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The Roles of Transportation Systems in Food Security and Stability in Osun State, Nigeria

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ABSTRACT: *Transportation plays an important role in the development of a nation. It is regarded as a tool for the economic development of a nation. The peace and stability of the globe depend on the ease of social interaction and trade across nations. The issue of food insecurity affects the stability of a nation. Thus, this study examines the role of transportation systems in food security and stability in Osun State, Nigeria. This study adopts a survey research design in which secondary and primary data are both utilised. The result shows that the correlation coefficient (r) is 0.927 and the coefficient of multiple determinant (r^2) is 0.893. It simply means that above 86% of the variation in independent variables may be attributed to a magnitude increase in the dependent variables, which are factors influencing the mobility of food items. Also, the F ratio, which is 146.193, was statistically significant at p value = 0.00. These factors are poor and inaccessible roads, accidents, theft, breakdown of vehicles, banditry, and harassment of traders. The study concluded that transportation systems play a crucial role in enhancing the mobility of food items to various markets. It was recommended that all roads should be greatly improved to enhance accessibility. More security personnel should be deployed on Nigerian roads to discourage food theft and banditry. Also, numerous levies against food traders should be reduced so that the prices of food items (groceries) can be affordable.*

KEYWORDS: Transportation systems, food security, accessibility, stability

INTRODUCTION

Transportation plays a crucial role in the development of a nation. It is regarded as a tool for the economic development of a nation. The peace and stability of the globe depend on the ease of social interaction and trade across nations. Each region is connected to the rest of the country by the transportation sector, which supports growth and creates open corridors, port links, and tourist destinations (Rudra, 2010). The ability to provide an enhanced, efficient, effective,

economical, accessible, safe, dependable, and integrated transport system that will prosper the nation's economic, social, and political sectors is the ability to develop transportation in the overall activities of a nation. Since the sector is not productive on its own and is instead responsive to pressures generated in the production and consuming sectors, all these roles constitute transportation, not an end but a means to fulfil other purposes. Transportation is an important component in the function of any developed or developing nation. It influences the location of both essential services and human activities. Production of goods and services, residence, leisure, commercial and other social facilities/land depends on transportation. It serves as the nerve and basic requirement for every emerging economy (Adesanya, Philip and Titilayo, 2000). Fryer (1965) asserted that transportation is intimately linked with both production and trade that is very often difficult to separate the activities from one another. Efficient and effective transport system is indispensable to the progress of any emerging economy. Transport infrastructure provides accessibility for agricultural produce from the farmland to the local markets and outward via export to other nations. Transport is inevitable in the movement of food circulation. Inadequate transport infrastructure affects food circulation and its safety in developing countries. It plays a crucial role in food security as it provides access, or pathways, from the production to the final consumers. Inadequate transport infrastructure often disrupts food circulation. Hence, leading to food insecurity. Hunger, malnutrition, or mass starvation exist when there is food insecurity (Gordon, 1999). Insufficient transportation has slowed down or prevented the delivery of supplies to farmers, raising the cost of these goods. Through its impact on the production and sale of non-food items—the inability to market a surplus means lower revenue and fewer food purchases—inadequate transit has also indirectly contributed to food insecurity.

Nigeria being a developing nation acknowledged the importance and need to develop an efficient, effective, and reliable transportation system via its National Development Plans. The first national development of 1962-1968 consider agricultural development as its priority. Also, the Directorate of Foods, Roads, and Rural Infrastructure (DFRRI) came into existence into existence in the late 1980s, constructed 60, 000 kilometres of roads to compliment the National Development plan of 1975 to 1980. Ocheni and Nwankwo (2012) asserted that these programmes were made to bridge the farm and the urban centres. Other government programmes on agriculture includes River Basin Development Authorities (RBDA), Operation Feed the Nation (OFN), Agricultural Development Programme (ADP), National Agriculture Land and Development Agency (NALDA) etc. (Usman, 2014).

Roads in Nigeria, especially the rural areas lack adequate feeder roads connecting the farms, rural-rural settlements, and rural-urban transportation networks. Most of the existing roads are untarred and are prone to erosion during raining season. Other roads furniture such as bridges and culverts linking rural settlements also comes under severe pressure and are, thus, rendered unpliable and inaccessible (Ogunowo and Oderinde, 2012). The issue of insecurity on Nigerian roads when transporting agricultural produce from the rural area to the urban center or from the northern region to the southern region of Nigeria. Olayide and Babatunde (2020) examined rural accessibility and movement of farm of farm produce to urban areas in Ejigbo, Local Government Area, Osun state, Nigeria. Badejo (2018) evaluates the perspectives on freight and

logistics quagmire taking Nigeria as a case study, but this paper unravels the role of transportation on food security and National stability.

LITERATURE REVIEW

Concept of transportation systems

A transportation system is referred to as the combination of elements and their interactions, which results in the demand for travel within a specific area and the provision of transportation services to meet this demand. It can be regarded as the set of relationships between nodes, networks, and demand. These relationships involve flows between locations spatially representing this demand, infrastructures designed to manage and link these flows, and locations themselves. All elements of a transportation system are designed to make it easier for people, goods, and information to move from one place to another. The node is the point in a transportation system where movements start, stop, and transit (intermediary).

They range from local nodes (like a transit station) to global nodes, depending on the geographic scale being examined (such as port or airport terminals). The network is made up of several links that represent the connectivity between locations and the capacity to carry large volumes of passengers or cargo. A strong transportation infrastructure helps and supports a country's development. Poor transportation infrastructure impedes a country's ability to develop and thrive. Inefficiency in the transportation system, according to Adeniji (2000), prevents and delays the movement of local goods to domestic and international markets, raises final prices, and therefore lowers the competitiveness of Nigerian agricultural exports.

Usman (2014) believed that the Nigerian transportation system was never intended to expand to accommodate rising demand. Design defects that cause traffic congestion, excessive facility use, and an obvious systematic deterioration of the Nigerian road network are major causes for concern. These factors have significantly contributed to the rapid devastation and inefficiency of the economy. When it comes to protecting lives and property when using any type of transportation system, safety has no equivalent. Accidentally lost lives are typically irreplaceable, and if they can be replaced—as with goods—additional expenditures may result, defeating the investment's goal. Safety is of great importance and the measures are inevitable against pilferage, rain, heat, contamination, fire, theft, rust, breakages, rot, accidents, and wilful damage during loading and unloading processes, and transport in motion (Ehikwe, 2002).

Concept of Accessibility

Regional development, spatial analysis, and transportation are strongly correlated, so it is necessary to merge the two opposing approaches more effectively. Although the term "accessibility" is widely used, its definition and formulation are not universally agreed upon. Over the years, a substantial number of research and working papers about transportation accessibility challenges have been generated. On this topic, fresh research and useful strategies are always being developed. The net economic costs of moving products and services from one place to another were examined using the accessibility concept. It speaks to how simple it is to

go to locations for goods, services, and activities, all of which are referred to as opportunities. The potential of interaction is conceived to be accessible (Lithman, 2003).

The ease with which activities can be reached from a certain location and using a particular mode of transportation is a common definition of accessibility (Morris, Dumble, and Wigan, 1979; Johnston, Gregory, Pratt, and Watts, 2000). The concept often combines two factors: the location on a surface in relation to relevant destinations and the features of the transportation network (Vickerman, 1974). The European Observation Network, territorial development, and cohesion all depend greatly on accessibility. To improve the decision-support tool and make it easier for decision-makers to establish the appropriate relationship between policy objectives and transportation policy measures, it offers a wide range of indicators that define the transportation system and its spatial consequences (Linneker, 1977).This research paper's central theme is geographic accessibility. Poor accessibility was a major barrier to Nigeria's economic development. Additionally, expensive transportation makes agricultural products less competitive on the market, which discourages increased production (Ajiboye and Afolayan, 2009).

Concept of food security

As evidenced by the numerous attempts made to define it in research and policy applications, food security is a flexible concept. The early 1970s saw a number of worldwide food crises. That was when the idea of food security first emerged. The Food and Agriculture Organization's (FAO) annual report on food security, "The State of Food Insecurity in the World 2001," provided the definition of food security that is currently widely used: When everyone, at all times, has physical, social, and economic access to enough safe and nutritious food that satisfies their dietary needs and food preferences for an active and healthy life, this scenario is said to be one of food security (FAO, 2002). At the 2009 World Summit on Food Security, a fourth dimension, stability, was added to this concept as a short-term time indicator of the ability of food systems to absorb shocks, whether natural or artificial (FAO, 2009). Famine, hunger, and food crises have occurred, necessitating a definition of food security that takes into account the vital needs and actions of potentially susceptible and impacted individuals (Shaw, 2007) Food security was then described as "[the] availability at all times of an adequate world food supply of essential commodities to maintain a steady expansion of food consumption and to offset variations in output and pricing" during the 1974 World Food Conference (United Nations, 1975).

METHODOLOGY

The capital of Osun State is Osogbo in Nigeria. It was chosen as the capital of Osun State in 1991. Osogbo City serves as the administrative hub for both Olorunda and Osogbo Local Government Areas (situated in the Igbonna Area of the city). It is accessible by road about 88 kilometers to the northeast of Ibadan. Additionally, it is 67 km (48 mi) south of Ilorin in the state of Kwara and 108 km (67 km) northwest of Akure. Due to its strategic location within the state, Osogbo is easily accessible from all other areas and shares borders with Ikirun, Ilesa,

Ede, Egbedore, Osogbo, Ogbomosho, and Iragbiji. This study adopts a survey research design. For the purposes of this study, secondary and primary data were both utilised.

RESULT

Table 1 shows the socio-economic characteristics of the respondents. 47% were traders by profession in the local markets and 53% of the respondents were transporters. Most of the population were transporters. 60% of the respondents were male and 40% were female. This shows that majority of the population were male which constitute the population of the study. Those that are within the age range of 26-40 years constitute 40% of the population of this study. This shows that most of them are young and still in their active years, followed by those within the age range of 41-50 years which constitute 30% of the population. Those who are married constitute 80% of the population and those who had first school leaving certificate are predominant and constitute 47% of the population. It simply means most of the traders and transporters had First school leaving certificate. About 33% of the respondents earned about N40,000 or less monthly. This income is low considering the marital status of the respondents who are married and as well responsible for the wellbeing of their various families.

RESULTS AND DISCUSSION

Table 1: Characteristics of distribution of respondent

Characteristics of respondents	Frequency n=150	Percent %
Profession		
Traders	70	47
Transporters	80	53
Sex		
Male	90	60
Female	60	40
Age		
18-30	10	7
26-40	60	40
41-50	45	30
Above 50	35	23
Marital status		
Single	10	7
Married	120	80
Divorced	8	5
Widow/widower	12	8
Educational Qualification		
First School leaving Certificate	70	47
SSCE	40	27
NCE	20	13
OND	10	7
HND	5	3
B.Sc. above	5	3

Monthly income (₦)		
Less than 20,000	35	23
20001-30000	25	17
30001-40000	50	33
40001-50000	19	13
50001 and above	21	14

Source: Author's fieldwork, 2022.

Transportation Networks in Osogbo

Trunk 'A' (Federal Roads), Trunk 'B' (State Roads), Trunk 'C' (Local Government Roads), and DFRRI Roads are the four classifications of roads that serve Osogbo. Most of the paved federal roads are in poor condition, most of the paved state roads are in fair condition, most of the paved local roads are unpaved, and only a small percentage of the DFRRI roads are in good shape. The 27.2 kilometers of trunk "A" roads in Osogbo township are 8.0 meters wide. The 16.90 kilometers of state roads range in width from the 7.3-meter-wide Oja Oba/Osun River and Sabo/Ayetoro to the 8.0-meter-wide Aromole/Kajola streets to the 32.0-meter-wide Okefia/Alekuwodo/Odo Olowo/Ita Olookan dual carriageway.

There are 102.5 kilometers of Trunk "C" (local government roads), only some of which are tarred. Most of the tarred ones lack drainage and aren't even smooth. Some of them aren't even motorable, and they have terrible connections. The DFRRI roads are largely untarred. They are 7.3 m wide and total 176.14 km. The remaining 105.84 km are untarred, leaving only 70.3 km covered in asphalt. The hinterlands and suburban communities are served by these highways.

Tables 2 and 3 provide a summary of Osogbo's roadways by type, quantity, length, breadth, and state.

Table 2: Roads Types, Numbers and Distances in Osogbo

S/N	Road Type	Number	Total Length (Km)
1	Federal Roads	3	18.50
2	State Roads	6	16.90
3	Local Government Roads	58	102.50
4	DFRRI Roads	20	176.14
	TOTAL	77	314.04

Source: Memorandum on Planning Proposals for Osun State and Osogbo Local Government (1999)

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Table 3: Road Types by Conditions

S/N	Road Type	Road Conditions and Distance Covered			
		Tarred	Distance (Km)	Untarred	Distance (Km)
1	Federal Roads	3	18.50	-	-
2	State Roads	4	9.90	2	7.0
3	Local Government Roads	19	20.30	39	-
4	DFRRI Roads	1	-	20	-
	TOTAL		50.70	61	-

Source: Memorandum on Planning Proposals for Osun State and Osogbo Local Government (1999).

Table 4: Analysis of challenges encountered while transporting food items to the local market

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.571	.176		3.251	.001
	Accidents	.504	.106	.366	4.775	.000
	Theft	-.699	.150	-.575	-4.667	.003
	Banditry	.250	.076	.321	3.281	.004
	Breakdown of vehicles	.144	.214	.137	.672	.001
	Harassment	.121	.106	.121	1.141	.003
	Poor and Inaccessible Road	.566	.196	.577	2.884	.000

Source: Author's fieldwork (2022)

Table 4 above shows that poor and inaccessible road, accidents, theft, breakdown of vehicles, banditry and harrasment are factors hindering the mobility of food items in Osogbo with which their p values is lesser than 0.05.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.927[a]	.860	.854	.32076

a. Predictors: (Constant), inaccessible road, accidents, banditry, Harassment, theft, breakdown

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Table 6: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	90.247	6	15.041	146.193	.000[b]
	Residual	14.713	143	.103		
	Total	104.960	149			

b. Predictors: (Constant), inaccessibleroad, accidents, banditry, Harassment, theft, breakdown

Table 5 shows the correlation coefficient coefficient (r) of 0.927 and the coefficient of multiple determinant (r^2) of 0.893. It simply means that above 86% of the variation in independent variables may be attributed to a magnitude increase in the dependent variables, which are factors influencing the mobility of food items, while the remaining 14% accounts for the unexplained variable. Similarly, table 6 shows that the F ratio, which is 146.193, was statistically significant at p value = 0.00. The regression model overall predicts that the challenges encountered while transporting food item (groceries) to the local market are significant. Olayide and Babatunde (2020) believed that the poor nature of roads, frequent breakdowns, and high vehicular operating costs are factors influencing the mobility of farm produce from the farmland to urban centres. According to Abdullahi, Moukhtar, and Ibrahim (2019), findings show that food availability, accessibility, usage, and stability were identified as major contributors to food insecurity in Katsina state and have a big impact there.

CONCLUSION AND RECOMMENDATIONS

This study concluded that there are challenges facing food distribution and safety in Osun state. The study further outlines the role of transportation systems in enhancing the mobility of food items to various markets. Poor and inaccessible roads lead to accidents, which influence theft and banditry on the road. This hinders the mobility of food items (groceries) to various markets from the farm and other neighbouring cities. It was recommended that

1. Accessibility is of great importance; therefore, all roads should be greatly improved.
2. Poor or bad roads that often lead to accidents should be repaired to ensure the safe mobility of food items (groceries).
3. More security personnel should be deployed on Nigerian roads to discourage food theft and banditry.
4. Harassment of food traders should be discouraged, so as to ensure the availability of food at various markets.
5. Numerous levies against food traders should be reduced so that the prices of food items (groceries) can be affordable.

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