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Road Network System and its effect on Agricultural Marketing in Irepodun Local Government Area of Kwara State, Nigeria

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Abstract

The role of road network system cannot be neglected in agricultural marketing as it helps in moving farm products from where it is been produced to where it is needed to satisfy consumers' needs. In the process of satisfying consumer needs, it also helps in boosting the economy of the nation by contributing to the national income. Without linking roads, farmers will just be laboring in vain without earning profit on their products, and consumers that are not close to where these products are produced will be experiencing scarcity of those products. It is in the light of this that this study examined the effect of road transport system on agricultural marketing in Irepodun local government area of Kwara State. The specific objectives were to: determine the effect of cost of transportation on agricultural marketing; and examine the relationship between bad road network and farmers' income. Survey design was adopted for the study, and Gilson formula for large population was used in arriving at a sample size of 369 respondents. Regression and correlation analysis were used to analyze the data gathered and hypothesis were tested at 0.05 significance level. The result of the study shows that: i. there is a significant effect of transportation cost on agricultural marketing with $R=0.927$; $R^2=0.859$; $P=0.001$; $\beta=0.431$ ii. there is a significant relationship between bad road network system and farmers' income with Correlation Coefficient= 0.701; $P=0.000$. The study therefore, concludes that road network system has a significant effect on agricultural marketing and recommends that government should try as much as possible to help in rehabilitating existing links to help the farmers enjoy more benefit of their labour and also, contribute better to the economic development of the nation.

Keywords: Agricultural Marketing, Marketing, Products Movement, Road Network System, Transportation.

Introduction

Agriculture is the biggest singular industry that keeps the economy alive by providing food and employment for majority of the populace in most developing countries of which Nigeria is not left out. The role of marketing however, now becomes very critical in achieving the objectives of agriculture because there is the need to pave way for easy identification, creation, communication and delivery of agricultural products to the consumers. Marketing helps in the distribution of goods and services from one place to the other to with a view to satisfy consumers' needs.

Agricultural marketing was the mainstay of the economy of Nigeria before the advent of mineral resources which now birth petroleum in 1956; before this period, agricultural marketing has done greatly in the area of employment more than any other sector in the country. It is the activity that involves the assembling, processing, grading, packaging, transportation, distribution, storage, advertising, and financing of agricultural product to satisfy human wants. The institutional and organizational activities carried out in the process of agricultural marketing have a multiplier effects on the economy of the nation in the sense that, processing and packaging of agricultural products would necessitate the establishment of small- and large-scale industries thereby, employing labour (Erie, 2015).

The role of road transport cannot be under emphasized in the marketing of agricultural product in Nigeria because road transportation serve as the major avenue by which products are been moved from one destination to the other, it helps in the movement of agricultural products from the farm to the fork. The best producer in the world will remain a failure if his products cannot be moved from the production center to

where it is been needed to satisfy human wants. Transportation creates market for agricultural products and also increases the interaction among geographical and economic regions as it opens up virgin areas for economic attention (Tunde & Adeniyi, 2012). Improved transportation decreases travel time therefore, increasing the time available for economic and social activities. Good road also, increases the value of farm output since transportation cost will be low and farmers will be able to enjoy the dividend of their labour. Aderamo and Magaji (2010) opines that transportation constitutes the core avenue by which diverse parts of the society are connected together. Food production is geographically disposed and the job of connecting the numerous food production centers with the consumption centers is seriously reliant on physical distribution which is majorly done through road transportation system. The different variety of Nigerian food would not be obtainable without the complex transportation network system. Therefore, it is obvious that transportation is the live wire of economic development of every nation.

Statement of the Problem

According to Barnabas (2017), agriculture which is one of the major sectors of every economy has been accorded so much importance by the Federal Government of Nigeria. Transportation being an essential facilitator for the development and expansion of commerce has called government attention recently; but despite government's effort in this sector, problems relating to rural inaccessibility have continued to hamper food availability in Nigeria. Jura (2015) stated that transportation facility serves as one of the limiting factors of agricultural marketing.

In Nigeria, road constitutes the most important means of moving goods and services from one end to the other, including agricultural product but most of the roads in Nigeria especially the rural areas are in a deplorable condition and therefore hindering the movement and marketing of agricultural product in those areas. Even where such roads are in a fair condition, there is the problem of poor maintenance, lack of adequate executive capacity, lack of suitable materials and management problem as all these results to increase in cost.

Akintola (2007) states that the condition of rural areas of Nigeria is more pathetic since they are highly deprived of infrastructural facilities, especially when compared to the urban areas. The deprived response by the responsible government agencies, to maintenances and interruptions in rehabilitation aggravates the deplorable state of the rural roads. Therefore, the poor state of rural transport in the country do not only lead to high vehicle operating cost but also result in sharp increase in prices of agricultural products and other food items.

Besides, if consumer is to respond to the growing demand then it will be necessary to evolve and reduce the cost of the flow of consumer commodities information and the entire kinds of rural services to aid its meaningful contribution to the overall economic development. The chore encompasses, increasing rural road network and mending the bad ones in existence, also, expanding the storage and processing facilities, and funding the system entirely.

Objectives of the Study

The main objective of the study was to examine the effect of road transport network system on agricultural marketing in Irepodun Local Government area of Kwara State, while the specific objectives were to:

- i. examine the effect of cost of transportation on agricultural marketing; and
- ii. determine the relationship between bad road and farmer's income.

The formulated hypotheses for the study were:

- i. there is no significant effect of cost of transportation on agricultural marketing
- ii. there is no significant relationship between bad road network system and farmer's income.

Literature Review

Conceptual Review

Afolayan (2009) noted that road transport is the most common and complex network. It has a very wide coverage, substantially suitable, extremely supple and generally the most convenient and operational available way of transferring goods and passenger from one place to the other, whether short or long distance.

Odedoku, Odokoko & Ogoji (2002) define transportation as the process by which goods are moved from their origin to where they will be consumed. "Improvement in transportation accounts largely for the improved inter-relationship and inter-dependence between the people in the country." It is now easy to transport goods from where it is surplus to where it is in short supply. It involves the movement of goods, people and services from the point of production to the selling point. Transportation is very vital to spatial organization of a society and hence, plays a significant part to political, social, and economic development of any given society. Transport is also important to the society in encouraging national harmony and social economic integration, generating sense of closeness, and communal understanding in a varied society.

Ahukannah, Ndnachi & Arukwe (1995) define transportation as a process of moving goods from the producer to the customer. It is incredible what the state of affairs would be without transportation. Farmers might not be able to market their products; stores would not be opened due to their inability to get produce for sale, and inability to obtain raw material for production and even the distribution of finished goods would lead to factories shut down. Road transport offers accessibility to social amenities, public facilities and socio-economic activities. It creates avenue to distribute new technology and techniques, increases production, brings down the cost of marketing, increases spatial interface and increases access link to education and health facilities.

Agriculture and transportation are two variables that depends largely on each other. Transportation constitutes the main component on agricultural marketing and marketing of other goods. Kotler and Armstrong (2013) observed that about 20% of an average product price is accounted for by transportation alone and constitute about 46% of the production cost. This indicates that agricultural marketing relies solely on road transportation system.

However, agricultural marketing can be defined as the performance of all business activities included in the movement of products from the beginning of agricultural production till it gets to the hands of the consumers. It does not just begin from the point of exchange of the final product but it begins from all the activities that are involved from the point of planning and production process to the stage at which it is been exchanged with the consumers.

Types of Market for agricultural products

Tracy (2017) identify the following market for agricultural product:

Farm to gate markets; This is a market whereby farmers sell their agricultural produce mostly food directly to the consumer, independent retailer etc without necessarily passing it through the middle men. Consumers goes to the production center to buy in this case e.g sales of vegetables, eggs etc.

Wholesale marketing is another type of market available for agricultural produce marketing. Here consumers don't go to the point of production to purchase because the produce passes through the middle men in the form of chain of distribution to the final consumers. While Industrial market, the third type of market available for agricultural produce marketing according to Tracey (2017) ensures the processing of the agricultural produce such as cocoa, coffee, cotton, rubber etc.

Types of transportation system available in the area of study

The predominant way by which the people of this area move themselves and their goods from one place to the other includes: taxi, wheelbarrow, legs, tricycle, motorcycle, and bicycle. This in one way or the other affect the quantity of product produced by farmer in this area.

The Roles of Transportation on the Marketing of Agricultural Produce

Agriculture and transportation are two variables that depend largely on each other. The former cannot stand alone without the latter. Transportation constitutes the main component of agricultural marketing and even other nonagricultural goods. Kotler and Armstrong (2013) observed that about 20% of an average product price is accounted for by transportation alone and constitute about 46% of the production cost thus making transport cost playing a crucial role in recognizing the link between accessibility and agricultural development.

Transportation affects the relationship between physical space and society, and changes in transportation, affect the organization of human activity in rural, urban and regional space. A properly maintained road

network is important when it comes to agricultural marketing because it is the road that links farmers to both their input markets and output markets and where good and efficient road is in short supply, it reduces farmers profit by increasing the cost of inputs and reducing their accessibility to product markets.

The role of road transport is indeed very crucial as it is a phase in production process which is not complete until the commodity is in the hands of final consumers. Availability of road transport facilities is a crucial management factor that stimulates economic growth through increased accessibility, its efficiency and effectiveness. When products are assessable at a reasonable rate, marketing of such product will not be difficult leading to increase in economic activities.

Similarly, it has effect on the major purpose of production, delivery, selling and consumption in several ways. The cost of product consumed and the power to purchase by consumers is also affected by road transportation cost. This is because the nature of roads in which goods and services passes will determine the time, quality of goods on reaching the consumers. Meanwhile, if these products reach the final consumers in record time and in good quality it will attract more money for the producers and vice versa.

Factors Influencing Transportation of Agricultural Products in Nigeria

According to Usman, Adefile & Musa (2013) states that the overall development of agriculture depends on various supportive rural infrastructural facilities. Adequate rural transportation represents one of the means of collecting and exchanging products, carrying people from one end to the other, spreading of news and encouraging rural economy (Adedeji, Olafiaji, Omole, Olanibi, & Yusuf, 2014).

The existence of accessible, acceptable and efficient transportation system is a pre-condition for linking remote farm areas located far from consumer centers with the agricultural production process (Taiwo & Kumi, 2013). The transport system is fundamental to economic and social development in rural areas, and significant investment is required to ensure it is of a suitable level.

Abdulkadir (2014) posited the following factors influencing road network:

1. Poor road surface condition: Road is a link between two end and it is very essential in the development of any economy in the world. Regrettably, majority of the rural roads are in bad shapes, unsurfaced, narrow, snaking and slippery particularly during the raining season. This has levied weighty cost on the national economy specifically to the agricultural activities as a result of increase in vehicle operational costs and times of travel (Akintola, 2007).
2. Inadequate transport services: inadequate transportation services limit the capability of the people in a nation to make use of their natural resources, distributes foods and other finished goods, integrate the manufacturing and agriculture sectors and supply education, medical and other infrastructural facilities (Mustapha, 2011). Rural area sometimes faces difficulties at waiting time. Longer waiting times due to late arrival of buses and excessive in-vehicle times due to traffic or system problems poses significant loss on their perishable goods and reduce their level of reliability. Other factors such as service frequency and service capacity also determine the usability of transport services and thus affect their reliability. If the service available is insufficient to meet the current demand, the rural dwellers are less likely to find those services reliable (Polat, 2012).
3. High way rubbery: This is another serious factor that militates against the efficient, convenient and safe transportation of people and goods. Armed robbers operate successfully by taking advantages of poor condition of roads where the driver need to drive slowly to navigates safely. The existence of many potholes road with sharp corners serves as an opportunity for them to lay ambush. When this occurs, it leads to loss of life, properties and wastage of many agricultural produce and other commodities that are being transported.
4. High cost of transport: The contribution of a rural transport network to agricultural marketing is significant. A bad network, that is, with poor roads, inappropriate and infrequent vehicles, leading to little competition among traders, can result in low prices for farmers, high prices for urban consumers and paradoxically, windfall profits for a small number of traders.

Theoretical Frame work

There are so many theories that can be used to explain the effect of road transport system on agricultural marketing; but for the purpose of this study the theory of constraints and traditional agriculture were elucidated and adopted.

Theory of Constraints

Theory of constraints was propounded by Goldratt M. Eliyahu in 1997, and according to this proponent, a constraint be anything that prevents the system from achieving its goal. Constraints can show up in many ways, the theory therefore, stipulates that constraints can be located sometimes internally (production, warehouse, purchasing, policies etc.) and sometimes externally (in the market). Internal constraints is evidence when the market demands more from the system than it can deliver while external constraints shows up when the system is producing more than the market can take which will lead the organization to focus on mechanism to create more demand for the product. This theory is significant to this study because the production and marketing of agriculture are also faced with some serious constraints of which transportation is not left out.

Theory of Traditional Agriculture

The theory of traditional agriculture was propounded by Theodor W. Schultz in 1965. Schultz was of the opinion that a man who is bound by traditional agriculture cannot produce much food no matter how rich the land may be. To produce an abundance of farm products requires that the farmers has access to and has the skill and knowledge to use the what science knows about soils, plants, animals, and machines. He further opines that farmers cannot be ordered to increase production even if they have access to knowledge but instead an approach that provides incentives and rewards to farmers are required. Schultz studied agriculture in two dimensions: traditional agriculture and transformation of traditional agriculture.

Empirical review

Tunde & Adeniyi (2012) examines the effect of road transport on agricultural development in Ilorin East Local Government Area, Kwara State. The study employed the use both primary and secondary data. One hundred and fifty questionnaires were distributed systematically to the farmers in the study area and focused group was used to obtain information on the impact of road transport on rural development as a whole. Descriptive and analytical statistics were used in analyzing the data collected. The findings revealed that the high cost of transportation of agricultural produce really affects the rural farmer's income

Barnabas (2017) examines the effect of transportation on the marketing of agriculture in Jos. The study adopted a survey design and questionnaire was the major instrument used in gathering data. The data collected were analyzed using percentage and chi-square, the result of the findings shows that transportation plays an important role in the marketing of agricultural products.

Research methodology

Survey design was used and data were gathered with questionnaire as the major instrument. The target population is large and in order to have a reliable sample size, the study employed the formula developed by Glenn (2013) to arrive at a sample size of 369 respondents. The breakdown for the calculation includes:

$$n_0 = \frac{z^2 pq}{e^2}$$

where:

n_0 = the sample size,

z^2 = the abscissa of the normal curve that cuts off an area α at the tails ($1 - \alpha$ = the desired confidence level for example 95%),

e = the desired level of precision,

p = the estimate of the proportion of attributes present in the population,

$q = 1 - p$

z is found in the statistical tables which contain the area under the normal curve.

Thus,

$$n_0 = \frac{z^2 pq}{e^2}$$

$$= \frac{(1.96)^2 (0.4)(0.6)}{(0.05)^2}$$

$$= 368.79$$

$$= 369 \text{ respondents}$$

33 respondents each were selected conveniently for each of the eleven wards except omuaran (ward 1) which has 39 respondents been the most populated ward. Research assistants were employed to administer and retrieve the questionnaire, of which 350 were filled and returned and 345 were useful for the research work. Regression and correlation analysis were used to analyze the data gathered, and hypothesis were tested at 0.05significance level.

Results and Discussion

Table 1.1 Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.927 ^a	.859	.858	2.11125

a. Predictors: (Constant), cost of transportation

From table 1.1, the correlation coefficient R is 0.927 which indicates that there exists a very strong linear relationship between the cost of transportation and the marketing of agricultural products; Also R^2 is 0.859 from table 1.1, this implies that 86% change in the marketing of agricultural product is explained by the cost of transportation while the remaining 14% is explained by other factors that are not captured in the model.

Table 1.2 ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10088.701	3	3362.900	754.456	.001 ^b
	Residual	1653.689	371	4.457		
	Total	11742.389	374			

a. Dependent Variable: Agricultural marketing

b. Predictors: (Constant), cost of transportation

Source: Researcher's Field Survey, 2019.

Table 1.2 presents the ANOVA table with a positive F-statistics and 0.001 significant value less than the alpha level of 0.05, therefore, it implies that the model is fit.

Table 1.3 Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.377	1.020		12.134	.001
	Cost of Transportation	.988	.047	.431	20.933	.001

a. Dependent Variable: Agricultural marketing

Source: Researcher's Field Survey, 2019.

The coefficient table (table 1.3) shows that there is a significant effect of cost of transportation on agricultural marketing with a significant value of 0.001 which is less than the alpha value of 0.05, therefore the null hypothesis is rejected and the alternate hypothesis accepted which implies that there is a significant effect of road transport network system on agricultural marketing. The beta value of 0.431 further shows that a 43.1% adjustment in road transportation cost will lead to 43.1% changes in agricultural marketing. Hypothesis ii: there is no significant relationship between bad road network system and farmers income

Table 1.4: Correlation Matrix

Variables	Statistical parameters	Infrastructural Decay	Farmer's income
Bad road network	Pearson Correlation	1	.701**
	Sig. (2-tailed)		.000
	N	100	100
Farmer's Income	Pearson Correlation	.701**	1
	Sig. (2-tailed)	.000	
	N	100	100

Source: Researcher's Field Survey, 2019.

Table 1.4 shows the correlation table and it reveals that there is a very strong and positive correlation between bad road network system and farmers income with a Pearson Correlation of 0.701 (70%) and significant value of 0.000 which is less than the alpha value of 0.05. Therefore, the null hypothesis is rejected and the alternate hypothesis accepted which connotes that there is a significant relationship between bad road network system and farmers' income.

Discussion of Findings

This study examined road network system and its effect on agricultural marketing in irepodun local government area of kwara state. The study reveals that the cost of transportation has a great effect on agricultural marketing. This implies that increase or decrease in transportation cost will lead to changes in agricultural marketing. This study is in tandem with that of Tunde & Adeniyi (2012) and Barnabas (2017). The result of the study also shows that there is a significant relationship between bad road and farmers' income. This indicates that bad road in one way or the other contributes to reduction in farmers' income, thereby discouraging farmers from producing on a large scale and this poses a lot of problem to economic development.

Conclusion and Recommendations

Conclusion

The main objective of the study was to examine the effect of road network system on agricultural marketing, while the specific objectives were to examine the effect of transportation cost on agricultural marketing and to determine the relationship between bad road network system on farmers income.

The first hypothesis reveals that $R = 0.927$, $R^2 = 0.859$, b-value = 0.431 with P- value of 0.001 which is less than the alpha value of 0.05. this implies that transportation cost in that area is very affects agricultural marketing seriously because and people and goods must move from one destination to the other, and the cost of transporting this good as a result of bad road effect discourages a lot of people from agricultural marketing because nobody will be ready to go into any unprofitable business.

Hypothesis ii also reveals a correlation value of 0.701 with a significant value of 0.000 which is less than the alpha value of 0.05 which implies that that there is a strong positive correlation between bad road network system and farmers income. It means that bad road has a great effect on farmers income because before farmers will be able to transport there products from where is was produced to where they will be able to get it sold, transportation cost as a result of bad road must have taking the larger part of what their income is supposed to be and therefore discouraging them from going into large scale production.

Recommendations

Government should try as much as possible to come to the aid of those people in that local government area by helping in constructing adjoining roads that are not existing and also rehabilitating existing one and also through a body try to regulate transportation cost in other to make agricultural marketing encouraging or interesting to both the farmers and the marketers of the products.

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