivity.

The findings of the study revealed that the condition of rural roads in Kura Local Government Area is generally poor, with overall mean values below average, indicating inadequate investment and maintenance. Respondents noted that seasonal flooding and poor drainage made roads impassable, leading to delays in farm operations and transportation of produce. This result supports the findings of Jimoh and Araromi (2024), who observed that poor road conditions in Ondo State led to spoilage of farm produce and discouraged expansion in agricultural activities. These similarities suggest that poor road infrastructure is a widespread challenge in rural Nigeria, directly undermining productivity and market participation. This finding is supported by Ignatius (2022), who reported that poor rural roads in Benue and Kogi States increased post-harvest losses and constrained rural development. These studies support the conclusion that weak infrastructure limits agricultural potential in rural Nigeria.

Table: 2 Effects of road transport infrastructure on agricultural productivity in Kura Local Government Area of Kano State

	Item statement	SA	A	S	SD	N	Nean	SD	Remak
1	Poor roads increase post-harvest losses.	220	110	50	20	400	3.33	0.88	Good effect
2	Poor road conditions delay input supply to farmers.	210	120	50	20	400	3.30	0.87	Good effect
3	Good road networks Encourage farmers to expand production.	180	130	60	30	400	3.15	0.95	Good effect
4	Poor roads discourage farmers from cultivating larger hectares.	200	120	50	30	400	3.23	0.92	Good effect
5	Road conditions determine How fast perishable goods Reach the market.	210	130	40	20	400	3.33	0.85	Good effect
6	Poor roads increase transport costs for farm produce.	220	120	40	20	400	3.35	0.82	Good effects

Grand mean: 3.28 0.88. Road conditions have good effect on agricultural productivity.

Keys: SA Strongly Agree. A: Agree. D: Dis Agree. SD: Strongly Dis Agree.

On the effects of road transport infrastructure on agricultural productivity in Kura Local Government Area of Kano State from Table 2 revealed that there is good perception from the community that, poor roads increase post-harvest losses, poor road conditions delay input

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 2, ISSUE 3, 2025

supply to farmers, good road networks encourage farmers to expand production, poor roads discourage farmers from cultivating larger hectares, road conditions determine how fast perishable goods reach the market and poor roads increase transport costs for farm produce. The mean values above 3.0 in all the variables in Table 2 indicate that respondents agreed on the negative influence of poor infrastructure on productivity. This result is supported by Babatunde. (2014), who emphasized that poor rural roads in Oyo State increased farmers' production costs and limited farm expansion. This result aligns with Nwafor et al. (2020), who found that improved roads under the Rural Access and Mobility Project in Kaduna State enhanced farmers' productivity and market participation. In the same vein, Oluwasusi and Adeyemo (2021) showed that rehabilitated roads reduced post-harvest losses and encouraged higher agricultural output. These findings reinforce the view that road infrastructure is a critical factor in improving productivity and expanding market opportunities for farmers.

On the assessment on how road transport infrastructure influences farmers' access to markets in Kura Local Government Area of Kano State, findings from Table 3 indicated that poor roads limit market access, with high means for transport delays, spoilage of perishable produce, and high costs of getting to urban markets.

Table 3: How road transport infrastructure influences farmers' access to markets in Kura

	Item statement	SA	A	S	SD	N	Nean	SD	Remak
1	Poor roads force farmers to Sell at lower prices within villages.	210	120	50	20	400	3.30	0.86	Good effects
2	Good road access allows farmers to reach major Kano markets.	190	130	50	30	400	3.20	0.91	Good effects
3	Farmers with poor road access spend more on transportation.	220	120	40	20	400	3.55	0.83	Good effects
4	Poor road networks limit the number of buyers who come to villages.	200	130	50	20	400	3.28	0.88	Good effects
5	Road condition determines farmers' bargaining power in markets.	180	140	60	20	400	3.20	0.90	Good effects
6	Farmers with better road access enjoy higher incomes	190	130	60	20	400	3.23	0.89	Good effects

Grand mean: 3.26 0.88. Road infrastructure has strong influence on market access.

Keys: SA Strongly Agree. A: Agree. D: Dis Agree. SD: Strongly Dis Agree.
Source: Authors' Analysis (2025).

Respondents agreed that while dry-season access is somewhat easier, rainy-season road damage reverses these gains. This outcome supports the findings of Oluwasusi and Adeyemo (2021),

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 2, ISSUE 3, 2025

who noted that rehabilitated roads in Ekiti State reduced post-harvest losses and improved farmers' ability to sell produce. Similarly, Nwafor et al. (2020) confirmed that better roads increased farmers' participation in markets under the RAMP project in Kaduna. These results reinforce the position that road networks are vital for ensuring consistent and profitable market access for rural farmers. Thus, the present findings reinforce the position that road infrastructure is a critical determinant of achieving sustainable agricultural productivity.

The results from Table 4 on correlational analysis, shows that there is strong negative relationship (-0.78120298) between condition of road and road transport infrastructure. This indicated that as road transport infrastructure increases the poor condition of road tend to decrease and as such smooth movement of people from one place to another tend to be good due to increase improvement of road infrastructure. Also from Table 4 it can be deduced that there is a moderately relationship (0.449584024) between condition of road and farmers' access to market. This showcase that there is linear relationship between the road condition and farmers access to markets. This is because as road conditions continue to improve, farmers' access to market also improves. On the contrary, if the conditions of road continue to be in poor state, farmers access to market become difficult.

Table 4: Correlational Analysis

Indicators	**Condition of road**
Road transport infrastructure	-0.78120298
Farmers' access to markets	0.449584024

Source: Authors' Analysis (2025).

A significant relationship was found between road condition and the set of factors variables that cause the poor nature of the road given a multiple correlation coefficient (multiple R) of 88.1% and coefficient of determination (r^2) of 77.6% (Table 5). This indicates that the set of variables in the equation can predict approximately 88% of the condition of road (dependent variable) assuming that intercepts were included in the equation and can explain up to 78% of the road condition. The adjusted r^2 is said to clear the issues that arise from addition of a new variable. Any addition of an independent variable will have a positive effect on the coefficient of determination.

Table 5: Regression Analysis

Multiple R	0.881049
R Square	0.776247
Adjusted R Square	0.627079
Standard Error	0.328782
Observations	6

Source: Authors' Analysis (2025).

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 2, ISSUE 3, 2025

Summary of Major Findings

The findings of this study revealed that road transport infrastructure in Kura Local Government Area are generally poor, with inadequate investment and maintenance. The study further established that poor road infrastructure significantly affects both agricultural productivity and market access in Kura. Respondents agreed that poor roads increase input costs, reduce access to labor, and discourage large-scale farming, while also limiting timely access to markets. The high mean values indicated that farmers agreed poor roads raise input costs, reduce access to labor, and discourage large-scale farming.

Furthermore, market access was constrained by spoilage of perishable goods, high transportation costs, and limited reach to urban markets. The result from correlation analysis shows that there is a strong negative relationship (-0.78120298) between the condition of road and road transport infrastructure. Also a significant relationship was found between road condition and the set of factors that cause the poor nature of the road given a multiple correlation coefficient (multiple R) of 88.1 percent and coefficient of determination (r^2) of 77.6 percent respectively (Table 5).

CONCLUSION AND RECOMMENDATIONS

This study concludes that road transport infrastructure in Kura Local Government Area of Kano State is generally poor, with inadequate investment and maintenance. The study further established that poor road infrastructure significantly affects both agricultural productivity and market access in Kura. Furthermore, the study concluded that poor road infrastructure is the major cause of spoilage of perishable goods, high transportation costs, and limited market access to urban markets.

In consideration of the finding and conclusion, the makes the following recommendations:

- Investment in Rural Road Infrastructure:

Government and local authorities should prioritize the rehabilitation and construction of rural feeder roads in Kura Local Government Area to reduce transportation costs, minimize post-harvest losses, and improve access to inputs. Also adequate drainage systems should be constructed alongside rural roads to prevent flooding and road washouts during the rainy season.

- Public-Private Partnership (PPP) in Infrastructure Development:

Collaborations between government, private investors, and farmer cooperatives should be encouraged to finance and maintain rural transport infrastructure.

- Support Services for Farmers:

Transport cooperatives, affordable vehicles, and rural logistics services should be introduced to reduce costs and enhance farmers' ability to access profitable markets.

- Integration with Agricultural Policy:

Road infrastructure development should be integrated into agricultural policies at both state and federal levels.

Competing Interest

The authors have declared that no conflict interest exist in this manuscript

REFERENCE

Ismail I., Yakudima M.,Alhaji A., Baba N. (2014): An overview of the Physical and Human setting of Kano Region, Nigeria. *Research Journal of Geography, 1*(5).

Adelugba, I. A. (2022). The effect of road network on the marketing of agricultural produce in Irepodun/Ifelodun LGA, Ekiti State, Nigeria. *International Journal of Business Management.*

Babatunde, R. O., Omotesho, O. A., & Sholotan, O. S. (2014). Socio-economic characteristics and food security status of farming households in Nigeria: Evidence from Oyo State. *Journal of Agricultural Extension and Rural Development, 6*(2), 89 – 97. https://doi.org/10.5897/JAERD2013.0529

Daud, K., Adeoye, I., Olojede, I., & Aderibigbe, H. (2024). Synergy between transportation infrastructure and food crop production in Oyo State, Nigeria. *International Journal of Economics, Business and Management Research, 9*(2), 123 – 135.

Ezeudu, T. S., & Obimbua, E. N. (2024). Enhancing rural market access and value chain integration for sustainable agricultural development in Nigeria: Constraints, strategies, and implications. *International Journal of Research and Innovation in Social Science*.

Fuwape, I. A., & Ogunjo, S. T. (2018). *Modeling of raining season onset and cessation of tropical rainfall for climate change adaptation in agriculture*. arXiv preprint.

Ignatius, A. A. (2022). Rural road infrastructure and agricultural development in Nigeria: Evidence from Benue and Kogi States. *African Journal of Sustainable Development, 12*(1), 45 – 58.

Ifenkwe, G. I. (2011). Rural roads and agricultural entrepreneurship in Abia State, Nigeria. *Journal of Agricultural Sciences and Rural Development, 3*(4), 32 – 40.

Jimoh, A., & Araromi, T. A. (2024). The perceived effect of rural transportation on agricultural produce in Igbara-Oke, Nigeria. *Journal of Inclusive Cities and Built Environment*.

Nwafor, J. C., Ibrahim, M., Umar, I. S., & Tsado, J. H. (2020). Effects of Rural Access and Mobility Project (RAMP) on well-being of crop farmers in Kaduna State, Nigeria. *Advanced Journal of Agriculture and Ecology*.

Olowe, F. (2023). Rural road access and post-harvest loss reduction in Nigeria: Implications for value chains. *Nigerian Journal of Agricultural Economics, 15(*1), 88 – 99.

Olorunfemi, S. O. (2020). Rural road infrastructural challenges: An impediment to agricultural development in Idanre LGA, Ondo State, Nigeria. *Ghana Journal of Geography, 12*(2).

Oluwasusi, J. O., & Adeyemo, F. O. (2021). Road rehabilitation and farmers' productivity in Ekiti State, Nigeria. *Journal of Agricultural Policy and Research, 9*(4), 123–132.

Oni, T. O. (2016). Socio-economic determinants and profitability of cassava production in Nigeria. *International Journal of Agricultural Economics and Extension*, *4*(4), 229–249.

Rahman, S. A., Haruna, I. M., & Alamu, J. F. (2002). Economic performance of maize using organic and inorganic fertilizers in Soba Area of Kaduna State, Nigeria. *ASSET Series A: Agriculture and Environment*.

Sun, Y., Chen, L., & Adebayo, A. (2023). Rural accessibility and agricultural transformation in Sub-Saharan Africa. World Development Perspectives, 31, 100455. https://doi.org/10.1016/j.wdp.2023.100455

Udeuhele, G. I., & Eze, A. V. (2022). Rural roads and the quest for agricultural development in South-East Nigeria. *Global Journal of Social Sciences*, 21(2).

Usman, Z. A., Ritter, K., & Vinogradov, S. A. (2016). The dynamics of income inequality in rural areas of Nigeria. *Asian Journal of Agricultural Extension, Economics & Sociology*, *11*(4), 1–13.