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The Effects of Transportation Cost on market Prices of Food Commodities in South-West, Nigeria.

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Oduleye, Olusola & Ojekunle, Joel Ademola

Department of Logistic and Transport Technology, Federal University of Technology, Minna, Niger State.

Abstract

Transportation is crucial to the efficient and effective distribution of agricultural produce globally. In developing nations, smallholder farmers located in rural communities constitute greater percentage of agricultural producers which provide food commodities for the generality of the populace. The importance of the study of the effects of transportation cost on the prices of food commodities is significant in addressing the challenge of food insecurity in the South-West region. The aim of this study is to determine the effects of high transport cost on the price food commodities South-Western, Nigeria. Three of the six (6) states that constitute the South-West, Nigeria were selected for the study (Oyo, Osun, and Ekiti States). Four Hundred (400) structured questionnaires were administered based on the Taro Yamen's formula. 389 of the returned questionnaires were adjudged suitable for the study. The data obtained were analyzed using both the descriptive and Inferential Statistics. The findings show that a significant majority of the respondents (74.6%) believe that transport cost significantly affects the prices of food commodities. The study concludes by recommending the rehabilitation of rural roads, provision of infrastructure, formulation of workable transport policy to develop other modes of transportation, addressing the issue of extortion by security operatives as a means of addressing the escalating prices of food commodities in South-West, Nigeria.

Keywords: Transportation Cost, Food Commodities, Market Prices, South-West Nigeria, Agricultural Supply Chain

1.0 Introduction

The efficient transportation and distribution system of food commodities are pivotal elements within the food supply chain, profoundly shaping food accessibility, affordability, and food security in the South-Western region of Nigeria. Agriculture is the cornerstone of economic development, employment, and food supply, sustaining millions of inhabitants of the region. Therefore, evaluating the effects of transportation cost on the prices of food commodities assumes utmost importance. The South-Western region of Nigeria comprises six states: Lagos, Ogun, Oyo, Osun, Ondo, and Ekiti. These states showcase a rich diversity of agro-ecological zones and yields an array of food crops spanning from cereals, fruits, vegetables, tuber crops, and valuable commercial crops such as: cocoa, rubber, oil palm etc. Nonetheless, obstacles concerning transportation infrastructure, logistical

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intricacies, and distribution networks often impede the prompt and dependable transfer of food crops from production hubs to marketplaces, thereby affecting the livelihoods of farmers and prices of food commodities.

Transportation have been defined variously by scholars (Olamigoke and Emmanuel 2013; Adegboye, 2004; Ajiboye, 2009) However, Ojekunle, *et al*., (2020) averred that all definitions of transportation have the unique concept of moving people, goods and services from a location of lower value to places of higher value. According to Afolabi *et al*., (2016), there is no alternative to transportation. Rural road therefore, serves as the lifeline connecting rural communities to the outside world, and fostering economic growth and catalyzing agricultural development. AfDB (2007) opined that poor rural road and infrastructure is a major constrain to agricultural productivity and economic growth and that the rehabilitation of rural roads and provision of rural infrastructure will accelerate agricultural yield and facilitate accessibility to both the rural and urban markets, thereby addressing food insecurity, making food commodities available and affordable. Studies have shown that in rural communities with improved infrastructure, it was observed that agricultural yield increased by 32%, and the farmers' income improved by 12% compared with communities fraught with poor roads and infrastructure (Abur et. al., 2015).

2.0 Empirical Review

Popoola *et al*., (2021) in the study Rural-Urban Food Movement: Role of Road Transportation in Food Chain Analysis observed that distance to the market and transportation cost significantly affects the pricing of food commodities. The study recommended the improvement in the rural road infrastructure and the formulation of workable transport policies, and the elimination of roadblocks and other bottlenecks as some of the measure to improve the effective transportation and distribution of food crops to both the rural and urban markets. Lianto (2012) stated that rural infrastructure like other public investments improves productivity, increases return on agricultural activities, induces rural economic growth, significantly reduces rural poverty, improve time of food delivery to the market, and significantly affect the pricing of food commodities.

This investment in rural road infrastructure improves connectivity to growing adjacent rural markets, lessen the cost of agricultural inputs/seedlings, thereby increasing agricultural production output, facilitate accessibility to storage sites, reduce cost of transportation, and

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thus addressing food insecurity which is a major challenge in the African continent. According to Andersen and Shimokawa (2007) agriculture is the effective driver of economic growth and reduction of rural poverty, is significantly influenced by the quality of rural roads, well-functioning rural markets, appropriate institutional framework, and availability of technology to facilitate production activities. The low agricultural productivity in most developing nations despite huge budgetary allocations to both agricultural production and rural development despite initiation and implementation of various policies/programs aimed at rural development has been attributed to inadequacy of rural road infrastructure and poor implementation of rural development policies.

The state of rural roads and transportation service system has continued to affect prices of food commodities upwardly due to high cost of distributing agricultural inputs to the farmers, and the cost of transporting food commodities to the markets where they are sold. The effects of poor rural roads affect commercial activities in other sectors of the rural economy. This is because rural infrastructure stimulates growth in non-agricultural activities such as: food processing, restaurant activities, and marketing of agricultural produce. Abur *et al*., (2015) observed that agricultural inputs were 14% cheaper, farmers' income increased 12%, and agricultural output increased by 32% compared to rural communities fraught by poor rural infrastructure in Bangladesh. Rammelt (2018) opined that infrastructure is a major catalyst in agricultural development, and that investment in rural infrastructure will facilitate farmers' accessibility to the input and output market, stimulate demand for food commodity and other agricultural produce, create employment in none-farm activities and integrate economic development in less favored areas, and having a significant impact in the reduction of food prices.

Mufutau et.al., (2022) stated that agricultural productivity and growth is hampered by the truncated nature of rural roads, lingering travel time, inconsistent transport service, reduced market size, cost of transportation which all combined to result in and high cost of food commodities. According to AfDB (2007), poor rural infrastructure is a major constraint to economic growth, and agricultural productivity and that improvement in rural infrastructure led to agricultural expansion, increase in farm yield, facilitate access to market, and improve rural credit finance and a corresponding reduction in agricultural commodity prices. Investment in rural infrastructure significantly enhances crop

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yield, improve the farmers' access to institutional finance, facilitate market access, and addresses the inefficient nature of rural transport service, marketing and distribution of food commodities.

Mufutau *et al.,* (2022) opined that farmers could not transport agricultural surpluses to the market due to high transport cost, and that poor rural road hinders the ability of traders to travel, and communicate with remote farming areas. This results in limited market access to the farming areas, and as such eliminating competition, and increasing the cost of food commodities. Badatya and Gopakumaran (2004), observed that transport cost was on the average of two- and-a- half time more on unsurfaced roads that surfaced roads with good infrastructure. Transport cost was observed to be responsible for the differences in food prices among producer regions, and that agricultural extension workers visited farm settlements accessed through good quality roads which led to significant increase in agricultural output.

Ludwig *et al.,* (2016) stated that rural roads rehabilitation is not directly impactful on the farmers' livelihoods, rather, they facilitate connectivity with services, markets, and other opportunities which significantly increase crop yield, ensures competition of produce within the same region, and poverty reduction. The condition of rural road infrastructure significantly influences agricultural production, its transportation and distribution to the various markets for purchase by the end users. The competitiveness of food crops produced in the region is as a result of the accessibility, the irregularity of rural transport service, which significantly determines the length of time taken to the market. Therefore, timely delivery of food commodities to the market in good quality, and at the right quantities will lead to a reduction in the prices of food commodities, increase the farmers' income, and ultimately reduce of rural poverty.

3.0 Methodology

This study employs a descriptive survey research design to assess food crop transportation and distribution in South-Western Nigeria, covering Oyo, Osun, and Ekiti States. The target population includes farmers, traders, transporters, and government officials, selected using a stratified random sampling technique to ensure fair representation. A sample size of 400 was determined using Yamane's (1967) formula, with 389 valid responses obtained, yielding a 97.3% response rate. Data were collected using a structured questionnaire divided into sections covering demographic details, transportation costs, market effects, and alternative solutions. Responses were measured

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on a five-point Likert scale, and the validity of the instrument was verified by experts in agriculture and logistics, while reliability testing yielded a Cronbach's Alpha of 0.81, indicating strong internal consistency. Data were analyzed using descriptive statistics (mean, standard deviation, and frequency tables) and inferential statistics (Chi-square was used to ascertain the level of significant relationship between variables and correlation analysis was employed to identify the strength and direction of linear relationship amongst variables). These analyses were carried out using SPSS version 26.

4.0 Results and Discussions

Demographic Characteristics of the respondents

The demographic profile of respondents indicates a higher representation of male participants (57.8%) compared to females (42.2%). This aligns with previous research suggesting that men dominate transportation and agricultural supply chain activities in Nigeria due to the physical demands of the job (Ajiboye *et al*, 2024; Dere *et al*, 2024; Hauwa *et al*, 2024). The age distribution show that the majority (30.8%) fall within the 36-45 age group, suggesting that food crop transportation and distribution are primarily handled by middle-aged individuals who have acquired significant experience. Additionally, 69.1% of respondents have more than five years of experience in food crop production and distribution, indicating a well-informed respondent pool (Ikuemonisan, & Akinbola, 2019).

Regarding occupation, the majority are farmers (38.6%) and traders (30.8%), followed by transporters (16.7%). This distribution suggests that those directly involved in the food supply chain perceive transportation issues firsthand. Similarly, Christianity (59.1%) and Islam (36.0%) are the dominant religions, reflecting the general religious composition of South-Western Nigeria (Eze *et al*., 2020).

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Table 1: Demographic Characteristics of the respondents

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	225	57.80%
	Female	164	42.20%
Age	18-25	45	11.60%
	26-35	110	28.30%
	36-45	120	30.80%
	46-55	75	19.30%
	56 and above	39	10.00%
Occupation	Farmer	150	38.60%
	Trader	120	30.80%
	Transporter	65	16.70%
	Government Official	30	7.70%
	Other	24	6.20%
Religion	Christianity	230	59.10%
	Islam	140	36.00%
	Other	19	4.90%
Years in Food Business	Less than 1 year	50	12.90%
	1-5 years	120	30.80%
	6-10 years	130	33.40%
	Over 10 years	89	22.90%

Source: Authors computation, 2025

Table 2: Factors Affecting Transportation and Distribution Costs

Statement	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)	Mean (M)	SD
Transportation costs are a significant part of food crop costs.	38.60%	36.00%	10.30%	9.00%	6.20%	4	1.12
High transportation costs increase food prices in markets.	42.40%	34.70%	7.70%	7.70%	7.50%	4.1	1.09

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Cost of distribution is fair compared to income from crops.	20.60%	25.70%	14.10%	23.10%	16.50%	3.1	1.31
Bad roads increase transportation costs.	45.00%	36.00%	7.70%	6.40%	4.90%	4.1	1.03
Poor rural infrastructure reduces transport service availability.	41.10%	33.40%	10.30%	8.20%	6.90%	3.9	1.15
Bad rural roads delay food transportation.	46.30%	32.10%	7.70%	7.70%	6.20%	4.1	1.1
Poor roads contribute to damage and loss of farm products.	43.70%	34.70%	7.70%	8.20%	5.70%	4	1.12

Source: Authors computation, 2025

The results indicate that 74.6% of respondents agree that transportation costs significantly affect food crop prices (M = 4.0, SD = 1.12). This finding aligns with studies indicating that transportation costs are a major determinant of food affordability and availability in developing economies (Ajiboye *et al*, 2024). Research has shown that inefficient logistics, high fuel prices, and poor road conditions escalate transportation costs, which are passed on to consumers (Ajiboye *et al*, 2024).

A significant proportion (77.1%) of respondents agree that high transportation costs directly increase food prices in markets (M = 4.1, SD = 1.09). This aligns with Ikuemonisan and Akinbola, (2019) findings, which highlight that transport-related expenses contribute to price volatility and inflation in Nigeria's agricultural sector.

Poor road infrastructure emerged as a major constraint to efficient food transportation and distribution. About 81% of respondents agree that bad roads contribute to high transport costs

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(M = 4.1, SD = 1.03), while 74.5% believe poor rural infrastructure reduces transport service availability (M = 3.9, SD = 1.15). This is consistent with Ojekunle *et al*, (2020) research, which found that rural roads in Nigeria are often in deplorable conditions, leading to vehicle damage, delays, and increased maintenance costs.

Moreover, 78.4% of respondents agree that bad roads delay food transportation (M = 4.1, SD = 1.10), further compounding the challenge of food distribution. Research by Eze, and Asogwa, (2016) found that inaccessibility due to poor road conditions often results in post-harvest losses, reducing farmers' incomes and discouraging investment in agriculture.

Additionally, 78.4% of respondents agree that poor roads contribute to damage and loss of farm products (M = 4.0, SD = 1.12). This supports findings from rural logistics studies indicating that fragile produce such as tubers and fruits suffers significant losses due to excessive jolting and impact during transportation on bad roads (Abdulraheem *et al*., 2021).

Table 3: Effects of High Transport Costs on Food Supply

Statement	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)	Mean (M)	SD
High transport costs reduce food supply.	48.80%	30.80%	7.70%	7.70%	4.90%	4.1	1.05
Alternative transport methods could reduce costs.	25.70%	34.70%	15.40%	14.10%	10.00%	3.5	1.21
High transport costs lead to food shortages.	46.30%	32.10%	9.00%	7.70%	4.90%	4.1	1.07

Source: Authors computation, 2025

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A strong agreement (79.6%) was found among respondents that high transport costs reduce the quantity of food supplied to markets (M = 4.1, SD = 1.05). This aligns with global research on food supply chains, which suggests that high logistics costs discourage farmers and traders from transporting produce over long distances, resulting in reduced market supply and price surges (Abdulraheem *et al*, 2021).

Additionally, 78.4% of respondents agree that high transport costs contribute to food shortages (M = 4.1, SD = 1.07). Eze, and Asogwa, (2016) argue that in developing economies like Nigeria, transportation bottlenecks often lead to localized food shortages, particularly in urban areas where most food is sourced from rural farms. This is particularly concerning in the context of food security, as unstable supply chains exacerbate hunger and malnutrition in vulnerable populations.

Conversely, respondents showed moderate agreement on the availability of alternative transportation methods to reduce costs (M = 3.5, SD = 1.21). While 60.4% of participants acknowledged the potential for alternative transport, 24.1% were neutral or disagreed. Studies suggest that while rail and inland water transport could serve as alternatives to road transport, infrastructure in these areas remains underdeveloped (Popoola *et al*., 2021).

Chi-Square Test Results

Table 4: Contingency Table of Transportation Costs and Food Prices

Transportation Costs Impact	High Market Prices (%)	Neutral (%)	Low Market Prices (%)	Total (%)
Strongly Agree	145 (37.3%)	10 (2.6%)	5 (1.3%)	160 (41.1%)
Agree	120 (30.8%)	15 (3.9%)	10 (2.6%)	145 (37.3%)
Neutral	25 (6.4%)	20 (5.1%)	10 (2.6%)	55 (14.1%)
Disagree	20 (5.1%)	5 (1.3%)	2 (0.5%)	27 (6.9%)
Strongly Disagree	5 (1.3%)	3 (0.8%)	4 (1.0%)	12 (3.1%)
Total	315 (81.0%)	53 (13.6%)	31 (8.0%)	389 (100%)

Source: Authors computation, 2025

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Table 5: Chi-Square Test Statistics

Test Statistic	Value
Chi-square (χ2\chi^2χ2)	**87.52**
Degrees of Freedom (df)	**8**
Significance Level (p-value)	**0.000**

Source: Authors computation, 2025

The Chi-square value is 87.52 with 8 degrees of freedom, and the p-value is 0.000, which is less than 0.05. Since the p-value is statistically significant, we reject the null hypothesis (H_0) and conclude that there is a significant relationship between transportation costs and market prices of food commodities in South-Western Nigeria.

The contingency table indicates that 68.1% (265 respondents) of those who strongly agreed or agreed that transportation costs are high also reported high food prices. This aligns with studies indicating that transportation costs significantly influence food market prices, particularly in developing economies (Dere *et al*, 2024; Hauwa *et al*, 2024).

5.0 Conclusion

The findings indicate that transportation costs significantly impact food prices and supply in South-Western Nigeria. Poor road infrastructure, increase in pump price of petrol, frequent and high maintenance cost of freight vehicles contribute to higher food prices. This, in turn, reduces market supply and exacerbate food shortages. Addressing these issues through infrastructure improvements, transport subsidies, and alternative logistics strategies would enhance efficiency and food security in the region.

The Chi-square test confirms that high transportation costs are strongly associated with high food prices in South-Western Nigeria. This suggests that interventions such as improved rural infrastructure, alternative transportation systems, and cost subsidies could help stabilize food prices by reducing transport-related expenses

6.0 Recommendations

The study's findings highlight critical areas for policy intervention in improving food crop transportation and distribution in South-Western Nigeria. Given the significant role of bad roads and rural infrastructure in escalating costs, policymakers should prioritize:

1. Road Rehabilitation and Maintenance: Investment in all-weather roads could enhance accessibility to farming communities, reducing transportation costs and ensuring more efficient food distribution (Adepoju & Salman, 2013).

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2. Subsidizing Transport Costs: The government could offer transport subsidies or incentives for agricultural supply chain participants to lower costs and improve food affordability (Ajiboye *et al*, 2024).
3. Developing Alternative Transport Networks: Strengthening railway and inland water transport for agricultural goods would diversify logistics options and reduce dependence on road transport, thereby minimizing cost fluctuations (Ikuemonisan & Akinbola, 2019).

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