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Impact of Road Transportation on Crop Marketing in Akoko South West Local Government Area, Ondo State, Nigeria

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A B S T R A C T

The study examined the impact of road transportation on crop marketing in Akoko South West Local Government Area, Ondo State. A two-stage sampling procedure was used to select a total of 120 farmers (crop producers) for the study. Well-structured and validated questionnaire/interview schedule was used to obtain information from the respondents. Findings from the study revealed that the major crops transported for marketing were plantain (92.5%), banana (91.7%, yam (73.3%), maize (72.5%), and cocoa (65%). The most commonly used road types for transportation were footpaths, feeder roads, and tarred roads. Respondents perceived that the level of transportation system can cause a reduction in farmers' income ($\bar{x}$= 3.12) and that the mode of transportation system can lead to crop damage ($\bar{x}$=2.83). Results of chi-square analysis also showed that out of the major crops, maize, orange, and cashew nut had a significant relationship with respondents' perceptions of the impact of road transportation on marketing of these farm produce (P≤0.05). Constraints faced by respondents in transportation of major crops include high fuel cost ($\bar{x}$=3.50), distance from farm to the market ($\bar{x}$=3.40), high labour cost ($\bar{x}$=3.35), high transportation cost ($\bar{x}$=3.30), and poor road network ($\bar{x}$=3.13). The study therefore recommended improvement of road networks and transportation facilities, promotion of extension services, and promotion of alternative modes of transportation to reduce transportation costs incurred by the crop producers.

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INTRODUCTION

The development of a nation is incomplete without infrastructural and social amenities such as construction and maintenance of roads, bridges, schools, electricity, water, and food both in the cities, towns, and villages (Olagunju, Ayinde, Adewumi & Adesiji, 2012). Similarly, transportation is critical to the development of rural communities, both in agricultural and non-agricultural sectors, due to the role it plays in production processes in these areas. It is an integral part of agricultural development that must not be overlooked. It eases the movement of produce from the farm to various consumption destinations and aids the movement of inputs into farms. For any development to take place in the agricultural sector, transportation must be given the desired attention it deserves. Availability of transport facilities is an important investment that stimulates economic growth through increased accessibility and mobility (Tunde and Adeniyi, 2012). Moreover, transport plays an important role in the political, economic, and social development of any society, both in rural and urban societies (Aderamo and Magaji, 2010). Its efficiency is critical to agricultural marketing and development. Rural transport service is the only means by which food produced at farm sites, which are often in rural areas, is moved to the market. Inefficient transportation in terms of rarity, poor quality, or expense is often to the disadvantage of the farmers as it leads to lower quality of produce and increases the cost of production and losses due to spoilage that occur during transportation to market. Worthy of note is that the road network in Nigeria and other developing countries is still in a poor state, which has resulted in excessive time and effort spent by rural area households' farmers on transportation activities to meet basic needs. Road transportation network system is therefore an essential requirement for rural development, although it is by itself not sufficient to guarantee a form of success in farming activity in the rural environment (Ale, 2014). Marketing is an integral part of agricultural production; it involves the storage, transportation, and delivery of agricultural produce. In developing countries like Nigeria, distance to markets, the lack of accessible roads, and high transport costs are central concerns for rural farmers. These rural farmers need access to competitive markets not just for their produce but also for inputs, assets, technology, consumer goods, credit, and labour.

Statement of Problem

Worthy of note is that road transport plays a pivotal role in the process of crop marketing in Sub-Saharan African countries by linking rural agricultural producers to urban markets and facilitating the movement of goods along the agricultural value chain. However, many rural areas in Nigeria where crops are produced are often linked to the major cities through poor or bad local roads. The poor road conditions, high transport costs, and distant markets have been identified as factors that can hamper improved market access for emerging farmers in rural areas (Makhura & Mokoena, 2003; Groenewald & Nieuwoudt, 2003; Sanyu, 2024). Factors that determine access to farm inputs and marketing of farm produce include: distance to the markets, the state of the roads, the cost of transportation, and the frequency of visits to these markets. The poor state of the roads, apart from having undesirable effects on

passengers, goods and traffic flow, also results in substantial loss of perishable agricultural produce, high cost of moving agricultural produce and other products, and exorbitant cost of vehicle maintenance. All these culminate in the high cost of transport, which hurts the income of the farmers. This study, therefore, investigated the effect of road transportation on the marketing of major crops among farmers in the study area by providing answers to the following research objectives: i. indicate the major crops transported for marketing ii. Identify the type of roads and means of transportation available for the farmers in marketing their major crops; iii. determine farmers' perception of road transportation on the marketing of their major crops; and v. identify the constraints to the transportation of the major crops in the study area. It was hypothesized that there is no significant relationship between the major crops transported and respondents' perception on the marketing of the crops.

LITERATURE REVIEW

According to Tunde and Adeniyi (2012) in agriculture, transport is the engine behind market formation most especially in the rural settlements, and also contributed immensely in connecting socio-cultural and geographical areas for economic activities as a good transportation system does not only provide cheap access to market for agricultural products but significantly reduce the cost of the products, and as well create sustainable livelihood to the people. In this vein, Sanyu (2024) averred that the efficient marketing of agricultural products is crucial for enhancing food security, promoting economic development, and alleviating poverty, particularly in developing countries like Nigeria. Although there are various forms of transportation, such as rail, water, and air, road transportation has been the most viable for agriculture in Nigeria, because it is highly flexible, operationally suitable, and readily available for the movement of goods and passengers over short, medium, and long distances. According to the World Bank (2007), road improvements in Nigeria have been associated with increased productivity and improvement in quality of life, given that they aid the movement of agricultural and non-agricultural commodities as well as ensuring the personal mobility of rural household members. The major crops transported for marketing of agricultural produce can vary based on location, season, and demand. According to the Food and Agriculture Organization Report (2021), the top traded agricultural commodities in terms of value are grains. The most commonly traded grains include wheat, corn, and rice. These grains are used for various purposes, such as human consumption, animal feed, and biofuel production. According to the United States Department of Agriculture (USDA), the top exporters of grains in 2020 were the United States, Russia, and Canada. The top importers were China, Mexico, and Egypt (United States Department of Agriculture, 2021). Oilseeds and vegetable oils are another major crop transported for marketing. Soybeans are the most commonly traded oilseed, followed by canola and palm oil. These commodities are used for various purposes, such as food production, animal feed, and biofuel production. According to the USDA, the top exporters

of oilseeds and vegetable oils in 2020 were Brazil, the United States, and Argentina. The top importers were China, the European Union, and India. (United States Department of Agriculture, 2021). Fresh fruits and vegetables are perishable commodities that require careful transportation and handling to maintain their quality. Some of the most commonly traded fruits and vegetables include apples, oranges, tomatoes, and potatoes. These commodities are used for human consumption and are also processed into various products, such as juices and sauces. Moreover, FAO (2021) reported that the top exporters of fruits and vegetables in 2020 were Spain, the Netherlands, and Mexico. The top importers were the United States, Germany, and the United Kingdom. Livestock, including cattle, pigs, and poultry, are transported for marketing primarily for meat production. These commodities require special transportation and handling to ensure their welfare and quality. The top exporters of beef in 2020 were Brazil, Australia, and the United States. The top importers were the United States, China, and Japan. The top exporters of pork were the European Union, the United States, and Canada, while the top importers were China, Japan, and Mexico. (United States Department of Agriculture, 2021) Sugar and sweeteners, including cane sugar, beet sugar, and corn syrup, are used in various food and beverage products. These commodities require special transportation and storage to prevent spoilage and degradation. According to the USDA (2021) top exporters of sugar in 2020 were Brazil, Thailand, and the European Union. The top importers were Indonesia, China, and the United States. However, inadequate transportation infrastructure, poor road conditions, and logistical challenges often impede the smooth flow of agricultural products, leading to increased post-harvest losses, reduced market access, and lower profitability for farmers (Sanyu, 2024).

METHODOLOGY

The study was carried out in Akoko Southwest Local Government Area, which is situated in Ondo State. It lies approximately between latitude 7○ 26′51″ N and longitude 5○ 37′ 13″ E of the equator. Its headquarters is in the town of Oke-oka, consisting of 15 communities, which are: Akungba, Supare, Oka, Ayegunle, Oba, Ikun, Okia, Korowa, Ikese, Iwonrin, Ebo, Owalusin, Ayepe, Okela, and Bolorunduro. It has an area of 226km and a population of 229,486 (National population commission, 2006). The local government is bounded to the north by Akoko North-East Local Government Area, by Ose and Owo Local Government areas to the south, and to the west by Ekiti State. The farmers in the state grow food crops and cash crops for both domestic consumption and export. These include cocoa, cashew, cassava, rice, palm produce, coffee, yams, timber, citrus, plantain, soya beans, cowpea, and kolanut. Cocoa is still the major cash crop of the state as bout 60% of the nation's output is produced in Ondo State (IITA, 2007). The target population for this study comprised all crop producers (farmers) in Akoko Southwest Local Government Area, Ondo State, Nigeria. A two-stage sampling procedure was adopted for this study. The first stage involved purposive selection of 12 communities that have major markets and where farming is dominant in the

study area, which comprises Supare, Oka, Akungba, Ayegunle, Oba, Ikun, Okia, Korowa, Ikese, Iwonrin, Ebo, and Owalusin. While the second stage involved the random selection of twelve (12) agricultural producers from each of the selected communities, to make a total of (120) respondents for the study area. The primary source of data was used to collect data from the field. Data were collected through the use of a well-structured questionnaire/interview schedule. More information was also gathered from secondary sources, including desk review, magazines, the internet, textbooks, and journals.

Measurement of Variables

1. Independent Variables
   a. Major crops transported for marketing: respondents were asked to tick the major crops transported in the study area as: Cocoa ( ), Yam ( ), Maize ( ), Cassava ( ), Plantain ( ), Banana ( ), and any other crops…….
   b. Types of Roads and Means of Transportation available for Marketing of Major Crops: respondents were asked to tick as appropriate the types of roads and means of transportation used for conveying their farm produce as: Foot path ( ) Feeder road ( ) Tarred road ( ) Untarred road ( ) Gravel surface ( ) while the means of transportation was measured as: Motorcycle ( ) Bicycle ( ) Taxi minibus ( ) Truck ( ) Pickup van ( ) Hilux ()
   c. Level of accessibility on the type of road: respondent answered based on three rating scale. High accessibility (3), low accessibility (2), no accessibility (1)
   d. Constraints to the transportation of major crops: Respondents were asked to indicate the constraints and rate them on a three-point scale as: serious constraint, minor constraint, and not a constraint.
2. Dependent Variable

Respondents' perception on the marketing of agricultural produce: This was assessed by asking the respondents to indicate their opinion on a scale containing 10 items and their responses captured on a 5-point Likert scale of SA (Strongly Agreed), A (Agreed), U (Undecided), D (Disagreed) and SD (Strongly Disagreed), and scored as 5, 4, 3, 2, and 1 respectively for positive statements, and 1, 2, 3, 4, and 5 for negative statements.

Validity and Reliability of the Research Instrument

The research instrument was subjected to face validity by experts in the field of agricultural extension and community development. Test test-retest method was used to determine the reliability of the instrument by administering the instrument to 20% of the sample size outside the area of study but with similar characteristics within an interval of two weeks to obtain the r-value using Pearson's Product-Moment Correlation (PPMC). The r-value was 0.76, and this indicated a high level of reliability. The consent of the respondents was sought, and research ethics of voluntary participation, anonymity, and confidentiality were followed.

Method of Data Analysis

The data collected were coded and analysed using SPSS version 24. Descriptive statistics such as frequency counts, mean, and percentages were

used for the objectives, while inferential statistics (Chi-square) were used to test the stated hypothesis.

RESULT AND DISCUSSION

Major Crops Transported by the Respondents

Results in Table 1 show the distribution of major crops transported in the study area. The major crops transported were plantain, banana, yam, maize, cocoa, cassava, orange, cashew nut, and cowpea. Plantain (92.5%) was ranked 1st among the major crops transported, followed by Banana (91.7%), which was ranked 2nd. Other crops: Yam, maize, and cassava ranked 3rd, 4th, and 5th, respectively. This result may be due to the high demand for plantain and banana, and also the continuity of production for seven years, which is later supplemented by their suckers. This result is in line with Tunde and Adeniyi (2012), whose findings indicated that the major crops grown and marketed in the study area were yams, maize, and cassava. These crops are categorized under tuber crops of which are staple foods mostly consumed by Nigerians.

Table 1. Major Crops Transported by the Respondents

Types of Crops	**Frequency**	**Percentage**	Rank
Plantain	111	92.5	1st
Banana	110	91.7	2nd
Yam	88	73.3	3rd
Maize	87	72.5	4th
Cocoa	78	65.0	5th
Cassava	67	55.8	6th
Orange	52	43.3	7th
Cashew nut	3	2.5	8th
Cowpea	1	0.8	9th

Source: Field Survey, 2024

Types of Roads and Means of Transportation Available for Marketing of Major Crops

Results in Table 2 show the distribution of respondents based on the types of roads available for marketing major crops in the study area. The majority (100.0%) of the respondents make use of footpaths as the type of roads used for marketing of major crops. This result implies that there is a long distance between the farm and where marketing activities take place in the study area. Feeder roads (42.5%) were second to the foot path road, the farmers (38.3%) also make use of tarred roads for marketing of major crops, followed by untarred roads (0.8%) and gravel surface, which is the least type of road used for marketing major crops in the study area. This result corroborates the findings of Ijeoma et al. (2014), whose results indicated that farmers make use of foot paths, tarred roads, and untarred roads for marketing major crops.

Table 2. Distribution of Respondents Based on Types of Roads Available for Marketing of Major Crops

Type of Road	**Frequency**	**Percentage**
Footpath/Farm track	120	100.0
Feeder road	51	42.5

Tarred road	46	38.3
Untarred road	1	0.8
Gravel surface	21	17.5

Respondents' Means of Transportation

Results in Table 3 show the distribution of respondents' mode of transportation for the marketing of major crops. The majority (80.8%) of the respondents frequently make use of taxi-mini buses to transport farm produce to market because they have enough carriage space to transport abundant produce at affordable costs. This result further supports the findings of Morgan (2019), who indicated that taxi/minibus was the most frequent mode of transporting farm produce from the farm to the market in Kasena-Nankana West District of Ghana. Moreover, many (77.5%) of the respondents used motorcycles as their primary mode of transportation for marketing major crops, followed by the use of taxi minibuses. This variation in transportation could be attributed to the distance between farms and markets in different communities. Studies have reported a significant increase in motorcycle use worldwide due to the availability of cheap Chinese motorcycles, which are suitable for navigating bad roads and provide a timely transport service. (Kassali et al., 2012; Starkey, 2016) Additionally, the results showed that 44.2% of respondents used pick-up vans, 35% used Hilux vehicles, and 20.8% used trucks, with some farmers owning and hiring their trucks. Only a small proportion (1.7%) of respondents used bicycles for transportation. These findings suggest that farmers in the study area have access to a diverse range of transportation options, and their choice of mode of transportation depends on various factors, such as distance, availability, and cost-effectiveness.

Table 3. Distribution of Respondents' Means of Transportation

Transportation mode	**Not at all**		**Once in a while**		**Frequently**	
	Frequency	%	**Frequency**	%	**Frequency**	%
Motorcycle (Okada)	4	3.3	23	19.2	93	77.5
Bicycle	1	0.8	117	97.5	2	1.7
Taxi minibus	17	14.2	6	5.0	97	80.8
Truck	39	32.5	56	46.7	25	20.8
Pick up the Van	22	18.3	45	37.5	53	44.2
Hilux	60`	50.0	18	15.0	42	35.0

Source: Field Survey, 2024

Respondents' Perception of the Effect of Road Transportation on the Marketing of their Major Crops

Results in Table 4 reveal that respondents perceived that the level of the transportation system can cause a reduction in farmers' income ($\bar{x}$ = 3.12). This result implies that the transportation system of the respondents does affect farmers' income. They also opined that the mode of transportation system can lead to crop damage ($\bar{x}$=2.83) and that the present condition of the roads makes the transportation of crops to the market difficult ($\bar{x}$=2.80). This result implies that the condition of the roads has an effect on the marketing of major crops in the study area. This result is in accordance with the findings of Adefalu et al. (2016), who reported that the poor road transportation network in Kaiama

Local Government Area of Kwara State led to a reduction in farmers' income. However, the quality of the transportation system does not lead to an increase in transportation fares ($\bar{x}$ = 3.03) and does not cause a shortage of vehicles ($\bar{x}$ = 2.95). Overall, these findings imply that investing in transportation infrastructure can improve the condition of the road networks so as to make it easier for farmers to transport their crops to market, which can help to increase their income and contribute to the economic development of the region.

Table 4. Distribution of Respondents' Perception on the Effect of Road Transportation on the Marketing of their Major Crops

Farmer's Perception	**SA**		**A**		**D**		**SD**		$\bar{x}$
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	
The quality of the transportation system does not cause vehicles to be unavailable	36	30.0	51	42.5	25	20.8	8	6.7	2.95
The mode of transportation system can lead to damage to crops	23	19.2	58	48.3	35	29.2	4	3.3	2.83
The level of the transportation system can cause a reduction in farmers' income	40	33.3	58	48.3	19	15.8	3	2.5	3.12
The quality of the transportation system does not lead to an increase in transportation fares	32	26.7	62	51.7	24	20.0	2	1.7	3.03
The state of the transportation system does not affect my health status	18	15.0	48	40.0	46	38.3	8	6.7	2.63
The quality of transportation system does not discourage farmers from selling their crops	15	12.5	51	42.5	36	30.0	18	15.0	2.52
In my own opinion, the condition of the transportation	14	11.7	37	30.8	50	41.7	19	15.8	2.38

system does not encourage the selling of crops									
The present condition of the roads makes transportation of crops to the market difficult	25	20.8	54	45.0	34	28.3	7	5.8	2.80
The quality of the transportation system causes a delay in transporting crops to the market.	6	5.0	19	15.8	62	51.7	33	27.5	1.98
The mode of transportation system does not lead to rotting of crops.	7	5.8	48	40.0	50	41.7	15	12.5	2.39

Source: Field Survey, 2024. Mean cut off point =2.5
*SA= Strongly Agree, A = Agree, D = Disagree, SD= Strongly Disagree

Constraints to the Transportation of Major Crops

Table 5 presents the constraints faced by respondents in the transportation of major crops. Results reveal that the high cost of fuel (3.50) was the highest constraint faced by respondents in the transportation of major crops. This result implies that the majority of the respondents will consider transportation cost in the cost of production. This finding is in line with Thomas (2021), who found that the highest constraints faced in the transportation and marketing of agricultural produce in Nigeria were high fuel costs. The high fuel cost can be attributed to fuel scarcity currently looming over the economy of Nigeria. Far distance of the market from the farm (3.40) and high labour cost (3.35) were ranked the second and third constraints faced by respondents in transportation and marketing of major crops, respectively. Similarly, high transportation cost (3.30), poor road network (3.13), and inadequate transportation facilities (3.05) were ranked as the 4th, 5th, and 6th constraints faced by respondents in the transportation of major crops for marketing in the study area.

Table 5. Distribution of Respondents: Constraints to the Transportation of Major Crops

Constraint	Severe Constraint		Moderate Constraint		Minor Constraint		Not a Constraint		$\bar{x}$	Rank
	F	%	F	%	F	%	F	%		
High fuel cost	69	57.5	45	37.5	3	2.5	3	2.5	3.50	1st
Distance from	61	50.8	47	39.2	11	9.2	1	0.8	3.40	2nd

the farm to the market										
High labour cost	59	49.2	47	39.2	11	9.2	3	2.5	3.35	3rd
High transportation cost	52	43.3	54	45.0	13	10.8	1	.8	3.30	4th
Poor road network	40	33.3	59	49.2	18	15.0	3	2.5	3.13	5th
Inadequate transportation facilities	29	24.2	73	60.8	14	11.7	4	3.3	3.05	6th
Transportation hazard	23	19.2	68	56.7	29	24.2			2.95	7th
Less impact of extension services	21	17.5	40	33.3	39	32.5	20	16.7	2.51	8th

Source: Field Survey, 2024

Hypothesis Testing

There is no significant relationship between the major crops transported and respondents' perception of the marketing of the crops.Results in Table 6 indicate that out of the major crops marketed, maize, orange, and cashew nut had a significant correlation (P≤0.05) with respondents' perceptions of the effect of road transportation on marketing. This means that the way farmers perceive the impact of road transportation has a significant effect on the marketing of these crops. The finding is in line with the study conducted by Adelugba et al. (2020), which also found a positive and significant relationship between road quality, traffic, provision and maintenance, mode of transportation, and marketing of agricultural produce in Irepodun/Ifelodun Local Government Area, Ekiti State. This result implies that improving road transportation infrastructure and services in rural areas could enhance the marketing of agricultural produce, particularly for crops like maize, orange, and cashew nut. Farmers' perceptions of the effect of road transportation on marketing should also be taken into consideration in planning and implementing transportation policies and interventions.

Table 6. Results of Chi-Square Analysis Showing the Relationship Between the Major Crops Transported and Respondents' Perception of the Marketing of the Crops

Major crop transportation perception on the effect of road transportation	**Chi square(X^2)**	**p-value**
Plantain	0.381	0.537
Banana	0.120	0.729
Yam	0.270	0.604
Maize	5.659	0.017**
Cocoa	0.852	0.356
Cassava	0.045	0.832

Orange	5.734	0.017**
Cashew nut	5.714	0.017**
Cowpea	1.873	0.171

Source: Field Survey 2024
** 0.01-0.05= 5% (Significant level)

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that most of the respondents had access to some of the types of roads available in the study area, but respondents' perception of road transportation affected the marketing of plantain, banana, maize, and cashew nut in the study area. The reasons for this were the high fuel cost, distance from farm to the market, high labour cost, high transportation cost, and poor road networks in the study area. This implies that a lot still needs to be done by relevant stakeholders, including government, policy makers, community development experts, community members, and donor agencies, to invest more in the provision and maintenance of good road transportation facilities in rural areas of Nigeria so as to facilitate the marketing of agricultural produce. Based on the findings of this study, the following recommendations were made:

- The government should invest in the construction and maintenance of good roads and the provision of transportation facilities in rural areas to ease the transportation of agricultural produce.
- Extension services in rural areas should be improved to educate farmers on modern and efficient methods of transportation and marketing of their produce.
- High use of taxi-mini bus and motorcycle as modes of transportation in the study area suggests the need for promotion of alternative modes of transportation, such as rail transportation.

FURTHER STUDY

Further study can be carried out on the:

- Perceived effect of technology on sustainable road transportation among arable crop farmers in selected Sub-Saharan African countries.
- Road transportation and food security in the Nigerian livestock industries.

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