

An Assessment of Agricultural Freight Transportation in Saki Area of Oyo State, Nigeria

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Abstract - Transportation no doubt remains a catalyst for all aspect of socio-economic and environmental development. Without its singular significance of mobility and accessibility for farmers, agricultural produce will rot on farms, while efforts in providing food would be fruitless. This paper assessed agricultural freight transportation in Saki area of Oyo State with a view of enhancing better product delivery mechanisms for farmers. It examined farmers' socio-demographic; nature of farming and farm characteristics; and appraised the relationship between attributes of agricultural production and freight movement. Primary data employed consists of a questionnaire designed for farmers, structured interview for government officials complemented with personal field observations of agricultural freight transportation. 225 farmers were randomly selected for questionnaire administration. Major findings revealed that food crops, vegetables, fruits and poultry products are in persistent motion in the study area and that agricultural freight is a neglected sector with significant consequences on the access to cheap and affordable urban wellbeing. Findings also revealed that agricultural freight transportation within the study is very poor and uneconomical, as this depletes farmers' profit-making. Regression analysis results show a significant relationship between attributes of agricultural freight and transport cost ($F^{19}_{205} 11.916 = P < 0.05$). The study recommends extensive road rehabilitation and constructions within the study area; provision of technological driven distribution and storage infrastructural facilities; creation of a databank for agricultural freight transport; reorganization and empowerment of farmers and improvement of rural infrastructure in Oyo state and Nigeria as a whole.

Index Terms - Farmers, Agricultural Freight, Transportation, Saki Area

I. INTRODUCTION

Agriculture, no doubt remains a backbone of many nations socio-economic, political and environmental development since time immemorial. Even, the early development of Nigeria economy and her colonization by British were partial as a result of her favourable agricultural potentials and supporting climatic conditions. It is on this basis that [4, 12, 19, 20] opined that agriculture sustained Nigerian economy at independence with the promise of a vibrant agrarian economy by contributing 67 per cent of the Gross Domestic Product (GDP) in 1960/61. However, [23, 24] opines that the contribution of agricultural sector to total GDP of Nigeria has fallen over the decades, from a very dominant position of 55.8 per cent of the GDP in 1960-1970 to 28.4 per cent in 1971-1980, before rising to 32.3, 34.2 and 40.3 per cent during the decades 1981-1990, 1991-2000 and 2001-2009 respectively.

Transportation in one form or the other is a basic and essential requirement of daily human activities as no human activities (including agriculture) can take place without its services [2, 21]. While freight transportation plays a crucial role in the smooth running of any economy in which road sector dominates, agricultural practices usually produce freight which in turns translates into wealth for the national economy including developed and developing ones [18, 21]. Agricultural freight comprises of agricultural produce from the farmlands to non-urbanised areas, markets, city centres and for exports to other countries [5, 6].

Such freight consists of food crops, cash crops, livestock, poultry products and perishables such as vegetables, tomatoes, pepper and fruits etc., that are produced majorly in rural settlements at

different scales [6, 18, 20], and for towns and cities which constitute the best-price market for such. In this regard, urban inhabitants across the world depend on farmers in agricultural areas for their daily requirements of agricultural goods for consumption, industrial processes and other production activities [20, 25]. Hence, the need for an efficient flow of agricultural produce from agricultural communities to urban centres as a fundamental aspect of the daily functioning of the urban-rural system towards the sustenance of human population must not be compromised.

The reality of transport especially in agricultural producing areas such as Saki is that a considerable amount of valuable time, efforts and incommensurate amount of money are required to access this socio-economic service. Majority of communities in Saki area are not only rural but depend on rural road transport for personal mobility and marketing of their resource-based production. However, the profitability of farming operations is affected particularly when prices of the produce adjust to changes in transportation rates. Regrettably, limited or no attention is being accorded to agricultural freight and more importantly efficient flow and movement of traffic (freight). Therefore, attempts to bridge such gap and the need to facilitate timely, cheap and easy delivery of agricultural freight to boost the productive capacity of farmers within Oyo State and Nigeria at large necessitated scholars cum professionals' intervention particularly through research recommendations.

More so, despite knowing Saki area as the food-basket of Oyo State, road transportation system particularly freight transportation is usually fraught with serious challenges which usually reflected and resulted to high transport cost of agricultural freight to prospective diverse destinations; increasing crime rate; theft; road crashes and freight damages. Furthermore, with the global food crisis occasioned by climate change, the need to enhance fast technological driven evacuation measures through smart distribution and supply methods of agricultural produce and general freight to consuming places is of utmost necessary particularly in developing nations including Nigeria. It is based on these foregoing that this paper analyses agricultural freight transportation from the perspectives of farmers, and equally bridge the academic gap with better measures and recommendations to facilitates timely and smart freight delivery mechanisms and production capacity of farmers within the study area and areas with similar characteristics and challenges in Nigeria and its environs. In achieving this aim, specific objectives pursued were to examine the socio-economic characteristics of farmers in the study area, assess the nature of farming and farm characteristics in the study area, appraise the characterization of agricultural production and freight transportation as well as establish the statistical relationship between the attributes of agricultural freight and transport cost. In other words, for logical and factual understanding, this study was structured into five sections. Following the introductory section was the brief literature review. The third section dealt with the study methodology. It gave an insight into the study area and sampling collection methods. The fourth section presents the analyzed data and discussion of findings, while the fifth and the last concludes with the way forward.

II. BRIEF LITERATURE REVIEW

Transport is not an end in itself, it represents an engine and catalyst for not only socio-economics development but the survival and sustainability of both national and international economies [22]. The effective and safe exchange of resources (human and non-human), materials, information and services constitute the principal function of any transport system including freight transport [8, 22]. By definition, agricultural freight transportation involves the movement or conveyance of agricultural products from the farmlands to the domestic markets and outwards as export to another country or across the border. Meanwhile, [11] observed that agricultural product freight movement is one of the largest consumers of freight transportation services in the United States of America and the growth in agriculture cultivation during the last decades is primarily indebted to the transportation system.

The main objective of agricultural freight transportation is to meet the ever-increasing demand and supply of agricultural produce with minimum expenditure of resources without compromising both time and place utilities. Thus, through efficient delivery of raw materials and finished goods timely, cheaply and safely, formidable and sound economic performance is guaranteed. Moreover, studies like [16, 8, 13, 26, 3, 14, 15] have studied and revealed the importance of freight transportation to the human and natural environment as well as national growth and economic development.

Unfortunately, despite this noticeable importance as revealed in literature, the agricultural freight transportation, particularly in the third world countries including Nigeria, is still faced with different issues including limited and poor infrastructural facilities, competing for demand with passenger transportation, poor or weak policy actions, poor management and operational neglect [22]. Moreover, since the independence of Nigeria, the major focus of infrastructural facilities investment and policy matters relating to transportation sector has been geared towards passenger movement at the expenses of the freight transportation leading to various economic catastrophes. Meanwhile, infrastructural facilities are undoubted determinants of the competitive success of the sectors of the economy including the agricultural sector.

In this regard, [10] opines that well-functioning transportation infrastructure is crucial to keep transportation costs at a low level and preserve international competitiveness, while a lacking infrastructure may generate high costs for transportation and logistics as well as lead to congestion and consequently longer delivery time in peak harvest seasons. Supporting this assertion, [9] observes that transportation infrastructure can determine the competitive success of agricultural enterprises or the entire agricultural sector. With the increasing food crises, extreme weather and failure of infrastructure rated as top world global risks [26], the need to minimize these contemporary global risks, minimize the loss in socio-economic values and ensure efficient delivery of agricultural produce underscore workable framework for transporting the agricultural freight.

“Ref [3]” opined that the importance of good rural-urban roads and suitable means of transporting agricultural produce that encourages high productivity and profitable prices with the minimized cost of transportation is extremely essential. Accordingly, [13] found that different transport networks used for movement and logistics distribution particularly freighting of agricultural produce or commodities are affected by problems like; instability of gasoline price, delay and harassment by law enforcement as factors causing inefficiency in the distribution of agricultural commodities aside from others that cause damage, perishing and loss of weight include poor transport infrastructures, numerous driver stopover places and mechanical problems that are mostly because of old age of vehicles. “Ref [14]” also established that the quality of transport services for enterprises and organizations of agricultural and industrial complexes and harvesting-transportation-realization (HTS) complex does not meet contemporary requirements. Accordingly, the increase in transportation cost is directly passed on to the weaker market player that is the failure to meet the contemporary requirements. Thus, rising transportation costs affect market prices. In other words, a study conducted by [27] revealed that time restriction can increase freight costs and slightly decrease local emissions, while logistics sprawl can increase both costs and emissions.

III. MATERIALS AND METHODS

A. Study Area (Saki Area of Oyo State, Nigeria)

Saki area with headquarters in Saki town is one of the ancient Yoruba towns in Nigeria. It is known to be the first settlement founded by Ogun [1] and has a close affinity with Oyo. The area is a prominent agricultural settlement right from the period it was founded in which farming was the second factor that popularized it in the 19th century. Saki area was known as Ifedapo Local Government Area with headquarters in Saki till 1996 when it was restructured into Saki East, Saki West and Atisbo Local Government Areas.

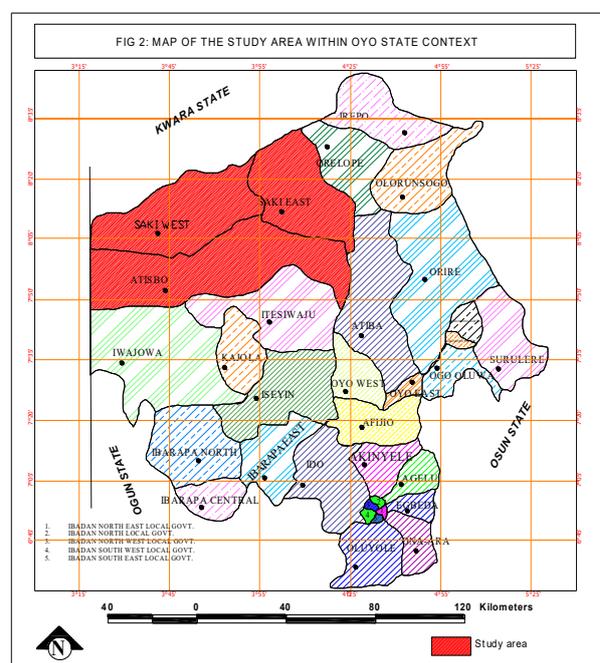
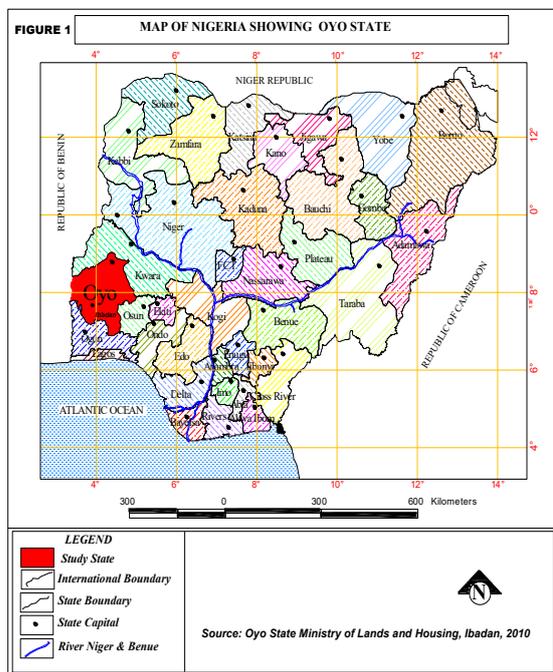
The study area has an estimated land area of 6410km² and is located in Oyo North Senatorial District of Oyo State and is geographically located between latitude 8°20' and 9°0' North of the Equator and between longitudes 2°40' and 3°50' East and West of the Greenwich meridian respectively [6]. The area is endowed with favourable climate and vegetation which permit the luxuriant growth of grasses and cereal crops. However, road transport is the dominant mode of transport used and the network is characterized by both private and public-private vehicular movements with the absence of conventional public transport system within the study area.

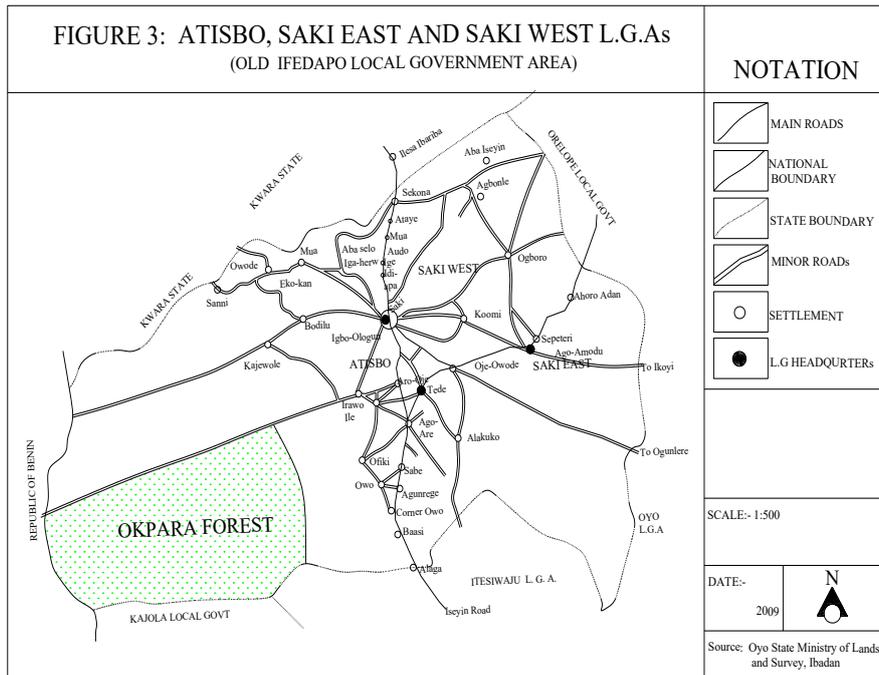
B. Sampling Collection

In achieving the goal of this study, combinations of methods are used in sourcing for the required data from farmers in the study area. First, primary data consisted of the use of a questionnaire as a major instrument. This enabled the administration of questionnaires to farmers as a major stakeholder in evacuation and transportation of agricultural freight. This was complemented by oral interview and personal observations of related events in the agricultural freight transportation in the study area.

This study centred on the identified farmers' groups in the study area namely Association of Farmers in Nigeria (AFAN), Farmers Development Union (FADU) and Ifedapo Farmers Association (IFA) with a total of 9,015 members from which 2.5% (225) respondents were randomly selected within Saki area. However, Saki area of Oyo state which is the study area is known as the centre of agricultural activities in the region considering the degree of agricultural practice, quantity of agricultural produce, trading and transportation in the area.

Secondary Source of data employed the use of published and unpublished related materials. This data source provided a better understanding of nature, evolution and pattern of agricultural freight in the country at large. However, both descriptive and inferential techniques were used to present and analyze data collected. Descriptively, percentage frequency tables and charts were used to present the obtained data, while the hypothetical statement (H_0 : there is no significant relationship between attributes of agricultural produce and transport cost) was inferentially tested using the multiple regression technique. Invariably, both the descriptive statistics (used for data presentation) and the inferential statistics of regression analysis (used for empirical understanding that is to test postulated hypothesis) were run through the use of Statistical Package for Social Sciences SPSS IBM version 21.





IV. RESULTS AND DISCUSSION

A. Socio-Economic Characteristics of Respondents (Farmers)

The result of the administered questionnaire was summarily presented in this section with supporting Tables and charts. The survey findings revealed in Table 1, shows that, slightly less than three-quarter of farmers (72.9%) were males, while the remaining which is almost one-quarter were females. This is not unusual since male have been dominating agricultural practice and production since time immemorial. Also, the majority of farmers have matured age-wise as none of the respondents was below the age of 18. It was observed that more than one-third of farmers (34.2%) were 50-59 years and slightly over one-tenth (12.0%) were within 18-29years. It can be deduced that none of the respondents could be regarded as a teenager as a significant proportion (of more than three-quarter) are those above 29 years old.

On the educational attainment of the respondents, the study shows that slightly above a quarter of farmers (26.7%) possessed primary school certificate, less than a quarter (24.9%) with secondary school certificate (24.9%) and 15.6% has no formal education. Those with NCE/ND and BSc./HND certificates accounted for 14.7% and 11.6% respectively, while 6.7% possessed higher degrees. This shows that more than three-quarters of farmers are literate, considering the various classes of academic qualifications they possessed. The marital status of respondents showed that majority (70.2%) of them were married, while those who are divorced and separated accounted for 15.1% and 5.7% respectively.

Table 1: Socio-Economic Characteristics of Respondents (Farmers)

Variables		Frequency	%
Sex:	Male	164	72.9
	Female	61	27.1
Age:	18-29	27	12.0
	30-39	38	16.9
	40-49	50	22.2
	50-59	77	34.2
	60 and above	33	14.7
Education:	None	35	15.6
	Primary school	60	26.7
	Secondary school	56	24.9
	NCE/ND	33	14.7
Marital status:	HND/Bsc	26	11.6
	Higher degree	15	6.7
	Single	21	9.3
Income:	Married	158	70.2
	Divorced	34	15.1
	Separated	12	5.3
	N7,500-N10,000	31	13.8
Above N40,000	N10,001-N20,000	27	12.0
	N20,001-N30,000	52	23.1
	N30,001-N40,000	69	30.7
	Above N40,000	46	20.4

Source: Fieldwork, 2018.

The average monthly income of sampled farmers ranged from N7,500 to above N41,000. Also, more than one-quarter (30.7%) realized N30,001-N40,000, while slightly lower than a quarter (23.1%) earned N20,001-N30,000 on a stream of production. Less than a quarter (20.4%) earned above N41,000, and the remaining 13.8% and 12.0% accounted for those earning N7,500-N10,000 and N10,001-N20,000 respectively on monthly (Note that Tables and charts are from Authors, 2011 unless stated otherwise).

B. Nature of Farming and Farm Characteristics in the Study Area

Table 2 shows the responses related to the nature of farming and farm characteristics of the sampled farmers in the study area. Concerning the number and types of farms owned, it was observed that majority of farmers cultivated more than one farmland. Precisely, 36.4% and 36.0% of farmers have two and three numbers of farms respectively, 14.7% cultivate more than three farms, and the remaining 12.9% have only one farm. Also, more than one third (38.2%) of farmers cultivated forest/distant farms, more than half (52.0%) have both neighbourhood and forest farms, while less than one-tenth (9.8%) cultivated only neighbourhood farm.

Table 2: Nature of Farm and Farm Characteristics of Respondents

Number of farms			Types of farms		
Number	Frequency	%	Types	Frequency	%
One	29	12.9	Neighbourhood	22	9.8
Two	82	36.4	Forest/distant	86	38.2
Three	81	36.0	Both	117	52.0
More than three	33	14.7	Other specify	-	-
Farming experience			Farm distance		
Experience: <5yrs	26	11.6	1-5km	23	10.2
6-10 years	37	16.4	6-10km	38	16.9
11-15 years	53	23.6	11-15km	51	22.7
16-20 years	86	38.2	16-20km	62	27.6
Above 21 years	23	10.2	Above 21km	51	22.7

Source: Fieldwork, 2018.

Similarly, on the findings of farming experience and farm distance presented in Table 2, it is observed that more than a quarter (38.2%) has been farming for 16-29 years, close to a quarter (23.6%)

has 11-15 years of experience, less than one-fifth (16.4%) has 6-10 years of experience and about one-tenth (11.6%) are those with less than 5 years farming experience. Farmers whose experience transcends 21 years account for 10.2% of the sampled population. With this, farmers sampled are professionals, and their views could be seen as reliable and dependable considering the number of years they have been practising farming. However, it is equally observed that more than one quarter (27.6%) of farmers have their farm within the distance of 16-20km, less than a quarter (22.7%) travelled 11-15km to their farms, and those whose farms distance exceeds 21km account for 22.7%, while one-tenth (10.2%) and less than one-fifth (16.9%) travelled 1-5km and 6-10km respectively to their farms daily. With this, the majority of farmers have their farms above 5km from their homes.

C. Characterization of Agricultural Production and Freight Transportation

Table 3 shows the response of farmers to varieties of issues regarding farm produce and harvest periods. It was observed that the dominant farm produce in Saki area were food crops, tubers, vegetables/fruits and poultry products. However, nearly a quarter of farmers (21.3%) combined food crops and tuber produce, while less than a quarter (18.7%) produced tuber only. 14.2% and 17.3% accounted for those whose farm produce were food crops and vegetable/fruits respectively. Farmers who combined vegetables/fruits and food crops were 12.0%, while poultry produce accounted for 16.4% of the responses received. It is deduced from this that, combinations of food crops, tubers, poultry, fruits and vegetables dominated the study area of which the cultivation is continued throughout the years.

Similarly, the harvest periods for the crops/produce ranged from 1-3 months to more than 12 months as the case may be. It is observed that nearly half of farmers amounting to 42.2% have their harvest periods to be 10-12 months, while less than a quarter (23.6%) harvests their produce in 7-9 months. Those whose harvest periods are 4-6 months and 1-3months account for 16.0% and 9.8% respectively, while the remaining 8.4% account for those whose harvest period transcend 12 months. It can be deduced that produce harvest in the study area is almost throughout the year as there is always one product or the other to harvest within three months interval.

On the types and nature of road used by farmers, it is shown that nearly two-thirds of roads leading to the farms were single lane-roads which accounted for 74.7%, while the remaining (27.3%) were footpaths. Also, 76% of the roads are earth surfaced roads, while the remaining (24 %) are bituminous. It can be extracted from the data that most of the farms were accessible by roads irrespective of their quality and standards. However, the condition of roads as assessed by the farmers (and also observed by the authors) showed that more than half were in deplorable conditions while slightly less than a quarter were fair. Those who stated that the condition of the road in their area was good and very good were very few as represented by their meagre size in the sector. Hence, deplorable conditions of roads have very serious negative effects on the flow of agricultural freight in the area.

Concerning the movement of produce after harvest, it is observed that close to half of farmers (43.1%) moved their produce to markets outside their community; while more than a quarter (32.4%) moved their produce to markets within their community after harvest. Those who moved their harvested produce home were 12.9%, while 11.6% sold their produce on the farm. Also, on the packaging of farm produce, half of the farmers sampled (50.7%) do not package their harvested produce, while slightly higher than a quarter (28.9%) used the sack as packaging material. Those who use basket accounted for 11.6%, while the remaining 8.9% used specialized unit such as crate/pallet. This showed that the type of packaging used depends on the type and nature of farm produce to be transported. However, bags were used to package food crops such as yam flour, beans, cowpea and maize among others while tubers such as yam required no packaging. Likewise, poultry products such as eggs and chicken used a crate and specialized container (box) as packaging material for safety reasons and to maintain the market values.

Of the five means used by farmers in transporting farm produce to markets in the study area, the use of taxi/car ranked highest as it accounted for 41.8% of the means used. This is followed by motorcycle (17.8%), truck/lorry (16.9%), human portorage (9.3%) and the use of bus (14.2%). This shows

that human portorage is steadily fading away as the dominant means of transporting produce, especially over a long distance, while the use of taxi/car is gaining prominence. Also, the use of taxi/car is more rampant for transporting produce to markets within the community/area, while truck/lorry dominated those uses for markets outside the community because of their large carrying-capacity and long distance involved. Similarly, it was observed that 36.0% of farmers each attributed the reason for mode selection to the availability of specific vehicles, and volume of freight to be moved. Also, 14.7% and 13.3% attributed their reasons to be cheapness and affordability respectively which were the main factors of patronizing a particular mode for transporting the produce. However, both the volume of production and the availability of typical transport means are the dominant factors that influenced farmers in their modal selection for freight movement in the area.

It is observed in Table 4 that farmers relied on both retailers and wholesalers for the marketing of their produce. By this, only a quarter of farmers (25.4%) market their produce directly, while those who market their products through retailers and wholesalers accounted for 37.3% each of the sampled farmers. Also, a significant proportion of farmers (52.4%) patronizes markets periodically in the study area, 19.1% each represented those who visited markets weekly and occasionally, while the remaining minority 9.3% patronize market on daily basis. With this, it deduced that most farmers patronized markets periodically in the area since marketing day is fixed /scheduled for buyers and sellers to converge for transactions.

On the trip distance and duration, it is observed that more than one-quarter of farmers (38.2%) made a trip that exceeded 200km, while those with less than 50km account for 19.6%. Also, 16.9% of farmers cover 151-200km, while those who cover 101-150km amounted to 10.7% and the remaining 14.7% are those whose trip distance is 51-100km. The trip duration of farmers in the study area ranges between less than 60 minutes and above 4 hours. A slightly higher than a quarter (29.3%) has a trip duration of 181-240 minutes, while 20.4% and 20.0% of them have trip durations of 121-180 minutes and 61-120 minutes respectively. The remaining 18.2% account for those with a trip duration that exceed 4 hours. It is deduced from the data that trip distance and time spent in travelling to markets is higher considering the geographical location of the study area to other possible urban markets.

Table 3: Characterization of Agricultural Production and Freight Movement

Agricultural Produce			Harvesting periods		
Varieties	Frequency	%	Periods	Frequen cy	%
Food crops	32	14.2	1-3months	22	9.8
Tubers	42	18.7	4-6months	36	16.0
Fruits	39	17.3	7-9months	53	23.6
Poultry	37	16.4	10-12months	95	42.2
Food crops/tubers	48	21.3	Above 12 months	19	9.4
Vegetables /crops	27	12.0	Other specify	-	-
Types of road			Nature of road surfacing		
Footpath	57	25.3	Bituminous surfacing	54	24.0
Single lane	168	74.7	Earth-road	171	76.0
Pattern of freight movement			Freight packaging		
Movement : To home	29	12.9	Packaging: None	114	50.7
Within markets	73	32.4	Sack	65	28.9
Outside markets	97	43.1	Baskets	26	11.6
Sold at point of harvest	97	11.6	Crate/box	20	8.9
Means of freight movement			Factors for transport selection		
Human portorage	21	9.3	Availability	81	36.0
Motorcycle	40	17.8	Cheapness	33	14.7
Bus	32	14.2	Affordability	30	13.3
Taxi/car	94	41.8	Produce volume	81	36.0
Truck/Lorry	38	16.9	Other specify	-	-
Methods of produce marketing			Rate of market patronage by farmers		
Self-marketing	57	25.4	Daily	21	9.3
Retailers	84	37.3	Weekly	43	19.1
Wholesalers	84	37.3	Periodically	118	52.4
Other specify	-	-	Occasionally	43	19.1
Trip Durations of farmers			Average distance Traveled		
Less than 50km	44	19.6	Less than 60mins	27	12.0

51-100km	33	14.7	61-120mins	45	20.0
101-150km	24	10.7	121-180mins	46	20.4
151-200km	38	16.9	181-240mins	66	29.3
Above 200km	86	38.2	Above 4hours	41	18.2
Income realized			Implications of exorbitant transport cost		
Less than N5,000	17	7.6	Increased selling price	29	12.9
N5,001-N10,000	28	12.4	cost of production	80	35.6
N10,001-N15,000	33	14.7	Reduction in profit	116	51.5
N15,001-N20,000	59	26.2	Other specify	-	-
N20,001-N25,000	30	13.3	-	-	-
Above N25,001	58	25.8	-	-	-
Problems encountered			Farmers' suggestions for improvement		
High transport fare	66	29.3	Road rehabilitation	90	40.0
Road extortion	49	21.8	Grant provision	34	17.3
Deplorable roads	89	39.6	Extortion minimization	44	19.6
Road insecurity	21	9.3	Road security	26	11.6
Road accident	-	-	Rail service	26	11.6
Other specify	-	-	Other specify	-	-

Source: Fieldwork, 2018.

Also, three implications of exorbitant transport costs on agricultural produce in the study area were identified and presented in Table 3. Findings revealed that over half of the respondents (51.5%) expressed obvious reduction in the profit accrued to them at the end of the farming year, more than quarter (35.6%) identify incessant increment in the cost of farm production due to outrageous transport cost, while it increased the selling price of the agricultural produce (12.9%) in the markets, hence reducing selling rate and increasing rate of leftovers. From the foregoing, one major inference drawn is that there is a steady reduction in the quantity of agricultural produce being sold daily due to high market prices attached to such, and subsequent reduction in anticipated profits.

The problems encountered by farmers in the course of transporting agricultural freight in the study area show that deplorable road condition (39.6%), high transport fare (29.3%) and road extortions (21.8%). Also, 9.3% of farmers identify a high rate of route insecurity for freight transportation in the area. Considering the responses above, it is clear that challenges facing agricultural freight transportation in the study area are multi-faceted to the extent that the challenges equally slowing down the distribution and supplying process of agricultural freight in the area. In contrast, farmers made useful suggestions towards improving the existing situation as more than a quarter of farmers (40.0%) identify extensive road habilitation, less than one fifth (17.3%) recommend the provision of suitable vehicles by government and 19.6% identify minimization of road extortion. Lastly, 11.6% each identify improved road security and extensive rail network/service to the area.

D. Results of Hypothesis Testing

Further investigations were carried out to establish the degree of affinity between the dependent (transportation cost) and independent variables (attributes of agricultural freight) and were examined through the use of multiple regression analysis. This analytical technique makes use of dummy variable of the regression model to calibrate some of the qualitative predictor variables to quantitative variables in a dichotomous form, while other predictors and dependent variable (transportation cost) were measured on a continuous scale. However, Table 4 combined the major output of multiple regression results that includes the model summary, the analysis of variance table of the test of significance of the model, and more importantly the unstandardized coefficient as well as the T-values and their significance values. The multiple regression coefficients, particularly the R² is 0.481, reflecting that 48% of the variation in transportation cost is explained by the independent variables combine (predictors). This level of explanation has an analysis of variance of the model of F ratio value of 11.916, which is statistically significant at 0.000 (Table 4). However, the independent variables (predictors) combined to explain significantly the transportation cost incurred by respondents for the movement of their agricultural freight.

In other words, in terms of the relative importance of the individual predictors in the model used, thirteen (13) out of the nineteen (19) predicting variables are statistically significant, namely: difficulty encountered (p=0.000), farm harvest period (p=0.002), farmland size (hectare) (p=0.000), nature of

road ($p=0.16$), volume of farm produce ($p=0.000$), average farm distance ($p=0.011$), transport means to farm ($p=0.038$), farm type(s) ($p=0.002$), trip distance ($p=0.000$), produce transport to market ($p=0.037$), rate of market patronage ($p=0.029$), road condition ($p=0.000$), trip duration ($p=0.002$). Perhaps these variable are the most important of the statistically significant predictors. With decision rule that H_0 should be accepted if calculated p. value is more than 0.05 significance level, it is observed from Table 4, that the calculated p.value (0.000) is less than 0.05 significant level (Table 4). Hence, the H_1 is accepted while the H_0 is rejected. However, it is observed that the attributes of agricultural freight are statistically influenced by transportation cost. Hence, the cost of agricultural freight production is a function of transport cost.

Table 4: Regression Result (H_0 : There is no Significant Relationship between Attributes of Agricultural Produce and Transport Cost)

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.724 ^a	.525	.481	1.13684		
ANOVA^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	292.614	19	15.401	11.916	.000 ^b
	Residual	264.941	205	1.292		
	Total	557.556	224			
a. Dependent Variable: TRANSPORT COST						
b. Predictors: (Constant), Difficulty Encountered, Farm Harvest Period, Number of Farms, Farmland Size (Hectare), Nature of Road, Farm Produce, Average Farm Distance, Transport Means to Farm, Packaging Required, Type of Road to Farm, Farm Type(S), Produce Movement After Harvest, Farm Produce Marketing, Trip Distance, Produce Transport to Market, Rate of Market Patronage, Road Condition, Income Realizable, Trip Duration						
Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.002	.896		-1.119	.265
	Number Of Farms	-.082	.112	-.046	-.731	.466
	Farm Type(S)	.508	.158	.214	3.213	.002
	Average Farm Distance	.263	.103	.213	2.560	.011
	Transport Means To Farm	.145	.083	.101	1.744	.038
	Farmland Size (Hectare)	.542	.091	.382	5.937	.000
	Volume Farm Produce	-.059	.056	-.061	-1.047	.002
	Farm Harvest Period	-.293	.106	-.208	-2.753	.006
	Nature Of Road	.329	.234	.089	1.408	.016
	Type Of Road To Farm	.194	.212	.054	.916	.361
	Road Condition	.498	.119	.324	4.186	.000
	Produce Movement After Harvest	.030	.115	.016	.256	.798
	Packaging Required Farm Produce	.044	.092	.027	.477	.634
	Marketing	.010	.154	.005	.064	.949
	Produce Transport To Market	-.132	.063	-.152	-2.097	.037
	Rate Of Market Patronage	.240	.145	.129	1.658	.029
	Trip Distance	-.296	.068	-.296	-4.326	.000
	Trip Duration	-.341	.110	-.279	-3.110	.002
	Income Realizable	-.049	.082	-.049	-.598	.551
	Difficulty Encountered	.459	.114	.289	4.042	.000
a. Dependent Variable: TRANSPORT COST						

Source: Fieldwork, 2018.

E. State of Agricultural Freight Transportation in Oyo State

On the outcome of the in-depth Interview with relevant government Ministries, Department and Agencies (MDAs) such as the Oyo State Ministry of Agriculture and Natural Resources, Ministry of Works and Transport, Oyo State Agricultural Development Programme (OYSADEP), Department of Works and Agriculture, the findings showed that there was no designated government intervention on agricultural freight in the study area. Rather, what could be seen as interventions relating to the scope of this study were agricultural development initiatives carried out by OYSADEP. The programme was specifically established to stimulate efficient agricultural production by transfer of adaptable technologies in all areas of agricultural practice towards increasing farmers' productivity, income generation and standard of living [7, 17]. OYSADEP was also strengthened in finance, research, personnel and empowered to rehabilitate rural-farm roads equipment as well as very active and resourceful during the period to farmers and the communities. However, the relocation of operational headquarters of OYSADEP to Ibadan and her gross underfunding incapacitated the Agency in proceeding with its mandate especially, as related to rural farm roads. Further, rural roads and rural transport infrastructure in the study area were attended to through the defunct Directorate of Foods, Roads and Rural Infrastructure (DFRRI) as Saki-Ogboro-Igboho and Igboho-Igbeti roads were re-surfaced and upgraded during DFRRI era [6, 7, 17].

V. CONCLUSION AND RECOMMENDATIONS

This paper had assessed agricultural freight transportation in Saki Area of Oyo State towards improving the economy of the study area through the strengthening of mechanism for evacuation, movement and transportation agricultural produce and freights which will greatly minimize hunger and malnutrition attributed to the inefficient supply of farm produce especially to urban populace. The study reiterated the importance of good roads and suitable means of transporting agricultural freight and farm produce to encourage productivity and enhancing profitable prices while minimizing the cost of transportation that reduces farmers' yield and profits. It was established that food crops, vegetables, fruits and poultry products abound in commercial quantity in Saki area as farming and produce trading occur throughout the year. Agricultural freight transportation is often a neglected issue that usually has significant consequences on the access to cheap and affordable farm products by urban residents and by extension health and well-being.

With Saki area being the remotest part of Oyo state from Ibadan, the state capital, farmers face immense constraints before their agricultural produce could be evacuated, and transported to various urban markets spread across the country and beyond due to deplorable conditions of roads and associated challenges with such exercise. This usually brings about an economic loss in the farmers' output especially when involved with the perishables and by extension, reduce the socio-economic potentials of farmers involved. While the issues of agricultural freight transportation transcend road improvement, the study concludes that there is total neglect of agricultural freight transport in the study area in particular, and the country at large. This is attested to by the Oyo State Government's 10km policy of road rehabilitation that was only restricted to urban centres in which rural roads are excluded from such scheme.

With this, local roads in the Oke-Ogun area of Oyo State, in particular, are in extremely deplorable conditions as the earth-roads are rarely maintained. Therefore, the assessments of agricultural freight transportation in the study area revealed characteristics that reflect depletion in energy, declining profit and high running costs for farmers. It is on the base of the above that, the following recommendations are made. First is the provision for agricultural produce databank and storage facility to have a sustainable plan and efficient mechanism for agricultural freight transportation in the study area and the country. By this, the government should make provision for a storage facility in Saki where accurate measurement and records of products shall be taken for planning purposes. This, in turn, will undoubtedly make Saki as one of the major hubs for agricultural freights that will enable an adequate record of data and farm produce to be kept for future use and analysis home and abroad. The re-introduction of a storage system with an emphasis on small-scale and large scale depot is capable of promoting sustainable agricultural freight transportation.

Second, extensive road rehabilitation and construction in the study area is another issue that has to be addressed. The importance of a good road system in terms of design, construction and regular maintenance to the general development of any economy is enormous. In view of this, concerted efforts by government at all levels to strategize towards improving the quality and performance of roads in agricultural producing areas like Saki is essential. Adequate initiation and funding of rural roads as well as their routine maintenance by specialized agencies such as Federal Roads Maintenance Agency and Oyo State Road Maintenance Agency are veritable to improving the quality of rural lives and rural economy.

The traditional role of OYSADEP in the overall development of agricultural production and improving rural infrastructure in Oyo state should be restored by Oyo State government. Thus, the agency should be re-organised and empowered with her operational headquarters returned to Saki. This shall greatly facilitate her complementary role of improving and maintaining rural access roads for easy evacuation and transportation of agricultural produce from farms to the storage facility and by extension, markets.

The preparation and implementation of Saki Regional Development Plan and transport plan are long overdue. These plans shall harness the resources and potentials that abound in the agricultural sector in Saki area in particular and Oke-Ogun area as a whole for the overall development of Oyo state and the country at large. It is of note that the plan shall integrate land uses, population, critical infrastructure and human capital resources in the area towards strengthening the economy of the region among others. The resources of the area could be better utilized as Regional Development Plan shall ensure that settlements and villages were not only planned according to the natural endowment but also integrated into the national economy.

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