

Impact of Poor Road Network Accessibility on Trade and Livelihoods in Selected Communities of Sardauna LGA, Taraba State

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Abstract

This study examines the impact of poor road network accessibility on trade and livelihoods in Mayo Ndaga, Sardauna LGA, Taraba State. The study aims to assess the impact of poor road infrastructure on economic activities, identify livelihood challenges, and highlight road maintenance issues. Guided by the Central Place Theory, which explains how infrastructure influences economic linkages, the study employs a descriptive research design with a qualitative approach. Data were collected through observation, with the road network serving as the primary subject of analysis. Findings reveal that poor road accessibility increases transportation costs, limits market access, and reduces profitability for traders, thereby negatively impacting local commerce. Additionally, inadequate roads restrict access to essential services and limit income-generating opportunities, worsening financial instability among residents. Key challenges include government neglect, poor maintenance, and seasonal road deterioration. The study concludes that improving road infrastructure is critical for sustainable rural economic development. Recommendations include government investment in road rehabilitation, community-driven maintenance programs, and public-private partnerships to ensure long-term infrastructural improvements. Addressing these challenges will enhance trade, improve livelihoods, and foster economic growth in rural communities.

Keywords: Road network, Trade, Livelihood, Infrastructure, Development

Introduction

The accessibility of road networks is a critical determinant of socioeconomic development in communities worldwide. Efficient transportation infrastructure facilitates trade, enhances livelihoods, and promotes overall growth. Conversely, inadequate road accessibility can impede economic activities, restrict access to essential services, and perpetuate poverty. This study examines the effects of poor road network accessibility on trade and livelihoods in the specific communities of Mayo Ndaga, Kuma, and Kila in Sardauna Local Government Area (LGA), Taraba State, Nigeria.

Globally, the significance of road infrastructure in economic development is well-documented. The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) highlights that improved rural transport can lead to price changes in inputs and outputs, affecting agricultural productivity and poverty levels (UNESCAP,2016). In sub-Saharan Africa, the World Bank estimates that poor rural road conditions can increase transportation

costs for agricultural products by up to 80%, leading to lower profits for farmers and limiting their competitiveness (World Bank. (2019).

In Nigeria, the challenges posed by inadequate road infrastructure are pronounced. A World Bank policy brief indicates that large intra-national trade costs and poor transport infrastructure constitute significant obstacles for local development in rural Nigeria. In 2007, it was estimated that less than half of the rural population lived within 2 kilometers of an all-weather road, leaving about 30 million Nigerians in near isolation with limited access to social services (World Bank, n.d.). This lack of connectivity hampers the movement of goods and people, stifling economic growth and access to essential services.

Focusing on Taraba State, studies have underscored the adverse effects of poor road networks on local economies. Research examining the impact of road construction on land use patterns in Jalingo LGA reveals that inadequate transportation facilities hinder economic activities and limit access to markets (Adebayo & Oruonye, 2012). Similarly, an assessment of the socio-economic impact of urban development-induced resettlement in Jalingo Metropolis highlights that insufficient road infrastructure disrupts livelihoods and exacerbates poverty (Oruonye, 2013). In rural communities, the situation is particularly dire. A study on the effects of poor infrastructural facilities in Ussa LGA, Taraba State, documents that inadequate road networks impede socio-economic development by restricting access to markets, healthcare, and education (Oruonye, 2014). This infrastructural deficit leads to reduced agricultural productivity and income, as farmers struggle to transport their produce to markets efficiently.

The communities of Mayo Ndaga, Kuma, and Kila in Sardauna LGA, characterized by their agrarian economies, are not exempt from these challenges. The region's topography and limited road infrastructure exacerbate the difficulties faced by local farmers and traders. Poor road conditions result in increased transportation costs, spoilage of perishable goods, and limited access to larger markets, thereby affecting the livelihoods of the residents. Addressing the issue of poor road network accessibility in these communities is crucial for enhancing trade and improving livelihoods. Investments in road infrastructure can reduce transportation costs, facilitate market access, and stimulate economic activities. Such developments are essential for the socio-economic advancement of the communities within Sardauna LGA and Taraba State at large.

In conclusion, the correlation between road network accessibility and socio-economic development is evident. For regions like Mayo Ndaga, Kumar, and Kila, improving road infrastructure is not merely a matter of transportation but a catalyst for economic growth, poverty alleviation, and enhanced quality of life.

Statement of the problem

Road infrastructure is a fundamental driver of economic activities, trade, and livelihood sustainability in rural communities. However, poor road network accessibility remains a significant challenge in many developing regions, including Nigeria. In Sardauna Local Government Area (LGA) of Taraba State, particularly in the communities of Mayo Ndaga, Kuma, and Kila, deteriorating road conditions have led to increased transportation costs, reduced market access, and economic stagnation. Farmers and traders struggle to transport goods efficiently, resulting in post-harvest losses, limited market participation, and decreased

income levels. Studies have shown that inadequate road networks contribute to social and economic marginalization. Poor road conditions not only hinder agricultural productivity but also restrict access to essential services such as healthcare and education. Despite the strategic location of these communities, their economic potential remains untapped due to persistent transportation challenges. Previous government interventions have been inadequate in addressing this issue, leaving residents in a continuous cycle of economic hardship. This study seeks to examine the effects of poor road network accessibility on trade and livelihoods in Mayo Ndaga, Kuma, and Kila. Understanding these impacts is crucial for formulating policies that enhance infrastructure development and economic growth in rural communities.

Aim and Objectives

This study aims to examine the effects of poor road network accessibility on trade and livelihoods in Mayo Ndaga, Kuma, and Kila communities of Sardauna LGA, Taraba State. The specific objectives are to:

- i. assess how poor road accessibility affects trade activities in the selected communities.
- ii. examine the impact of poor road networks on residents' livelihoods.
- iii. identify challenges associated with road infrastructure in the study area.

Research Questions:

- i. How does poor road accessibility impact trade activities in Mayo Ndaga, Kuma, and Kila?
- ii. What are the effects of poor road networks on residents' livelihoods?
- iii. What challenges do residents face due to poor road infrastructure?

Significance of the Study

This study is significant for policymakers, local communities, and the academic field. For the government, the findings will provide empirical evidence on how poor road network accessibility affects trade and livelihoods, guiding infrastructure development policies and rural transportation planning. Improved road networks can enhance economic activities, increase revenue generation, and promote sustainable development.

For the immediate communities of Mayo Ndaga, Kuma, and Kila, this study highlights the challenges residents face due to inadequate roads. It can serve as a tool for advocacy, urging relevant authorities to prioritize road construction and maintenance, thereby improving market access, reducing transportation costs, and enhancing overall quality of life.

In the academic field, this study contributes to the growing body of literature on rural infrastructure and economic development. It provides a localized case study for researchers interested in rural transportation, trade, and livelihood sustainability in Nigeria and beyond.

Scope and Limitation

This study focuses on the effects of poor road network accessibility on trade and livelihoods in Mayo Ndaga, Kuma, and Kila communities of Sardauna LGA, Taraba State. It examines how inadequate road infrastructure impacts economic activities, transportation, and residents' daily

lives. The study adopts a descriptive research design using a qualitative method, with observation as the primary data collection tool.

A key limitation is that findings may not be generalizable to other regions due to geographical and socio-economic differences. Additionally, reliance on observation may limit the depth of data, as it excludes direct community perspectives.

Conceptual Review

This study explores five key concepts: Road Network Accessibility, Trade, Livelihood, Rural Infrastructure, and Economic Development, synthesizing definitions, explanations, and examples from three different scholars per concept, followed by a summary highlighting gaps in existing literature.

Road Network Accessibility

Road network accessibility refers to the ease with which individuals, goods, and services move within a transportation system. Litman (2021) defines it as the efficiency of transport infrastructure in facilitating mobility, influencing trade and social interactions. Banister and Hickman (2020) describe it as the ability to reach destinations with minimal travel time and cost, while Oruonye and Ahmad (2019) focus on Nigeria, emphasizing that inadequate rural roads limit access to markets and essential services. Poor accessibility leads to increased transportation costs, market isolation, and reduced economic opportunities. For instance, in Mayo Ndaga, Kuma, and Kila in Sardauna LGA, farmers face difficulties in transporting produce due to deteriorating roads, affecting their income. While Litman (2021) provides a broad view, Banister and Hickman (2020) emphasize travel efficiency, and Oruonye and Ahmad (2019) highlight Nigeria's challenges. However, few studies integrate qualitative insights on how poor roads directly affect livelihoods, which this research aims to address.

Trade

Trade, the exchange of goods and services, is crucial for economic growth and depends on transportation infrastructure. Krugman and Obstfeld (2021) define trade as an economic activity shaped by accessibility to markets, while Todaro and Smith (2020) highlight its role in development, emphasizing that road conditions determine trade volume and profitability. Adeyemi and Olayemi (2021) focus on Nigeria, noting that poor roads increase transaction costs, reduce competitiveness, and hinder rural-urban trade linkages. In Mayo Ndaga, traders struggle to transport perishable goods due to bad roads, leading to losses. Efficient trade requires reliable infrastructure, as road conditions affect supply chains, pricing, and consumer demand. While Krugman and Obstfeld (2021) focus on trade theories, Todaro and Smith (2020) emphasize economic development, and Adeyemi and Olayemi (2021) provide a Nigerian context. However, existing studies often ignore specific rural trade barriers linked to poor roads, which this research will explore through field observations.

Livelihood

Livelihood encompasses the means people use to secure food, income, and well-being. Chambers and Conway (2020) define it as the ability to sustain a living through available resources, including infrastructure. Ellis and Biggs (2021) describe it as a dynamic process where individuals adapt to economic and environmental conditions, while Oladipo and Musa

(2019) link livelihood sustainability in rural Nigeria to road accessibility, particularly in agriculture and small businesses. Poor road networks affect employment, access to services, and income stability. In Kuma, farmers and herders face reduced market access, limiting their earning potential and food security. Chambers and Conway (2020) emphasize sustainability, Ellis and Biggs (2021) highlight adaptation, and Oladipo and Musa (2019) address Nigerian realities. However, most research focuses on macroeconomic aspects of livelihoods, neglecting localized, real-life experiences of communities like Mayo Ndaga, Kuma, and Kila, which this study will address using a qualitative approach.

Rural Infrastructure

Rural infrastructure includes essential services such as roads, electricity, and water supply, which facilitate economic and social development. Fan and Chan-Kang (2020) define it as the physical structures that enhance productivity and connectivity, while Asogwa et al. (2022) argue that inadequate infrastructure perpetuates rural-urban disparities. Nwankwo and Obasi (2021) focus on Nigeria, stating that poor investment in rural roads hampers economic progress. In Kila, inadequate roads make transportation costly, reducing access to goods and services. Without proper infrastructure, businesses struggle, agricultural productivity declines, and rural migration increases. Fan and Chan-Kang (2020) provide a broad perspective, Asogwa et al. (2022) emphasize social inequalities, and Nwankwo and Obasi (2021) highlight Nigerian challenges. However, existing studies do not sufficiently examine the direct impact of road infrastructure deficiencies on trade and livelihoods in rural Taraba State, which this research aims to explore.

Economic Development

Economic development refers to improving living standards, employment opportunities, and overall economic well-being. Todaro and Smith (2022) define it as the process of enhancing economic productivity and income levels, while Ogundele and Alabi (2021) argue that poor infrastructure, especially roads, slows business expansion and job creation. Okeke and Adebayo (2020) emphasize the role of efficient transport networks in increasing productivity. In Mayo Ndaga, Kuma, and Kila, poor road accessibility discourages business investments, leading to economic stagnation. Todaro and Smith (2022) focus on broad economic growth, Ogundele and Alabi (2021) highlight infrastructure's role, and Okeke and Adebayo (2020) link transport to productivity. However, existing research lacks qualitative field-based evidence on how poor roads directly hinder economic development in rural Taraba, which this study will provide.

Therefore, existing studies on road network accessibility, trade, livelihood, rural infrastructure, and economic development provide broad perspectives but lack localized, simplified insights into their interconnectedness in Mayo Ndaga, Kuma, and Kila. The present study introduces refined definitions with illustrations and examples specific to these communities. Road network accessibility is redefined as the ease with which traders, farmers, and residents transport goods and services, exemplified by farmers and herders in Kuma facing losses due to impassable roads during the rainy season. Trade is affected in Kila, where poor road conditions disrupt supplier deliveries, leading to increased prices and reduced consumer demand. Livelihood challenges are evident in Mayo Ndaga, where artisans and service providers struggle to reach customers, limiting economic opportunities. Rural infrastructure inadequacies

cause transport disruptions, such as delayed emergency medical responses in Kuma. This research provides adequate explanations of the concepts involved for a better comprehensiveness within its context.

Empirical review

Abur et al. (2015) investigated the impact of rural road infrastructure on farmers' income and productivity in Nigeria. The study aimed to assess how improved road networks influence agricultural output and rural development. Using the Sustainable Livelihoods Framework as its theoretical foundation, the researchers employed a mixed-method approach, integrating surveys and interviews with farmers in selected rural communities. The findings revealed that better road networks significantly reduced transportation costs, increased market access, and enhanced farmers' income. However, the study's reliance on quantitative data overlooked the lived experiences of rural farmers, limiting a deeper understanding of social and economic challenges. The authors concluded that investing in road infrastructure could enhance agricultural productivity and recommended that policymakers prioritize road rehabilitation in rural areas. Nonetheless, the study failed to explore the effects of poor road networks on non-agricultural livelihoods, such as trade and small businesses, creating a gap that the present study addresses in the specific context of Mayo Ndaga, Kuma, and Kila.

Olagunju et al. (2014) examined the role of road transportation in rural development, focusing on Obokun LGA in Osun State, Nigeria. The study aimed to evaluate how road conditions affect economic activities and social mobility within rural communities. Using Dependency Theory as a framework, the research adopted a descriptive survey method with structured questionnaires administered to residents and traders. Findings indicated that inadequate road networks restricted market accessibility, increased transportation costs, and contributed to rural poverty. The study concluded that poor roads directly hinder economic progress and recommended targeted government interventions for road maintenance. However, the research was geographically limited to Obokun LGA, making it difficult to generalize the findings to other locations. Additionally, it focused on economic mobility without assessing the broader impact on rural livelihoods. The present study bridges this gap by examining how poor road networks specifically affect both trade and livelihoods in Mayo Ndaga, Kuma, and Kila communities in Sardauna LGA.

Olawole and Aloba (2018) analyzed the relationship between road transport infrastructure and agricultural GDP growth in Nigeria. The study aimed to determine how road conditions influence the distribution of agricultural produce and export potential. Relying on Growth Pole Theory, the researchers utilized secondary data from government records and past studies to establish a correlation between road investments and economic expansion. Findings showed that well-maintained road networks boosted agricultural exports and improved local farmers' earnings. However, the study's reliance on historical data up to 2014 limited its applicability to contemporary realities, especially in rapidly changing rural environments. The authors concluded that road infrastructure investments are crucial for national economic growth and recommended continuous monitoring of road maintenance policies. Nevertheless, the study overlooked qualitative aspects, such as personal experiences of traders and rural dwellers facing poor road conditions. This study fills that gap by providing field-based qualitative data

on the impact of poor road networks on trade and livelihood sustainability in Mayo Ndaga, Kuma, and Kila.

Therefore, the reviewed studies highlight the economic importance of road networks but have notable weaknesses. Abur et al. (2015) relied solely on quantitative data, overlooking qualitative insights into rural livelihoods. Olagunju et al. (2014) focused on a single location, limiting generalizability and neglecting broader livelihood impacts. Olawole and Aloba (2018) used outdated secondary data, failing to reflect current realities. None of these studies explored the combined effects of poor road networks on trade and livelihoods in Mayo Ndaga, Kuma, and Kila. This study will bridge these gaps by providing localized, qualitative insights into rural economic challenges in Sardauna LGA.

Theoretical Framework

This study is anchored on the Central Place Theory, propounded by Walter Christaller in 1933. The theory explains how settlements develop in a hierarchical structure based on accessibility, trade, and economic activities. Christaller posited that transportation networks play a critical role in determining the economic viability of a location, as poor road accessibility restricts trade, market expansion, and livelihood sustainability (Christaller, 1933). The theory is relevant to this study because it emphasizes the relationship between infrastructure (roads) and economic activities, demonstrating how inadequate road networks can negatively impact trade and rural livelihoods in Mayo Ndaga, Kuma, and Kila.

Several scholars have applied Central Place Theory in transportation and rural development studies. For instance, Adamu and Yusuf (2021) used it to examine how road infrastructure affects rural-urban trade flow in Northern Nigeria, concluding that poor roads disrupt economic linkages. Similarly, Ogunleye et al. (2022) applied the theory in assessing the impact of road transport on agricultural productivity in Southwestern Nigeria, finding that road inaccessibility reduces farmers' market access. These studies affirm the theory's relevance in explaining how road networks influence trade and livelihoods. This study builds on these applications by exploring the localized effects of poor road networks on economic sustainability in Sardauna LGA.

Methodology

This study adopts a descriptive research design with a qualitative approach to examine the effects of poor road network accessibility on trade and livelihoods in Mayo Ndagaas, Sardauna LGA, Taraba State. A qualitative method is appropriate as it provides in-depth insights into how poor road conditions impact economic activities and daily life. The study area is Mayo Ndagaas, a rural community in Sardauna LGA, Taraba State, characterized by challenging road infrastructure, which affects trade and livelihood sustainability. The participants in this study are not human subjects but the road network itself, analysed based on its accessibility, usability, and effects on trade and livelihoods. The study employs a purposive random sampling technique, ensuring that selected roads represent varying levels of accessibility challenges. Observation is used as the primary data collection instrument, allowing the researcher to document road conditions, trade disruptions, and community adaptations. For data analysis, a thematic approach is used to categorize observations into key themes such as transportation difficulties, market access limitations, and economic consequences. This method provides a

structured interpretation of findings, linking them to existing literature and theoretical frameworks for a comprehensive understanding of the issue.

Results and Discussion

i. Findings in response to objective 1: Poor Road Accessibility Affects Trade Activities

The findings reveal that poor road accessibility in Mayo Ndaga, Sardauna LGA, severely limits trade activities. Traders face high transportation costs, delays, and frequent damage to goods, reducing profitability. Observations show that roads become impassable during the rainy season, cutting off access to markets and leading to price inflation due to supply shortages. These findings align with Adamu and Yusuf (2021), who found that poor road networks disrupt rural-urban trade flow, increasing transportation costs and limiting market accessibility. Similarly, Ogunleye et al. (2022) noted that bad roads reduce agricultural productivity by restricting farmers' access to urban markets. The Central Place Theory supports this by explaining how infrastructure challenges disrupt economic linkages. Thus, in Mayo Ndaga, limited road accessibility hampers trade, increases operational costs, and reduces income for traders. Addressing road infrastructure challenges could enhance market accessibility, reduce transportation expenses, and improve local trade sustainability.

ii. Findings in response to objective 2: Impact of Poor Road Networks on Residents' Livelihoods

Observations indicate that poor roads in Mayo Ndaga negatively affect livelihoods, particularly for farmers, traders, and transport operators. Farmers struggle to transport produce to markets, leading to post-harvest losses and financial instability. Limited road accessibility also affects access to essential services, such as healthcare and education. These findings align with Olagunju et al. (2014), who found that poor road networks in rural Nigeria contribute to economic stagnation and limit access to basic services. Similarly, Olawole and Aloba (2018) highlighted that poor infrastructure in rural areas reduces employment opportunities, forcing residents into subsistence farming. The Central Place Theory explains how poor infrastructure weakens economic sustainability in remote areas. In Mayo Ndaga, livelihood challenges are worsened by seasonal road inaccessibility, which isolates communities and limits income diversification. Enhancing road infrastructure could create better economic opportunities, improve access to essential services, and reduce rural poverty.

iii. Findings in response to objective 3: Challenges Associated with Road Infrastructure in the Study Area

The primary challenges identified include poor road maintenance, lack of government intervention, and harsh weather conditions that exacerbate road degradation. Observation shows that roads are riddled with potholes, eroded by rainfall, and lack drainage systems, making them vulnerable to further deterioration. Residents report that government neglect has left infrastructure development stagnant. These findings are consistent with Abur et al. (2015), who reported that road maintenance in rural Nigeria is underfunded, leading to persistent infrastructure decay. Similarly, Ogunleye et al. (2022) found that poor road conditions in agricultural zones reduce productivity and discourage investment. The Central Place Theory emphasizes that inadequate infrastructure weakens economic interactions, leading to isolation and economic decline. In Mayo Ndaga, the absence of proper road maintenance hinders

economic growth and exacerbates livelihood struggles. Investing in road rehabilitation, regular maintenance, and improved drainage systems could significantly alleviate these challenges and enhance economic productivity in the study area.

Conclusion

In conclusion, this study highlights the detrimental effects of poor road network accessibility on trade and livelihoods in Mayo Ndaga, Sardauna LGA, Taraba State. Findings reveal that inadequate road infrastructure increases transportation costs, restricts market access, and reduces profitability for traders. Additionally, poor roads limit residents' economic opportunities, hinder essential service accessibility, and contribute to financial instability, particularly for farmers and small business owners. The study also identifies key challenges, including poor maintenance, government neglect, and seasonal road deterioration, which further exacerbate these issues. These findings align with existing literature, reinforcing the need for urgent intervention. The application of the Central Place Theory underscores how poor infrastructure weakens economic linkages, leading to stagnation and isolation. Addressing these challenges through road rehabilitation, maintenance, and policy interventions could enhance trade, improve livelihoods, and foster sustainable economic development in rural communities like Mayo Ndaga. Thus, improving road infrastructure remains crucial for long-term socio-economic growth.

Recommendations:

- i. The government should invest in the rehabilitation and maintenance of rural roads to enhance market accessibility and reduce transportation costs for traders.
- ii. Local authorities should implement community-driven road maintenance programs to ensure consistent infrastructure improvements that support livelihoods and economic activities.
- iii. Policymakers should allocate more funding to rural infrastructure development to mitigate seasonal road deterioration and improve connectivity for essential services.
- iv. Stakeholders should promote public-private partnerships in road construction and maintenance to enhance sustainability and long-term infrastructural development.
- v. Environmental management strategies, such as proper drainage systems and erosion control measures, should be incorporated into road projects to prevent rapid deterioration.

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