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ROAD TRANSPORT SYSTEM IN THE RURAL AREAS AND FOOD SECURITY IN NIGERIA: A CASE OF AKINYELE LOCAL GOVERNMENT OF OYO STATE, NIGERIA

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ABSTRACT

Food production in Nigeria depends largely on subsistence farmers in the rural areas, where inefficient transport system remains a serious challenge and threat to food security in the country. This paper examines the effect of road transport system in the rural areas on food security in Akinyele Local Government Area of Oyo State, Nigeria. The study adopts a descriptive analysis, Multicollinearity and Cronbach Alpha Reliability tests as well as regression analysis on the primary data. Findings from the study reveal through the multicollinearity test, absence of significant correlation among the independent variables and the Cronbach Alpha confirms internal consistency of the variables. Furthermore, the regression analysis indicates that transportation infrastructure has a positive and statistically significant effect on food

security. More so, rural development and road network show positive significant effect on food security. Meanwhile, Market infrastructure and Security issues are not statistically significant to explain variations in food security. The paper therefore, recommends that governments should extend efficient road transport to the rural areas to facilitate the movement of agricultural produce from the village to the market and the industries. This will help to reduce wastes resulting from damage of farm produce due to the long distance to the city.

Keywords: Food, security, transportation, infrastructure, roads, market.

INTRODUCTION

The Food and Agricultural Organization, an arm of the United Nations, in its 2020 edition of the state of food and nutrition in the world, indicated that the fight against food insecurity and malnutrition in all its forms still remains a significant challenge, particularly, as billions of poor people are not able to eat healthily due to high cost of items and low affordability (Unicef, 2020).

In most sub-Saharan African countries, one of the major challenges facing the nations is how to ensure availability and affordability of food for millions of poor households. It is believed in Africa, particularly, West Africa, that when the problem of hunger is resolved, a major part of poverty is eliminated. Hence any attempt towards eliminating hunger in the society is an attempt towards poverty alleviation (Saheed, 2014). As such, governments across the continent over the years, have been looking for ways to solve the problem of food security across the continent.

In Nigeria, the national food production depends largely on farmers in the rural areas where they are the main producers and suppliers of food for the entire population, as the economy of the rural areas is predominantly primary production-based and mostly agricultural activities based. However, the challenges of poor infrastructure in rural areas create drawbacks and threatens the overall food security in Nigeria. Many of the farmers live in the rural areas and engage in subsistence farming, lacking in quality infrastructure like transportation system needed to access market, reduced production costs and

effective response to market demands. Effective transportation system would bring the rural areas closer to urban centres economically. More so, the areas with effective transport network tend to experience increased production, easy access to markets, linking final producers to sources of raw materials, promoting regional integration and ultimately, improving global economy linkages (Export-Import Bank of India, 2018).

Poor roads and ineffective transport infrastructure have long been a major challenge for African trade, and are the major factors affecting the continent's competitiveness in the global market system (Donald, Jinhage & Verhoogen, 2017). An effective transport system would allow easy conveyance of farm inputs like labour and other equipment to the farm in the rural area where they can be used to improve their productivity. Furthermore, farm produce, some of which are perishable in nature, need to be transported in large quantity at a low cost and in a good time to meet the industrial and household demands. However, effective road transport infrastructure is critical to food availability, accessibility and affordability by every household.

As part of government effort to improve the country's transport infrastructure, the Nigerian government established the Directorate of Food and rural Infrastructure (DFRRI) in 1985, which significantly contributed to the rural areas development. For example, among the several achievements of the programme was the completion of over 278,526 km of roads between 1986 and 1993. Besides, the rural electrification programme of the agency benefitted more than 5,000 rural communities. This integrated approach to rural development, made available for the necessary basic infrastructure that can contribute to the growth of agro-allied small-scale enterprises in rural areas. More so, DFRRI assisted in the aspect of food production. For instance, between 1986 and 1993, the agricultural production index indicated that there was a substantial increase in agricultural output. The Directorate, however, could not meet many of its objectives as a result of low or lack of standards for project harmonization and effective mechanisms for co-ordination among the three tiers of government and between governments and DFRRI among other factors, until it was consequently abolished.

Consequently, many rural areas across the country are still disconnected from the urban centres and markets due to bad roads. Many farmers

trek several kilometers to and from the farm, with the women carrying heavy loads of the harvests on their heads from the farm all the way to the local markets. Due to the unmotorable conditions of the roads, many transporters often avoid the rural areas and the few ones that take the pains to ply the roads charge exorbitant fares, which add to the cost of production and lead to increase in food stuff prices. Again, the issues of kidnapping and Herdsmen-Farmers crises are some of the security challenges that have been threatening food security in Nigeria. Farming activities in some parts of the country have been put to a halt as farmers in these affected areas have to stay away from their farms. The resultant effect is an acute shortage of farm produce supply to the market. Furthermore, the increasing waves of kidnapping and armed robbery on highways as a result of bad roads in the country is also preventing transporters from plying some of the rural areas, as many kidnappers and bandits take advantage of the dilapidated state of the roads. This has made difficult, the mobility of farm labour and food crops from the rural areas to the market. Rural markets world-wide, reflect the local culture and economy of the particular community it is located and serve as focal points of rural interactions where people from neighbouring villages meet to get their households food supplies. However, such market is lacking in most of the rural areas in Nigeria and the few that exist are not accessible due to bad road network.

The objective of the paper therefore, is to critically examine the effect of rural transportation infrastructure on food security in Nigeria, with a particular focus on Akinyele Local Government Area of Oyo State, Nigeria. To this end, the study is arranged in five sections. Following the introduction, section two of the study presents the review of some related literature and theoretical framework on the subject matter. The third section presents the methodology. The analyses and interpretation of the data make up the fourth section. The fifth section summarises the study and offer some policy recommendations.

LITERATURE REVIEW

Conceptually, infrastructure is the general term for the basic physical systems, like communication networks, water supply, electricity, road network and transportation system. These systems are actually capital intensive and involve high investment costs. However, they are vital to the functioning of the country, the growth and development of the

economy (Chappelow, 2020). Consequently, the Export-Import Bank of India (2018), considers transportation as a network industry which consists of complementary nodes and links that show increasing returns to scale and scope in production. It plays a very important role in the economic transformation of the rural areas and its access to urban markets, which is a major determinant of rural development. According to OECD (2013), transport infrastructure is an important input in production of transport services, which in turn, are essential factors necessary for easy exchange of final goods including food items in the market and raw materials for industries. Transport infrastructure is considered the backbone of modern economy and plays an important role in food security.

Meanwhile, the concept of food security has continuously been modified to reflect the food problems being faced by different parts of the world. For instance, United Nation (1974) at its World Food Summit views food security as adequate supplies of basic foodstuffs to sustain a steady growth of food consumption as well as to offset the fluctuations in food production and prices. FAO, in 1983, modified the concept of food security to include securing access to food supplies by vulnerable people. In other words, food security is to ensure that all people have both physical and economic access to the basic food that they need at all times. In their case, there should be a balance between the demand for food and supply side of the food.

Again in 2002, the understanding of food security was redefined as a condition that ensure all people have physical, social and economic access to sufficient, safe and nutritious food in line with their dietary needs and food preferences for an active and healthy life at all times (FAO, 2002). Hence, to achieve food security anywhere, the transport infrastructure plays the key role in access to food. Theoretically, the study is anchored on Access Theory which differentiates between a right to access resources and ability to benefit from it. The theory holds that one may have the right to access certain resources but may not have the ability to use the resources due to lack of structural and relational mechanisms like capital, market mechanism, knowledge and infrastructure (Ribot & Peluso, 2003 in Mutea, Rist, & Jacobi, 2020). In the context of food security, the farmers may have the capability to produce enough food for the people and the people may also have the right and capability to afford it, however, the ability to benefit from it depends on availability of transport infrastructure to

convey the food from the farm in the rural area to the market or final consumer.

Empirically, Ogunleye, Ajibola, Enilolobo & Shogunle (2018) adopt Granger Causality and Ordinary Least Square approaches to investigate the road transport infrastructure's impact on agricultural sector development in Nigeria within the period of 1985 and 2014. The findings reveal a positive and statistically significant relationship. The results further confirmed a unidirectional causality relationship from agricultural sector development to transport infrastructure. Gbam (2017), assesses the implication transportation on the marketing of agricultural produces in some selected markets in Jos North Local Government Area, Plateau State. Survey research method was employed, with frequency tables adopted for data presentation. The study reveals the importance of transportation in the distribution of agricultural products, creating market for agricultural product, as well as, in minimising waste of farm products. The study reveals further that improvement of transportation infrastructure encourages farmers' productivity.

On his part, Ajiboye (2016) examines how transportation systems affect food marketing and security in Nigeria by using a primary data sourced from 300 respondents selected randomly and analysing using a frequency table and percentage distribution of the research variables. The findings reveal that the shortage of transportation facilities, high transport cost and wastage resulting from ineffective storage and processing facilities, adversely affected food security in the study area. Orakwue, Umeghalu & Ngini (2015) also assess road transport's effect on agricultural productivity in Ayamelum Local government area of Anambra State. The study adopted descriptive and graphical methods on the primary data obtained through structured questionnaires administered to about twenty rural farmers in the study area. The results indicate that road transport has positive effect as well as negative effect on agricultural development.

In another study, Selepe, Sabela, & Musuku, (2014), assess the implication of infrastructural inadequacy on food security in Ntambanana, KwaZulu-Natal, South Africa. The study adopted primary data subjected to econometric analysis to test for the reliability of information obtained from the respondents. The findings indicate that poor infrastructure, inadequate support and bad road network are hindering smooth access to market facilities. More so, inefficient and

ineffective transportation system negatively affected the small-scale farmers productivity in the area. Baek (2014) examines the effect of public transportation accessibility on food security for households in the United States of America. Using a data set sourced from the population survey, food security supplement and the National Transit Database for the period of 2006 to 2009, the results reveal a negative causal effect of public transportation accessibility on food insecurity. On their part, John, Lisel & O'Dwyerb (2009), examine the effects of mobility and location on food access. The study adopted an in-depth interview approach and the results revealed that living in a food desert did not, itself, impose food access difficulties, but more important was the access to independent transport to shops.

In the same vein, Tunde and Adeniyi, (2012), further examine the implication of road transport on agricultural development in Ilorin East L.G.A of Kwara State by using descriptive and analytical statistical methods. The study found out that the farmers' income and productivity in the area are negatively affected by high transportation cost resulting from bad condition of the roads. Meanwhile, Orji, Doki and Jatto (2010) by using descriptive analysis, study the effectiveness of good road network in resolving the rural-urban drift problem in Nigeria. The findings reveal that good road network in the rural areas significantly improves the income of the rural dwellers and the government.

METHODOLOGY

Area of Study

Akinyele Local Government Area is one of the local government areas that makeup Ibadan metropolis in Oyo State with an estimated population of 239,745 (Oyo State Government, 2017). Ibadan is strategically located with freeways linking it to other states of the country, like Lagos to the South West, Ogun State to the South, Oyo, Ogbomosho and Ilorin in Kwara State to the North, while Osun State is to the East of the city. The main occupations of the Akinyele local government area populace include farming, trade, food processing and wood carving. The farmers, who principally engage in subsistence farming cultivate cash crops like cocoa, palm oil and kolanuts and food crops include cassava, yam, cocoyam, maize and plantain. The women engage in food processing like cassava processes into garri

and yam flour while some engage in trading farm produce. Among the notable agricultural institutions in the area is the International Institute of Tropical Agriculture (IITA) which has extensive grounds for crop and agricultural researches into key tropical crops including banana, plantain, maize, cassava, soyabean, cowpea and yam. The institution is key to attainment of food security, not only for the state but the country as a whole.

In terms of transportation, modes of transport include, trucks, cabs and taxis including taxi-vans popularly referred to as *Danfo*, facilitating movement of people and goods within and outside the state. The major foodstuff markets in the local government area are the Ojo Market, Shasha Market and Moniya market. The markets are located close to the Oyo-Ogbomoso-Ilorin interstate road network, which allows farmers from Northern Oyo State and from the Northern part of Nigeria, including cattle traders, easier access to transport their produce to the market.

Research Design

The descriptive research design was used in this study and the survey method was specifically applied. The approach consists of a set of structured questionnaires developed on 5-point Likert-scale to obtain information from the selected sample of the population of rural community in Akinyele local government area of Oyo State. However, it would be unrealistic to study this large group of people whose population may be undetermined due to inaccessibility of information. Therefore, a sample of 399 respondents was selected from the population across the Local government area, using Yamane (1973) statistical formula. The study utilized mainly primary data obtained through the administration of questionnaire. In order to collect the data, the researcher adopted a personal and on the spot delivery and recovery approach during the administration of the instrument. A total of 399 questionnaires were distributed, and out of this number, 300 of the retrieved questionnaires provided the required information.

Model specification

In order to assess road transport system's effect on the development of the agricultural sector, the conceptual framework was developed

by Ogunleye, Ajibola, Enilolobo and Shogunle (2018) and stated as follows:

AG = *f*(RT, EX, K) ----------(1)

Where;

AG = Agricultural output proxy by GDP of agricultural sector

RT = Road Transport Infrastructure proxy by the length of paved road per square kilometer of area.

EX = Export

K = Capital

The model is then modified as follows:

FS = *f*(TI, RN, MK, SI).....(2)

Modifying equation (2) in stochastic form as:

$FS = \beta_0 + \beta_1 RD + \beta_2 TI + \beta_3 RN + \beta_4 MK + \beta_5 SI + \mu$ …….....(3)

Where:

FS = Food Security

RD = Rural Development

TI = Transportation Infrastructure

RN = Road Network

MK = Market Infrastructure

SI = Security Issues

Method of Data Analysis

The primary data obtained were coded and analyzed using descriptive statistics and inferential statistics. Econometrics tools like multicollinearity, Cronbach Alpha for reliability test and multiple regression analysis were adopted in analyzing the data. Thereafter, both quantitative and qualitative data are triangulated for better research results with the help of STATA 13 software package.

EMPIRICAL RESULTS AND DISCUSSION

The results of descriptive analysis are reported in this section.

The descriptive statistics shown in Table 1, reveals that variables Food Security (FS), Transport Infrastructure (TI), Road Networks (RN), Market Infrastructure (MI) and Security Issues (SI) have a mean of about 3.5, with minimum of 1 and maximum of 5, except for Food Security with a minimum of 1.3. Road Development variable

has a mean of about 4.4 with minimum of 1 and maximum of 5, while Security challenges variable has a mean of about 3.4 and maximum of 4.5. The standard deviations of all the variables, except for the transport infrastructure are less than one, indicating that the individual responses are concentrated around the mean. In other word, they are less than one point away from the mean.

Table 1

Results of Descriptive Analysis

Variable	Observation	Mean	Standard Deviation.	Minimum	Maximum
FS	300	3.596	0.737	1.3	5
RD	300	4.430	0.813	1	5
TI	300	3.337	1.106	1	5
RN	300	3.582	.0891	1	5
MK	300	3.560	0.932	1	5
SI	300	3.408	0.818	1	4.5

STATA 13 Outputs

Table 2

Results of Reliability Test using Cronbach Alpha

Item	Observation	Sign	item-test correlation	item-rest correlation	average interitem covariance	Alpha
FS	300	+	0.580	0.390	.172	0.562
RD	300	+	0.473	0.235	.197	0.613
TI	300	+	0.743	0.503	.117	0.497
RN	300	+	0.527	0.260	.185	0.609
MK	300	+	0.554	0.307	.177	0.589
SC	300	+	0.625	0.422	.158	0.546
Test scale					.168	0.617

STATA 13 Outputs

The Cronbach Alpha test shows the internal consistency or the reliability of the data. The results in Table 2 show alpha coefficient of the variables to be 0.617, suggesting that the variables have internal consistency and can be affirmed to have good reliability. The implication of the result is that the test actually measures the effect

of all the independent variables (RD, TI, RN, MK and SI) on Food Security (FS).

Table 3

Results of VIF & Tolerance Level

Variable	VIF	1/VIF
SC	1.25	0.802
TI	1.18	0.845
RD	1.16	0.865
RN	1.14	0.875
MK	1.08	0.923
Mean VIF	1.16	

STATA 13 Outputs

The results of the multicollinearity test in Table 3 reveal that the VIF for all the variables is closer to 1, which is an indication that there is absence of high correlation among the independent variables. Hence changes in any of the variables cannot be attributed to shifts in another variable.

Table 4

Results of Regression Analysis

FS	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
RD	.230	.042	5.44	0.000	.147	.314
TI	.400	.032	12.69	0.000	.338	.462
RN	.089	.038	2.31	0.022	.013	.164
MK	.051	.036	1.43	0.153	.019	.121
SI	.043	.044	0.99	0.322	-.043	.130
_cons	.870	.216	4.03	0.000	-.049	1.237
Prob > F = 0.000						
R^2 = 0.4446						
Adj R^2 = 0.4351						

STATA 13 Outputs

The results in Table 4 reveal the effect of Transport Infrastructure and other Independent variables, including Rural Development, Road Network, Market Infrastructures and Security Issues, on Food

Security in Akinyele Local Government Area of Oyo State, Nigeria. The results reveal F-stat value of 0.0000, indicating a very good fit for the regression model, and all the variables' (RD, TI, RN, MK and SI) coefficients are jointly statistically significant. Besides, the R-Square indicates that about 44.5 percent of the variation in food security can be explained by factors in the model, while about 55.5 percent can be attributed to other factors outside the model.

Furthermore, the results also reveal that Transportation Infrastructure (TI), with a coefficient of 0.400, t-stat of 12.69 and p-value of 0.000, has a positive and statistically significant impact on food security. It implies that when all other factors remain constant, one percent improvement in transportation infrastructure will tend to improve food security by about 0.4 percent. The results also indicate that the coefficient of the rural development (RD) variable is 0.23, with a t-value of 5.44 and p-value of 0.000. It follows that rural development has a positive and statistically significant effect on food security. Hence, any rise in rural development by one percent, will likely improve food security as much as 0.23 percent, provided all other variables remain unchanged. More so, Road Network shows a coefficient of 0.089, with a t-statistical value of 2.31 and p-value of 0.022. The result reveals that road network also has a positive and statistically significant effect on food security. It implies that if all other factors remain constant, one percent improvement in the road network will bring about increase in food security as much as 0.089 percent.

Market infrastructure shows a coefficient of 0.051, t-value of 1.43 and p-value of 0.153, thereby indicating that market infrastructure has a positive but statistically insignificant effect on food security in Akinyele local government area of Oyo State. Meanwhile the security issues variable with a coefficient of 0.043, has a t-statistical value of 0.99 and p-value of 0.322, indicating that security issues have a positive and statistically insignificant effect on food security in the area of study.

DISCUSSION OF FINDINGS

From the analysis of the primary data obtained, the results reveal that transportation infrastructure has a positive and statistically significant

effect on food security in Akinyele Local Government Area of Oyo State, Nigeria. The results converge to *apriori* expectation, in the sense that transportation infrastructure in the rural area shows a strong effect on food security, as it makes it easy for the farmers to convey farm inputs including labour and harvests from the farm to the local market for easy accessibility by consumers. More so, effective transportation infrastructure will reduce the cost of transportation, which will affect the prices of food items, and consequently increasing affordability among the consumers. The results agree with the results obtained from the work of Ogunleye, Ajibola, Enilolobo and Shogunle (2018) who confirmed a positive relationship between transport infrastructure and agricultural development in Nigeria.

Road network in the rural area has a positive and statistically significant effect on food security in the study area. Expectedly, good road network will open-up rural areas for easy access and movement of farm produce from the farm in the rural area to the local market, thereby making food accessible to the final consumers in other parts of the state within the shortest possible time. The findings converge with the findings of Orji, Doki and Jatto (2010) who observed that good road network in the rural area has a positive relationship with the rural dwellers income.

Market infrastructure is expected to provide avenue for exchange of goods between the producers, who in the context of the study, are the farmers and the potential buyers or consumers. However, the findings from this study indicate that market infrastructure is not statistically significant to explain any variation in food security in the area of study. The result is not in line with prior expectation and this can be attributed to the fact that most farmers in the area of study do sell their products from their houses without necessarily getting to the market. Some consumers may also choose to purchase the farm produce directly from the farm where the prices are often cheaper than the market places.

The results further indicate that security issues, though show positive signs, however, are not statistically significant enough to explain the variation in food security in the study area. This can be attributed to the fact that the study area has not been experiencing any serious security challenge that would have disrupted farming activities in the area.

CONCLUSION AND RECOMMENDATIONS

The paper investigated the effect of transportation infrastructure on food security, with specific objectives to assess the effect of rural development, road network, market infrastructure and security issues on food security in Akinyele local government area of Oyo State, Nigeria. Based on the results obtained from analysis of the primary data collected from the study area, it was observed that all of the variables, except market infrastructure and security issues, are statistically significant in explaining food security. Hence, it can be concluded that transportation infrastructure in the rural areas has a positive effect that is statistically significant on food security.

Given the foregoing, the study, therefore, recommends thus:

1) Considering the importance of transportation in achieving food security in the country, it is necessary for the government and the private sector to extend transportation infrastructure to the rural areas, in order to bridge the distance with the city centres. The railway route can be extended to the rural areas to facilitate the movement of agricultural produce from the village to the market and the industries. This will help to reduce waste resulting from damage of farm produce due to the long distance to the city. Apart from the mass transits in operation within the city, there should also be provision for trucks and vans to enable the rural farmers convey their agricultural produces from the farm to the market at a cheaper fare.
2) Many of the rural areas lack access roads, and the few ones available are in terrible shape, which discourages commercial transporters from plying the routes, hence, the few ones who choose to do so charge high fares, which in turn affects food prices. Therefore, construction of new roads and repairing of the existing ones in the rural areas should be carried out regularly by the state government when the need arises, to create easy access, and facilitate easy movement of farm inputs and harvest from the farm in the rural area to local markets for accessibility by consumers.
3) Market infrastructure is one of the means through which rural producers can get their products across to the consumers in exchange for money and also means to obtain other essential goods or services for their wellbeing. Hence government should establish standard agricultural markets in the rural

communities. This will make it easier for the rural dwellers to move their products from the farm to the market and also encourage urban-rural movement rather than rural-urban migration.

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REFERENCES

Ajiboye, A. O. (2016). The effect of transportation system on food marketing and security in Nigeria. *Journal of Logistic and Transport*, *4*(1), 53-68.

Baek, D. (2014). The effect of public transportation accessibility on food insecurity. *Eastern Economic Journal. 42, 104-134.* https://doi.org/10.1057/eej.2014.62.

Chappelow, J. (2020). Infrastructure. *Investopedia*. https://www.investopedia.com/terms/i/infrastructure.asp

Donald, D., Jinhage, A. & Verhoogen, E. (2017). Beyond borders: Making transport work for African trade. International Growth Centre (IGC). http://igc.sbx.so/reader/beyond-borders-making-transport-work-for-african-trade/poor-roads-increase-cost-transporting-goods-long-distances-factors-may-significant/

Export-Import Bank of India (2018). Connecting Africa: Role of infrastructure. *Working Paper Series*, No. 27.

FAO (1983). *World Food Security: A Reappraisal of the Concepts and Approaches.* Director General's report. Rome.

FAO (2002). *The State of Food Insecurity in the World 2001.* Rome.

Gbam, B. (2017). Effect of transportation on the marketing of agricultural in Jos North. *Journal of Research in Business and Management, 5*(2), 99-106.

John C, & Lisel A. O'Dwyerb (2009). Effects of mobility and location on food access. *Health & Place, 15,* 45–55.

Mutea, E., Rist, S., & Jacobi, J. (2020). Applying the theory of access to food security among smallholder family farmers around North-West Mount Kenya. *Sustainability*, *12*(5), 1751. MDPI AG. Retrieved from http://dx.doi.org/10.3390/su12051751

OECD (2013). Understanding the value of transport infrastructure. *International Transport Forum, Task Force Report.*

Ogunleye, O., Ajibola, A., Enilolobo, O. & Shogunle, O. (2018). Influence of road transport infrastructure on agricultural development in Nigeria. *Logistics & Sustainable Transport, 9*(1)*,* 39-50.

Orakwue, C. O., Umeghalu, I. E. & Ngini, J. O. (2015). Effects of road transport on agricultural productivity: A case study of Ayemelum Local Government Area of Anambra State, Nigeria. *International Journal of Applied Sciences and Engineering. 3*(1)*,* 1-4.

Orji, T., Doki, N. & Jatto, P. T. J. (2010). Rural-urban drift and road infrastructure in Nigeria. *Mkar Journal of Inter-Disciplinary Study*, *1*(1), 164-178.

Ribot, J. C. & Peluso, N. L. A. (2003). Theory of Access. *Rural Sociology. 68*, 153-181.

Saheed, Zakaree S. (2014). Impact of agriculture credit guarantee scheme fund (ACGSF) on domestic food supply in Nigeria. *British Journal of Economics, Management & Trade, 4*(8)*,* 1273-1284.

Selepe, M., Sabela, T. & Musuku, M. (2014). The effect of infrastructural challenges on food security in Ntambanana, KwaZulu-Natal, South Africa. *African Journal of Hospitality, Tourism and Leisure, 3*(1) - *(2014) ISSN: 2223-814X.*

Tunde, A. & E. Adeniyi, (2012). Impact of road transport on agricultural development: A Nigerian example. *Ethiopian Journal of Environmental Studies and Management, 5*(3),1-7.

Unicef (2020). The state of food security and nutrition in the world 2020. https://www.unicef.org/reports/state-of-food-security-and-nutrition-2020

United Nations (1975). *Report of the World Food Conference, Rome 5-16 November 1974.* New York.

Yamane, T. (1973). *Statistics: An Introductory Analysis*. 3rd Edition, Harper and Row, New York.