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ASSESSING THE IMPACT OF RURAL ROAD NETWORK ON THE PATRONAGE OF RURAL MARKETS IN LAFIA LOCAL GOVERNMENT AREA, NASARAWA STATE, NIGERIA

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ABSTRACT

This study examines the relationship between rural road infrastructure and access to rural markets in Lafia Local Government Area (LGA) of Nasarawa State. The main objectives of the study are to map out the rural road and market centres in the area, categorize the different types of rural markets, and assess the challenges faced by the patronizers of rural markets. The research methodology involves a mixed-methods approach, combining qualitative and quantitative data collection through surveys, interviews, field observations, and focus group discussions. Geographic Information System (GIS) mapping was used to analyze the spatial distribution of rural markets in relation to the road network. The study adopts purposive sampling to select wards with rural periodic markets, ultimately choosing four wards for the research. The study found out that the market centers were sparsely distributed and categorized into daily (20%) and periodic markets (80%). The major challenges faced by traders were poor condition (potholes, waterlogging) of road (21%), high transport charges (45%) and reduction in market patronage (19%). The implications of the study are the poor condition of rural roads is not only a transportation issue but also has broader economic and social implications, affecting the well-being of the local population and the functioning of the markets in the study area.

Key words: Assess Impact, Rural Road network, rural market, Patronage.

INTRODUCTION

Rural road and market access are closely interconnected, as rural roads provide the physical infrastructures that enable rural communities to access periodic markets Ondiege, Moyo, and Verdier-Chouchane (2013). Access to markets is important for rural communities to develop and reduce poverty. It helps them sell their products and improve their livelihoods Mkhabela (2013). In Nigeria, the mode of connectivity for rural roads varies. It typically includes paved roads, gravel roads, and sometimes even dirt roads Aggarwal (2018). The connectivity depends on the specific location and level of development in each of rural area. However, there is growing effort to improve rural roads infrastructures across the country to enhance connectivity and promote economic development in rural communities (Robert and Townsend, 2016).

Having access to well-maintained roads that connect rural areas to periodic markets is crucial for the economic development of rural communities. It allows for the smooth transportation of goods, promotes trade, and stimulates economic growth in these areas Liu, Zhao, Tang and Gong (2022). Lack of rural road access can hinder farmers from selling their produce or force them to rely on middlemen who transport their goods at lower prices. Accessible roads are vital not only for economic growth but also for survival and well-being. It is crucial to invest in road infrastructure, especially in remote and rural areas, to ensure equal access for all Cook, Huizenga, Petts, Visser,



and Yiu (2017). Periodic markets play a crucial role in the functioning of rural areas. They serve as important gathering places where people can buy and sell goods, exchange information, and build social connections. These markets are essential for the economic and social well-being of rural communities (Kithuka, 2019).

In any rural community of the world, the impacts of rural roads on the patronage to rural markets play a pivotal and often a decisive role in determining the overall productivity and development of a rural economy as well as the good and quality of life of its dwellers. The insensitivity of the government to provide adequate roads may impose additional stress on the available ones which are not regularly maintained, leading to eventual breakdown in many instances. Rural areas in Africa are made up of people who are poor and characterized by a low educational standard. These Africa rural areas are capable of offering the highest opportunity capable of transforming the continent through adequate agricultural production reinforced by reliable and adequate transportation (Olorunfemi and Adenigbo, 2017).

Rural periodic markets serve as a vital component of economic activity by facilitating the movement of goods, people, and services. They contribute to enhancing human satisfaction by enabling the exchange of goods and services across different locations. These markets play a crucial role in improving access to essential resources and fostering economic growth in rural areas (Ademiluyi and Solanke, 2002).

In this study, the term "market" refers to a regulated public gathering of buyers and sellers who come together at a specific location and time to engage in the exchange of products. It is a designated space where transactions take place under certain rules and conditions (Mohammed, 2013). In the Republic of Ghana, just like in other sub-Saharan African countries, rural roads are a crucial part of the rural infrastructure system and play a significant role in the overall development of rural areas. These roads provide access to essential facilities like healthcare, education, and markets that are typically found in urban centers. Moreover, rural roads connect rural settlements to urban market centers, making them vital for agricultural production, poverty alleviation, and economic growth in rural areas. However, the poor condition of rural roads poses a significant challenge to rural markets and overall development efforts (Rietveld and Bruinsma 2012).

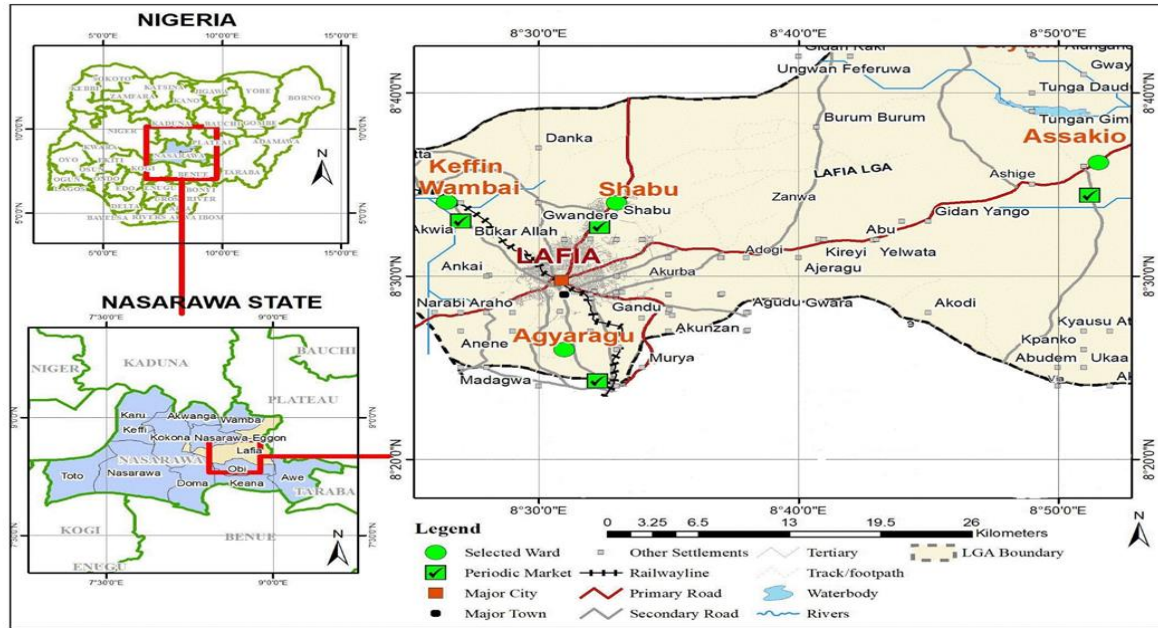
It was observed that most of the rural roads in the study area leading to markets become almost inaccessible, especially during rainy seasons, and markets not holding on market days simply because of the poor nature of rural roads. Some of the roads are untarred, uncompleted with dead end, very narrow and others characterized by potholes. Also the poor state of the rural road within the study area, apart from having undesired influence on the rural markets patronage, results in substantial loss of perishable agricultural goods, high cost of moving agricultural produce to markets and even the exorbitant cost of produce. It is against this backdrop, that marketers and rural communities find it difficult to have access to the market in the study area. Hence, it has become imperative to analyze rural road network accessibility to periodic markets in Lafia LGA of Nasarawa State, Nigeria.

The aim of this study is to assess rural road network on the patronage of rural periodic markets in Lafia Local Government Areas (L.G.A) of Nasarawa State. This aim will be achieved through the following objectives; to map out rural roads and periodic market centres in Lafia LGA, to categorize the types of rural markets in the study area and to examine the challenges experienced by patronizers to periodic markets in the study area.

MATERIAL AND METHODS

The Study area

Lafia is the headquarters of Nasarawa State. It is located within Latitude 8°20' and 8°38' N and Longitude 8°31' and 8°40'E with an average elevation of 290m above mean sea level. Its population is 330,712 (National Population Census result 2006). It shares boundaries with Nasarawa Eggon LGA to the North, Obi LGA to the South, Doma LGA to the West and Plateau State to the East. The LGA is made up of 13 wards (Akwa et al, 2007).



METHODOLOGY

Sources of Data

Data were sourced via field observations, questionnaire administration, focus group discussions and oral interview. The questionnaire was constructed and data were obtained on socio-economic characteristics of the people, their perception on the nature of roads linking their villages to other areas, road type and the transportation problems they encounter. Also, the data were obtained on the location and conditions of markets available, distance covered to use market.

Data were also obtained from relevant government ministries and agencies. The ministries concerned are the Ministry of Works and Transport, Ministry of commerce and industry, other government agencies include, Nasarawa Geographic information system. (NAGIS), National population commission, and the secretariats for the sampled wards. Other relevant information were sourced from published and unpublished texts, articles, Journals and other documentary materials, publications of the World Bank.

Sample Size and Sampling Techniques

A purposive sampling technique was adopted for the study to choose wards that have rural periodic markets. Therefore, four wards were selected for the study. Hence all rural periodic markets from each of the four wards were selected. They are Assakio ward (Assakio and Ashangwa Markets), Agyaragu ward (Agyaragu market), Shabu/kwandere ward (Alhamis market), Keffin wambai ward (B.A.D market).

Therefore, to obtain the sample size for the study, 1991 population census was used to project the population from 1991 to 2021. The use of 1991 census as against 2006 was predicated on the fact that 1991 population census have been disaggregated into communities unlike the 2006 population that contains only that of the entire local government. A simple equation for population projection by (Wilmoth 2018), can be expressed as: $N_t = P e^{rt}$

In this equation, (N_t) is the number of people at a future date, and (P) is equal to the present population. Next to (P) is (e), which is the natural logarithm base of 2.71828; (r) represents the rate of increase divided by 100 (this gives 0.03 in this case), (t) represents the time period (i.e. 30 years in this case) and ($*$) represent multiplication sign. Therefore, the list of selected communities, their population in 1991 and the 2021 projection is shown in Table 2.1.

Table 1 Projected Populations for the Sampled Communities in Lafia LGA

S/No.	Wards	Selected Communities	1991 Population	Projected 2021 population
1	Assakio	Assakio	17,969	44,197
2	Agyaragu	Agyaragu	4,177	10,274
3	Keffin/Wambai	B.A.D	4,275	10,515
4	Shabu/Kwandare	Kwandare	10,397	25,499
Total	4	4	36,818	90,485

Source: Author's Compilation, (2022).

Yamane (1967), formula was used to determine the sample size for the known population. The formula is $n = \frac{N}{1 + N(e)^2}$, where n is the sample size, N is the population size, and e is the level of precision (5%).

When this formula is applied to the population of the sampled communities, we have;

$$n = \frac{90,485}{1 + 90,485(0.05)^2}$$

$$= \frac{90,485}{226.2} = 400$$

Based on the above, the researcher adopted 400 as the sample size for the study. In determining the sample size for each community in the study area, Stat Trek formula (2012), were used, i.e, $nh = \frac{Nh}{N} \times n$,equation 2, where nh = sample size of each community, Nh = projected population



of each community, N= projected population for the entire community and n= adopted sample size, was used to calculate the size for each sampled community (Table 1)

Table 2 Sample Size for the Selected Communities in Lafia LGA

S/No.	Sampled Community	2021 population	Sample Size
1	Assakio	44,197	195
2	Agyaragu	10,274	45
3	B.A.D	10,515	47
4	Kwandare	25,499	113
Total	4	90,485	400

Source: Authors compilation, (2022).

1.2.3 Questionnaire administration

A total of 400 copies of the questionnaire were administered in Assakio, Agyaragu, Barikin Abdullahi (B.A.D) and Kwandere communities while 340 were retrieved. In Assakio community, 195 copies of questionnaire were administered but 176 copies of questionnaire were retrieved. In Agyaragu community 45 copies of questionnaire were administered but 38 copies of questionnaire were retrieved. In B.A.D community 47 copies of questionnaire were administered but 38 copies of questionnaire were retrieved. In Kwandere community 113 copies of questionnaire were administered but 88 copies of questionnaire were retrieved. The number of questionnaires not retrieved amounted to 60. This was due to perceived inability to meet with the respondents in the selected communities as at the time of data collection, which makes it difficult to have access of some respondents. The distribution of the questionnaires and the copies retrieved by each community is presented in the Table

Table 3: Distribution of the questionnaire and the copies retrieved by each community

S/No.	Sampled Communities	Copies of Questionnaire Administered	Copies of Questionnaire Retrieved
1	Assakio	195	176
2	Agyaragu	45	38
3	B.A.D	47	38
4	Kwandare	113	88
Total	4	400	340

Source: Authors compilation, (2022).



Method of data analysis

The method of analyses was as follows: Descriptive statistics such as counts and percentages were used to analyze the socio-economic and demographic characteristics of the respondents and factors hindering rural periodic market patronage.

Objective I: identify and map out the existing rural roads and market centers in the study area: (GARMIN etrex 10), hand held GPS receiver was used to pick the positional coordinates of rural roads which link the rural market as well as the existing market centres in the study area. The satellite imagery of the study area was used to digitize using ArcGIS software.

Objective II: categorize the types of rural markets in the study area.

In order to categorize the types of rural markets in the study area, the systematic and data driven approach was used to obtain the information from the local residents, market vendors and community leaders. Descriptive statistics such as frequencies and percentages were also used to explain the types and characteristics of rural markets in the study area and data were presented using charts, tables and plates etc.

Objective III: To examine the challenges of rural road network provision on rural markets.

In order to examine the challenges of rural roads network on rural markets, statements bordering on the influence of roads on the patronage of markets was obtained from rural market patronizers.

Descriptive statistics such as frequencies and percentages were also used to explain the challenges of rural markets in the study area and data was presented using tables.

Results and Discussion

This deals with the presentation and analysis of data collected from the field. It covers the demographic characteristics of respondents, types of rural road and rural markets, their spatial distribution, conditions as well as the patronage of the markets. In addition, rural road challenges were also examined.

Gender Distribution of the Respondents

Table 3.1 presents the gender distribution of the respondents in the study area. This is because gender plays an important role in rural market attendance ranges from selling of goods, loading and offloading, tailoring, wheel barrow pushing, revenue collection etc.

Table 4: Gender Distribution of the Respondents.

Wards	Males		Females		Total	
	Freq.	%	Freq.	%	Freq.	%
Assakio	113	33.24	63	18.53	176	51.76
Agyaragu	24	7.06	14	4.12	38	11.18
Keffin Wambai	21	6.17	17	5.00	38	11.18
Shabu/Kwandare	51	15.00	37	10.88	88	25.88
Total	209	61.47	131	38.53	340	100.00

Source: Field work, (2022).

Information on gender shows that male has a higher number (209) representing 61% while 38% goes to the female. The result on the Table 4.1 shows further that the number of male's responses is greater than that of females in all the wards. It also implies that; the numbers of males are more than females in the community in terms of rural market activities. This study is in agreement with Addah and Ayamba (2019), who studies "Gendered Livelihoods."

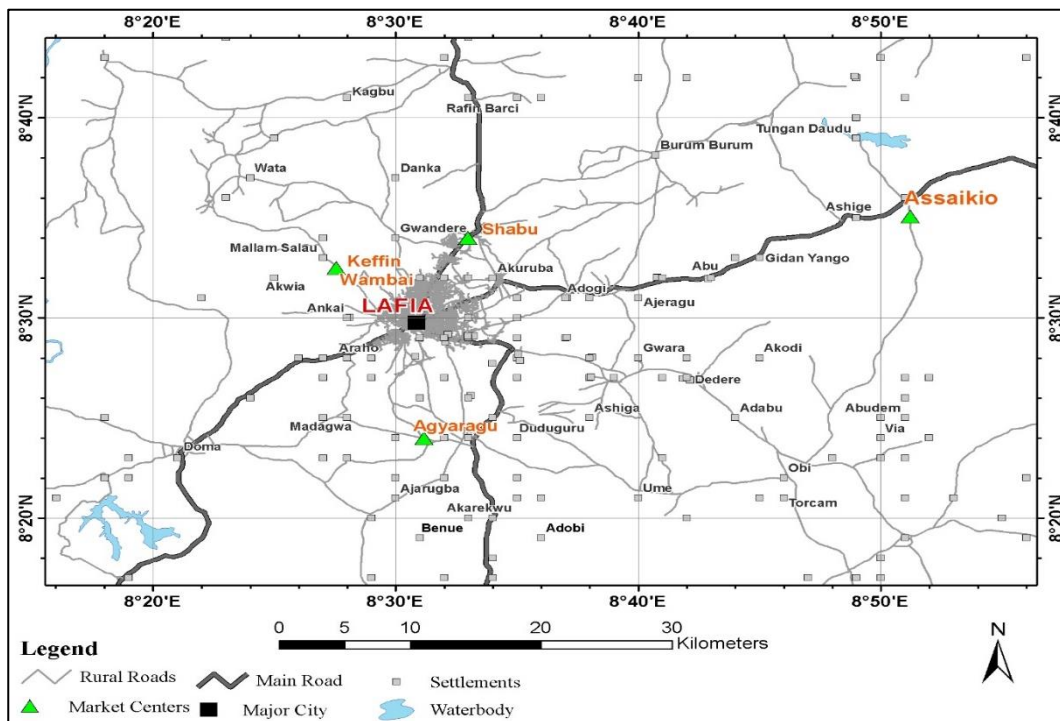


Figure 2: Rural Roads and Markets Centers in the Study area
 Source; Remote Sensing and GIS Unit, Gombe State University, (2022).

The study provides evidence that men are more engaged in rural market activities than women. The study was conducted in northern region of Ghana and used a mixed-methods approach, including household surveys and focus group discussions, to explore the gendered dynamics of agricultural livelihoods in the region. The study found that men were more likely to engage in cash crop farming and marketing activities, such as cocoa and shea nut production, while women were more likely to engage in subsistence crop farming and domestic activities. Men also had greater control over productive assets such as land and equipment, which gave them more opportunities to engage in market-oriented activities.

3.2 Rural Roads and Markets Centres in the study area

Rural Roads are often treated as the link of the transport network. Despite this, they often form the most important link in terms of providing access for the rural population. Their permanent or seasonal absence will act as a crucial factor in terms of the access of rural communities to basic services such as education, primary health care, water supply, local markets and economic opportunities.

Market Centre

Market Centre is a location where people regularly gather for the purchase and sale of provisions, livestock, and other goods in different parts of the study area (See plate I, and II). Some markets operate daily while others are held once a week or on less frequent specified days such as festival days and are said to be periodic markets. The form that a market adopts depends on its locality's population, culture, ambient and geographic conditions.



Plate I: Assakio market
Source; Field work, 2022



Plate II: B.A.D market
 Source; Field work, 2022

Table 5: Types of markets

Wards	Regional		Periodic		Daily		Daily & Periodic		Total	
	No.	%	No.	%	NO.	%	NO.	%	NO.	%
Assakio	-	-	143	42	-	-	31	9	174	51
Agyaragu	-	-	29	9	-	-	12	4	41	12
Keffin/Wambai	-	-	43	13	-	-	-	-	43	13
Shabu/Kwandare	-	-	56	16	-	-	26	7	82	24
Total	0	0	271	80	0	0	69	20	340	100

Source; Field work, 2022

Nature and types of rural Markets

Based on the nature and types of rural markets in the study area, markets were classified into regional, periodic daily and both daily and periodic markets, marketers usually visit the markets on week, bi-weekly basis and so on and so forth.

Table 5 shows that a greater proportion (80%) of the markets in the study area were periodic markets, both daily and periodic market constituted 20%, while regional and daily market have no response.

Challenges of rural road on the market Patronage

Roads connecting many of the settlements are in Poor condition such as narrow and unpaved while most of the paved roads have broken surfaces with a lot of pot holes. Others effects are lack of maintenance by residents of the study area due to poor attitude towards community service. This is a very important problem identified in the study area as 45% of the respondents regard this as a very serious problem.

Table 6: Challenges of Rural Road on market Patronage

Wards	Poor condition of the road		Increase rural poverty		High transport charges		Reduction in market patronage		Total	
	No.	%	No.	%	NO.	%	NO.	%	NO.	%
Assakio	24	7.1	16	4.7	89	26.1	33	9.7	162	48
Agyaragu	22	6	11	3.2	5	1.4	6	1.7	44	13
Keffin/Wambai	26	7.6	13	3.8	-	0	4	1.1	43	12
Shabu/Kwandare	-	0	10	2.9	58	17	23	6.7	91	27
Total	72	21	50	15	152	45	66	19	340	100

Source; Field work, 2022

Table 6 shows, how rural road affect market patronage in the study area, whereby about 21% of the respondents said it as a results of poor condition of the road, followed by increase in rural poverty with about 15%. High transport charges are the major problems that usually affect patronizers of rural market which constituted about 45% and 19% is with Reduce market size. (See plate III below). Discussion with one of the key leader in the study area confirmed this as his opinion.

“We suffered a lots due to problem of road, hence it leads to high cost of transport in accessing the rural markets, is a significant barrier for me to transport and eat into the profits, which makes me difficult to compete with products from urban areas. Nowadays our movements have been very restricted due to poor of the rural road”. (Eugene, 02/03/2022).

This is in agreement with Ajiboye and Afolayan (2009), who conducted a study to investigate the effects of rural roads on agricultural production in Nigeria. The study focused on the Odeda Local Government Area of Ogun State, Nigeria, and used survey data from 200 farmers. The study found that rural roads have a significant positive effect on rural activities. Specifically, the study found that improved rural roads led to high increase in the amount of crops harvested by farmers, as well as an increase in the income generated from rural market activities.

The study also found that improved rural roads led to an increase in the availability of agricultural inputs such as fertilizers and improved seed varieties. This, in turn, led to an increase in the quality and quantity of crops produced by rural farmers.

The study concluded that the provision of rural roads is an important factor in improving agricultural production in rural areas. The authors recommended that the government should invest in the construction and maintenance of rural roads to improve the living standards of rural farmers. Overall, the study of Ajiboye and Afolayan (2009), provides evidence of the positive effects of rural roads on agricultural production and the livelihoods of rural farmers in Nigeria.



Plate III: A Rural Road to B.A.D Market.
Source; field work, 2022

Findings of the research

The study found that the condition of the rural road network in the study area has significantly hindered the usage of the markets. The poor state of the roads has made it difficult for people to access the markets, affecting their ability to buy and sell goods. This constraint has had a negative impact on the overall functioning and success of the markets.

The implications of the finding are as follows:

Potential for Improvement: This finding highlights an area where improvements in road infrastructure could have a positive impact. By addressing the poor state of the rural road network, there is potential for revitalizing local markets, improving economic conditions for the community, and enhancing overall quality of life.

Access to Markets: The poor condition of rural roads in the study area is hindering people's ability to access local markets. This suggests that residents, especially those in rural areas, may face difficulties in reaching these markets for buying and selling goods.

Economic Impact: The limitation in accessing markets has a negative economic impact. It means that people in the area may have reduced opportunities to engage in economic activities, impacting their livelihoods and financial well-being.

Market Functionality: The finding also suggests that the overall functionality and success of the local markets are being compromised due to these road constraints. If people can't easily access these markets, it can affect market dynamics, the availability of goods, and the vibrancy of the local economy.



CONCLUSION

In conclusion, the analysis of the impact of the rural road network on the patronage of rural markets in Lafia Local Government Area of Nasarawa State reveals that the poor condition of the roads significantly hinders people's ability to access the markets. This constraint has a negative effect on the overall functioning and success of the markets. Improving the rural road infrastructure is crucial to enhance market accessibility and promote economic activities in the area.

RECOMMENDATION

Based on the findings, the following recommendations can be considered:

1. **Road Maintenance:** The government should invest in road maintenance and improvements to ensure better accessibility to markets. This can involve repairing potholes, ensuring proper drainage, and overall upgrading of the road network.
2. **Public Transportation:** The government and Non-governmental Organization should consider establishing or improving public transportation services to connect rural areas with markets. This can help those without personal transportation means access the markets.
3. **Community Engagement:** Engage the local community in road maintenance and improvement initiatives. This can include community-based road repair projects or involving residents in decision-making.
4. **Market Support:** The youth and community leaders should provide support to the markets themselves, such as organizing events or promotions to attract more customers. This might offset the negative impact of the road conditions.
5. **Government Policies:** Advocate for policies that support rural development and infrastructure improvement, especially in areas where markets play a crucial economic role.



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