International Journal of Scientific Research in Multidisciplinary Studies
Vol.7, Issue.9, pp.01-10, September (2021)

Research Paper
E-ISSN: 2454-9312
P-ISSN: 2454-6143

Inter-Modal Access to Market Locations in the Littoral Corridor of Ondo State, Nigeria

I. Njoku[1*], B.S. Olisa[2], Y. Okubakeko[3]

[1,2,3]Department of Logistics and Transport Technology, Federal University of Technology, Akure.

**Corresponding author: injoku@futa.edu.ng, bsolisa@futa.edu.ng, +2348036645117; +2348101217379*

Available online at: www.isroset.org

Received: 16/Sept/2021, Accepted: 20/Sept/2021, Online: 30/Sept/2021

***Abstract*—**The availability and adequacy of installed parking facilities allow people to meet the ease of movement and traffic flow in public places like Market. Thus, properly located and well managed parking facilities will ease accessibility, and unrestricted accessibility to facilities can lead to unimaginable planning problems within a human society. Hence, this research was carried out to study inter-modal access to market locations in the littoral corridor of Ondo state. The research was conducted using questionnaire and filed observations. A total of 289 questionnaires were administered out of which 189 questionnaires were administered to all registered Associations market traders, commercial boat Operators, commercial vehicle driver associations and 100 questionnaires were administered randomly; 50 questionnaires for each of the two selected markets. Meanwhile, Pearson Product correlation was used to test for the relationship between shoppers' origin and market locations. Gravity model was used to find the degree of attraction and repulsion (interaction) between market locations and their catchment areas. Findings reveal that installed parking facilities are inadequate. In order to achieve provision and better management of the market parking facilities, policies are recommended. These include development of a parking lots and provision of more jetties, effective monitory, mandatory legislation and private-public sector participation.

Keywords— Accessibility, Market, Parking, intermodal, littoral, corridor

I. INTRODUCTION

Markets play a very vital role in the economic life of the people. Markets strengthen the economic base of a town and also sustain the tax base of local Authority, Nigerian cities, as in other nations of the world, generate abundant revenues for urban Government in terms of economic growth, wealth and development. However, development as conceived by Ayoade (2008) is when all activities of population characteristics are provided for with all necessary spatial facilities required for living and for making a living in the current and foreseeable future [1]. He further stated they should be arranged at appropriate locations in order to make an individual realize his or her personality at every level of need, with comfort, convenience and at affordable price. The above typifies one of the most reckoned and popular definitions of town planning by Keeble (1969) as "the art and science of ordering the use of land and the character and sitting of buildings and communication routes so as to secure maximum practicable degree of economy, convenience and beauty''

In Africa, the idea of place where people meet to exchange good and services for money has relationship with geographical, centrality and proximity to the ruler's palace which is often central, the open market system which still exists operate periodically. However, urban expansion and attendant commercial advancement, and the influence of market-oriented people to urban area, makes the formally periodically operated market to be patronized on daily basis. In developing countries, since the late sixties and seventies, planning advocates, have advised government to abandon their policy of direct redevelopment actions and instead focus on enabling communities and local authorities to choose and develop on any actions relating to development of community functions. In response to this many governments with the assistance of multilateral agencies focus on upgrading market, slum areas and providing service plot to the urban poor. The important role of transport infrastructure for regional development is one of the fundamental principles of regional economics. Accessibility is the main characteristic of a transport system that enhances the locational advantage of a place (a region, a city or a corridor) relative to other areas (Igor, 2015) [2]. The idea of the development of markets is therefore an attempt to transform the commerce potentials of the natural and traditional market to an organized market structure that is more sustainable and environmentally friendly. For the past few decades, the littoral corridor of Ondo state has been experiencing huge population increase which is due to the rapid urbanization and high rate of rural- urban immigration.

The provision of judiciously managed functional parking facilities located in high density areas such as motor parks, markets and open spaces will consolidate hygienic efforts of the government in respect of the mega-city concept and significant reduction in health-related problems (Asabia, 2011) [3]. Therefore, this study aims to assess the

prevailing accessibility constraints to market locations in littoral corridors of Ondo state with a view to identify ways of improvement. This will complement the State Government efforts to transform Ondo state into Africa's model Mega city that is clean, secure, livable, functions efficiently and enables people to express their potentials (Olokesusi, 2011) [4].

The existing markets in selected littoral corridor of Ondo state is associated with problems which includes double parking along access roads leading to the market centres, encroachment into streets by traders, difficulties in offloading agricultural produce from the neighboring coastal communities as a result of large movement of people accessing the few available jetties that serve as points of contact with the market environment. The major challenges faced by farmers include low out price, unreliable market, inadequate transport and accessibility to market locations. [5] The empirical investigation of the extent to which ineffective and inefficient management contribute to the prevailing environment in these markets is the main focus of this study. The goal of this paper is to examine the intermodal access to the market's location in the study area.

II. RELATED WORK

The term 'market' and the alike term 'Oja' in Yoruba language has many connotations. Authors from various disciplines have attached different meaning to the word, 'market'. Market is defined as an "authorized public concourse of sellers and buyers of commodities meeting at a place, more or less strictly limited or defined at an appointed time" [6]. Omole (2002) opined that markets are man-made features established for the use of man [7]. The work of scholars like Filani and Richard (1996) [8], Nwafor (1982) [9], [10] Sada and McNuity (1978), [11] Eben-Saleh (1999), among others agreed with this assertion. Nwafor (1982) held the view that a crawly market requires the existence of many full-time traders and that it is a more convenient type of market in that it provides daily needs to the people on daily basis [9].

Antonis Mavropoulos (2011) was of the view that new challenges are emerging and the current situation must be seen in a different way. Our waste management systems and our market conditions, even at their best, are incapable of handling the growing amounts of waste. In the same vein, he stated that unless a new paradigm of global cooperation and governance is adopted, a tsunami of uncontrolled dumpsites will be the prevailing waste management method [12].

Barnabas (2017) stressed that the importance of transportation system cannot overemphasized especially with regards to agricultural products. [13]. His research revealed that Nigeria food security is critically dependent on effective transportation system and the finding revealed that transportation plays important role in the distribution of agricultural products. Ajetunmobi (2010) looked at the role market plays in the socio-economic development of the society by saying that it brings about inter-group relations among relations different [14]. Since man's wants are insatiable and unlimited, there is the need to exchange several goods from different regions. He further said that inequality in skills and resources partly led to the creation of market in man's environment. For instance, Lagos Island has the largest number of traditional markets, some of which still form the leading markets in the area, such as Ebute-Elefun, Oke-Arin, Ebute-Ero, Jankaara, Ojuwoye, Ita-Faji, sand grouse and Oju-Olobun markets. Fakere and Fadmiro (2012) argued that existence of markets in any town or city is expedient due to the facts that commercial activities are the back-bone of several economies [15]. Omole (2002) observed that Market centres in Osun state are found to be of different orders in terms of goods and services they provide, the period and mode of their operations, the land area they occupy and their level of patronage among others [7]. He explained further that very important is their classification in term of their periodicity and mode of their operations and patronage. Considering the period, mode of operation and patronage of market in Osun state, two major types of market can be identified. These are periodic markets and daily market.

A. Location Theories

Pioneers in land economics viewed distance as a "social friction" that needed to be overcome. Friction is a metaphor for transportation and communication costs. Isard (1956:24) opined that both time and space must be vital considerations in any theory of the economy [20]. He stressed that: "If there is any sense at all to location economics, it is because there are certain regularities in the variation of costs and prices over space. These regularities arise primarily because transport cost is some function of distance. Since it is the distance factor that is the heart of locational analysis, there is every reason to speak of transport inputs wherein distance and weight are the two basic factors, and of transport rates as prices of these inputs." As a general rule, the more accessible a location is to the positive elements in the environment, the more valuable it will be. However, different types of land use call for access to different things. Businesses seek access to a productive labour force and other businesses commercial establishments may seek access to markets and households also desire access to amenities. Consequently, land planners and developers recognize that the more accessible a location, the greater its profit potential. Hence, time and convenience are important elements of access. Modern transportation networks have made access as much a function of urban infrastructure as of simple physical distance.

B. Bid-Rent Relationship

A location model proposed by von Thunen (1826) stresses the distance-cost relationship allotted to land values. Although the Von Thunen model has been criticized because it assumed unlikely conditions such as production taking place around an isolated market and soil being of constant fertility. Nevertheless, it established a distance-cost relationship. According to Von Thunen (Balchin Bull & Kieve, 1995:16) land in close proximity to the market (CBD) would be in great demand because of low transport

cost [16]. The highest rent would be gained for this advantage. In the outer belt there would be little demand for land because of high transport cost, rents would be low and the corresponding value of extensive production would be low.

The Alonso model assumes that the urban area has a single nucleus and that the market for land is perfect. However, it does not assign specific land uses to each rent gradient [16]. Although the model specifically refers to commercial and industrial land uses, the bid-rent relationship can be applied in general. If land is located further away from the CBD, the price tends to decrease (in a single nucleus city). The principle thus also applies to residential location, viewing travelling time and cost to work as the operating cost of a household. Alonso's theory is clearly a much-idealized view of reality, but it has some merit in that it attempts to demonstrate the nature of the land market and emphasizes the notion of efficiency in the use of urban land. It should be noted that the theories of Von Thunen and Alonso are general theories that may be applied to any land use. A number of location theories specifically formulated to explain residential location will follow now.

III. STUDY AREA

Igbokoda is located in Ilaje local government area of Ondo state, it is the administrative headquarters of the local government, the town is approximately on geographical co-ordinate of 6^0 21^I 0^I North, 4^0 48^I 0^{II} East, the town is bounded in the north by Kurugbene settlement, to the west by river Ofara, to the south by river Igbokoda and to the East by Igbokoda canal. The study covered selected markets that are held every nine days; and located along the river jetties. First, a market is located between Mihan Street and Morighanfen square parallel to the dredged canal on river igbokoda. Besides, Agadagba-Obon is one of the towns that make up Arogbo-ijaw, the Niger delta area of Ondo state it is located on geographical co-ordinate of 6^0 16^I 0^I North, 5^0 0^I 0^{II} East, it's about 45minutes drive from Ore, the area has hitherto gained prominence during the Niger delta agitation as a center of activism but all that now appear subsumed in the spirit of commercial and entrepreneurship activities blowing across the community.

Figure 1: Map of Nigeria Showing Ondo State
Source: Ondo state Ministry of lands and housing, 2019

Figure 2: Map of Ondo State showing Ilaje and Ese-odo Local government
Source: Ondo state Ministry of lands and Housing 2019.

IV. METHODOLOGY

A survey design method was used to achieve primary sourcing of data. The inferential and statistical methods were used in data analysis. Meanwhile, secondary and primary data were used to enhance healthier quantitative and qualitative results. For primary data collection, structured and unstructured questionnaires were given to the commercial drivers (NURTW members), Association of commercial Local boat operators, and the market users. Personal interview and on spot assessment of the markets were also conducted. Photographs of markets facilities in the area under review were also taken to give a meaningful visual impression to the study. Secondary Data was gotten from relevant books, newspapers, paper presentations, articles, publications, academic theses and internet search on the subject matter and documental evidences from the relevant agencies.

A. Sample Size and Sampling Technique.

The study focused on the traders, (associations of market men and women) and commercial drivers plying the market (NURTW) routes. Member and local commercial boat operators who are major set of people patronising the selected markets in the study areas. In this study, the total number of market traders' associations that are present in the markets and existing spaces for parking by road users and boat users in the market is of paramount interest. The sample frame consists of all the 2 selected markets in two different local government, all registered shop owners (traders), buyers and residents living in the corridor of market centres as well as commercial operators Road user and water ways navigators (NURTW Members and local commercial boat operators). The sample size for the study was 30% of the research population derived from table below. This agrees with Toluch (2001) who recommended a sample range of 10% – 30% of a population under investigation [20].

Table 1: Percentage drawn from Registered Association of Traders in Igbokoda and Agadagba-Obon Market

s/n	Association	Igbokoda Market		Agadagba-Obom	
		Numbers of traders	Sample taken 30%	Numbers of traders	Sample taken30%
1	Local gin sellers	16	5	26	8
2	Red oil sellers	28	8	18	5
3	Local mat sellers	16	5	10	3
4	Tomatoes/pepper sellers	42	13	30	9
5	Red meat sellers	12	4	11	3
6	Plastics sellers	14	4	16	5
7	Raw foods stuff seller	30	9	26	8
8	Fish sellers	66	20	67	20
9	Grinders	-	-	11	3
	TOTAL	224	68	215	64

Source; field work (2019) by author

Table 2: Sample Size of Registered Numbers of Vehicles (Drivers and Boat Operators) Respondents in Study Areas.

s/n	**Association**	**Igbokoda market**		**Agadagba-obon**	
		Numbers of traders	**Sample taken30%**	**Numbers of traders**	**Sample taken30%**
1	Registered numbers of vehicles/drivers	42	13	31	9
2	Registered numbers of commercial boat operators	63	19	52	16
	Total	105	33	83	25

Source; field work (2019) by author

A Total number of 189 questionnaires were administered to traders, commercial drivers and commercial boat operators while additional 100 Questionnaires (50 for each study area) was administered on random basis for shoppers patronizing the market. A set of questionnaires was designed to collect primary data. The questionnaire was administered to elicit information on the causes of the prevailing environmental conditions and problem faced by the market's users. The numbers of registered Associations in the market were a reliable sampling unit for this research.

B. Methods of Data Analysis

Two broad data analysis techniques that were employed involved Univariate analysis in form of tables, maps, figures, photographs and charts. It is a single factor analysis which describes the necessary features of the data sets. The second technique is the bivariate analysis which was used to determine the relationship between two variables. In this case, the Pearson correlation and chi squared tests was used to provide the basis for testing hypotheses. The Pearson correlation test method was used in measuring the nature and degree of relationship existing between two variables. The coefficient (r) ranges between minus one (-1) to plus one (+1) [17]. The higher the value of the coefficient on the positive side, the higher the direct or positive relationship existing between the variables while increasing coefficient towards minus one (-1) indicates increasing inverse relationship between the correlated variables. A coefficient around zero (0) indicates little or no relationship. However, the most widely used measure of linear correlation between two variables is the Pearson Product Moment Correlation Coefficient. It is used in a situation where the variables are available in ratio or interval forms.

The formula for the Pearson Product Moment Correlation is defined by Okoko (2001) as:

$$\frac{N\sum XY-\sum XY}{\sqrt{N\sum x^2-(\sum x^2)}\sqrt{N\sum Y^2-(\sum Y)^2}} \quad \ldots\ldots\ldots\ldots\ldots\ldots 1$$

Where $r_=$ Standard Score or r-Scores of xy

X= Raw Score for X

Y= Raw Score for Y

N= No of Items

In this study, it was used to establish the relationship between the shoppers' origin and Market locations.

V. RESULTS AND DISCUSSION

A. Demographic and Socio-Economic Characteristic of Traders patronizing the markets

1. Sex of Respondents

The general overview of sexes of respondents showed that the number of females interviewed outnumbered their male counterpart in trading activities in the study Areas. In Igbokoda market, the female traders accounted for 94.1% while males accounted for 5.9%, likewise in Agadagba-Obon the females account for 85.9% while males accounted for 14.1% respectively. The statistical evidence, is on tandem with the assertion of Greed (2004) that if one walk around a shopping centre and does a mental count, women are likely to outnumber men with the ration (65% - 35%) in shopping area [18]. The statistical evidence also confirms the assertion by [7] that market centres are women dominants see table 3

Table 3: Sex of Respondents

Sex	Igbokoda Market		AgbadagbaObon	
	Frequency	Percent	Frequency	Percent
Male	4	5.9	9	14.1
Female	64	94.1	55	85.9
Total	68	100	64	100

Source: Author's Field Work 2019

2. Location of Respondents' Residence

Investigation into the residence location of traders patronizing the markets in the area under review, as shown in Table 5 revealed that 13.2% of the sampled respondents in Igbokoda market lives around the market, while 86.8% residence of respondents are within the local government area. In Agadagba-Obom, the study shows that 9.4 percent resides around the market and 90.6 % are traders coming from far distant but within the local government area.

Table 4: Location of Respondents' Residence

Place of Residence	Igbokoda Market		Agbadagba-Obon	
	Frequency	Percent	Frequency	Percent
Around the Market	9	13.2	6	9.4
Within the local government	59	86.8	58	90.6
Total	68	100	64	100

Source: Author's Field Work 2019

3. Mode of Conveyance of Goods to Market by Traders

Study revealed that 37.5% of traders conveyed their goods to the market through private canoe while 54.7% of traders in Agadagba-Obom conveyed their good to the market through commercial boat. 7.8% transport their commodity by foot. Investigation through this research also reveal that 27.9% of the traders conveyed their goods through private canoes, while 67.6% conveyed goods to the market through commercial boats and 4.4 percent conveyed goods to the market by foot in Igbokoda market. see Table 5.

Table 5: Mode of Conveyance of Goods to Market by Traders

Mode of Transportation	Igbokoda Market		Agadagba-Obom	
	Frequency	Percent	Frequency	Percent
Private Canoe	19	27.9	24	37.5
Commercial Boat	46	67.6	35	34.7
Foot	3	4.4	5	7.8
Total	68	100	64	100

Source: Author Field Work 2019.

4. Distance in Kilometers from origin of Travel to Market Centre by Traders

As shown in the table 6, 27.9% of the respondents disclosed that the distance covered while transporting their commodity to the market location at Igbokoda is within 0-20km.; 51.5 claimed that they travel over a distance of between 21-24km before getting to the market location, and 20.6% of the Respondents fall within the distance bracket of 41-60km. Furthermore, for Agadagba-Obom, 56.3% of the Respondents cover a distance bracket of (0-20km), while 26.6% of traders sampled fall within distance bracket of 21-40km, and 17.2% of sampled trader travels in a distance bracket of (41-60km) to the study area.

Table 6: Distance in Kilometers to Market.

Distance	Igbokoda Market		Agadagba-Obom	
	Frequency	Percent	Frequency	Percent
0-20km	19	27.9	36	56.3
21-40km	35	51,5	17	26.6
41-60km	14	20.6	11	17.2
Total	68	100	64	100

Source: Author Field Work 2019

5. Problems Faced During Market Days

This question gives insight to probable deterrents to users of the markets. Table 7 shows that 72.1% of the Respondent in Igbokoda market admitted that difficulties in accessing the market were their major concern. Furthermore, the analyses revealed that 23.5% of the Respondent perceived pedestrian/traffic conflict as problem faced by them while 4.4% admitted that poor sanitation was their major concern.

Similarly, in Agadagba-Obon, out of 64 respondents surveyed, those that faced difficulties in accessing the market are 54.7% (35); pedestrian /traffic conflicts amounted to 32-8% (21) while 12.5% of the Respondent is of the view that poor sanitation is their Major concern. see Table 7.

Table 7: Problems faced by Traders

	Igbokoda Market		Agadagba-Obom	
Problems	Frequency	Percent	Frequency	Percent
Pedestrian/Traffic Conflict	16	23.5	21	32.8
Poor Sanitation	3	4.41	8	12.5
Difficulties in Accessing Market	4.9	72.1	35	54.7
Total	68	100	64	100

Source: Author Field Work 2019

B. Perception study on Public Transporter Patronizing the Market

1. Origin of Travel of Public Transporter Patronizing the Market

Table 8: Origin of Travel

	Agadagba-Obom		Igbokoda Market	
Origin	Frequency	Percent	Frequency	Percent
Benin	1	11.1	1	7.7
Owo	1	11.1	1	7.7
Akure	1	11.1	2	15.4
Ondo	1	11.1	2	15.4
Ore	2	22.2	2	15.4
Okitipupa	1	11.1	3	23.1
Irele	2	22.2	2	15.4
Source	9	100	13	100

Source: Author Field Work 2019.

The study identified that Respondents travel from far origin to access market in the study area. This assumption is validated by Analysis shown in Table 8 above, respondents indicated that 7.7% of Road user came from Benin Town in Edo State to Igbokoda market, while 11.1% of commercial road users ply their way to Agadagba-Obom from Benin City. Other origins of these market users (traders) include Owo, Akure, Ondo, Ore, Okitipupa and Irele. The market patronage is composed of buyers and sellers from different people of diverse languages.

2. Problems observed during Market days by Commercial Transporters

Investigation into problems faced by commercial vehicle operators in the study areas was unrevealed. This question gives insight to probable most pressing problem facing users of the market.

Table 9: Showing Problems Observed during Market days by commercial Transporters

Observed Problems	Igbokoda Market		Agadagba-Obon	
	Frequency	Percent	Frequency	Percent
Pedestrian/Traffic Conflict	4	30.8	1	11.1
Difficulties in parking	9	69.2	8	88.9
Total	13	100	9	100

Source: Author Field Work 2019

Table 9 indicates that 69.2 out of the sampled Respondent admitted that difficulties in parking were their major concern at Igbokoda market, while Pedestrian/Traffic Conflict accounted 30.8 percent. Similarly, the Table also explained the situation at Agadagba-Obom in which 88.9 percent of the sampled Respondent is of the view that Difficulties in parking was their major concern, while 11.1% believed that Traffic conflict was their major problem.

3. ***Suggestion for Improvement in Problems Identified***

Table 10 shows the likely suggestion gave by sampled commercial vehicle operators, analysis emanating from table 10 indicated that 84.6 percent is of the view that provision of park space will bring improvement to problems faced in the market, while 15.4% believed market redevelopment will solve majority of the problem observed in the market.

Likewise, at Agadagba-Obom, 66.7% believed that provision of parking space will go a long way in solving problem faced by them while 33.3% opted for market relocation as possible means of improving problems observed in the market. Table 10 shows possible suggestion for improvement of market problems.

Table 10: Suggestion for Improvement in Problems Identified

Proposed Solution	Igbokoda Market		Agadagba-Obom	
	Frequency	Percent	Frequency	Percent
Market redevelopment	2	15.4	3	33.3
Provision of parking space	11	84.6	6	66.7
Total	13	100	9	100

Source: Author Field Work 2019

Figure 3: Commercial both Operators Finding it difficult to Access the only available Jetty at Igbokoda Market; Sources*:* Author Field Work, 2019

Figure 4: Showing Part of Access Road Been Used as off-Loading Space for Local Gin at Agadagba-obom; Sources*: Author Field Work, 2019*

4. ***Transportation Network Analysis for Boat Operators Patronizing the Study Area***.

The fabric of all societies is held together by various kinds of networks; such as energy supply, communication, water supply, sewage disposal and, perhaps most importantly, transportation. Transportation Network Analysis is therefore, primarily concerned with the spatial, but also the temporal, nature of the movement of people and freight across land, where the movement is channeled onto roads or railways. The overland (road and rail) infrastructure constitutes the transportation network while the movement of people and freight constitute the flows (traffic) on the network [18].

1. Distance in Kilometer from Origin of Travel to Market Centres by Commercial Boat Operators

The rationale of this question is that it helps the researcher identify the distance covered in to the study area, it is depicted in the table below.

Table 11: Distance in Kilometer from Origin of Travel to Market Centres

Distance in Km	Igbokoda Market		Agadagba-Obon	
	Frequency	Percent	Frequency	Percent
0 - 20km	Nil	Nil	9	56.3
21 - 40km	4	21.1	5	31.3
41 - 60km	11	57.9	2	12.5
61k and above	4	21.1	Nil	Nil
Total	19	100	16	100

Sources: Author Field Work 2019

As shown in table 11, out of 19 Respondents sampled at Igbokoda market, 0% of the Respondents travel to the market centre in a distance ranging from 0 to 20km while 21.1% of the sample respondent admitted that the distance of travel to market centre at Igbokoda market ranges from 21 – 40km. About 57.9% of the sampled public transporter also claimed that they travelled in a distance ranging from 41-60km to Igbokoda market. Summarily, Table 11 also explains different distance traveled by commercial boat operators patronizing Agadagba-Obon from different areas of the local Government.

*5. **Problems Observed during Market Days by Commercial Boat Operators***

Investigation into problems faced by commercial boat operators in the study areas was unrevealed. This question gives an insight to probable most pressing problem facing users of the market.

Table 12: Showing Problems observed during Market Days by Commercial Boat Operators

Observed Problems	Igbokoda Market		Agadagba-Obom	
	Frequency	Percent	Frequency	Percent
Difficulties in parking	18	94.7	14	87.5
Difficulties in Accessing the market	1	5.3	2	12.5
Total	19	100	16	100

Source: Author Field Work 2019

The above Table 12, show that 94.7% out of the sampled Respondent admitted that difficulties in parking was their major concern at Igbokoda market, while Difficulties in accessing the market accounted 5.3%. see figure 3.

Similarly, the Table 12 also explained the situation at Agadagba-Obon in which 87.5 percent of the sampled Respondent is of the view that Difficulties in parking was their major concern, while 12.5% believed that Difficulties in accessing the market was their major concern. Also, see figure 4.

2. Suggestion for Improvement in Problems Identified Commercial Boat Operators.

Table 13, shows the likely suggestions given by sampled commercial boat operators, analysis emanating from table 13 indicated that 78.9 percent of the respondent at Igbokoda market is of the view that construction of more jetties will bring improvement to problems faced in the market, while 21.1% believed market redevelopment will solve majority of the problem observed in the market. Likewise, at Agadagba-Obom, 81.2% believed that construction of more jetties will go a long way in solving problem faced by them while 18.8 % opted for market redevelopment as possible means of improving problems observed in the market. see Table 13.

Table 13: Suggestion for Improvement to problems identified by Commercial Boat Operators.

Proposed Renewal Policy	Igbokoda Market		Agadagba-Obom	
	Frequency	Percent	Frequency	Percent
Market redevelopment	4	21.1	3	18.8
Construction of more jetties	15	78.9	13	81.2
Total	19	100	16	100

Source: Author Field Work 2019

C. Spatial Interaction Model

Transportation Planners are usually faced with the problem of making reliable forecast of traffic demand that reflects the effects of changes in population and socio-economic condition of people, if reliable forecast of future traffic is not made, then there is a risk of providing facilities that will either be under-utilized or over utilised [17].

Table 14: Classification table For Shoppers and the Attraction Factor

Origin of shoppers		Destination (Market Attraction)	
Around the market	6	Igbokoda	68
within LGA	56	Agadagba-Obon	64
within Ondo State	35		
Outside Ondo State	3		

Source: Author Analysis, 2019

Table 14 shows the origin of the shoppers alongside the attraction factors which are made available by sampled sellers. This result is obtained by summing the number of shoppers that patronize the two selected markets under the study based on their place of residence (Origin) and also, the Destination is the sum of numbers of attraction factors (Sellers) sampled from the two markets.

D. Gravity Model

Computing gravitational attraction between planets

$$G_{ij} = g * m_i * m_j * \frac{1}{d_{ij}^2} \quad \text{.....2}$$

Gij is gravitational force between i and j
g is gravitational constant
mi, mj is mass of planet i and j
dij is the distance between i and j
Tij is number of trips from zone i to j
is the measure of average trip intensity
Oi, Dj is production potential of zone i and attraction potential of zone j
f(cij) is accessibility of j from i

Formula

$$T_{ij} = p * O_i * D_j * f(C_{ij}) \quad \text{.....3}$$

Tij is number of trips from area i to j
$p$is the measure of average trip intensity
Oi, Dj is production potential of zone i
and attraction potential of zone j
f(cij) is accessibility of j from i

Assumptions

It is expected that the number of trips between an origin and destination is promotional to:
Production factor at the origin or Attraction factor at the destination or factor depends on the cost
By introducing balancing factors, the formula become (Ai and Bj):

$$T_{ij} = A_i\ O_i\ B_j\ D_j\ f(C_{ij}) \quad \text{.....4}$$

If we apply: $\sum_i T_{ij} = \sum_i A_i\ O_i\ B_j\ D_j\ f(C_{ij})$

And $\sum_i T_{ij} = D_j$

Balancing factor:

Hence,

$$D_j = B_j\ D_j \sum_i A_i\ O_i\ f(C_{ij})\ B_j = \frac{1}{\sum_i A_i\ O_i\ f(C_{ij})} \quad \text{.....5}$$

B_j depends on A_i thus: $A_i = \frac{1}{\sum_i B_j\ D_j\ f(C_{ij})}$

Process:

1. Set = 1, find using = $\frac{1}{\sum_j B_j D_j f(c}$ 6
2. Find using = $\frac{1}{\sum_i A_i O_i f(c}$ 7

3. Compute the error as
   E = $\sum(O_i - O+ \quad \sum(D_j - D$……..…8

O_i = actual productions from zone i

O_i^1 = calculated productions from zone i

D_j = actual attraction from zone j

D_j^1 = calculated attraction from zone j

4. Again set = 1 and find, also find
5. Repeat the steps until convergence. [19]

Table 15: Application of Gravity Model

		Destination (Attraction)				
	Tij	1	2	Ai	O9i	Oi
Origin	1	2.869436	1.315109	5.2239	4.184545	6
	2	26.7814	12.27435	5.2239	39.05575	56
	3	35.32538	46.44347	161.2503	81.76885	35
	4	3.02378	3.96707	222.856	6.99085	3
	Bj	0.833881	1.268493			
	Dj	68	64			

Source: Author's Analysis, 2019

The Table 15 shows the result obtained by applying the gravity model to estimate the trips the shoppers made to the two markets under study based on the survey carried out. The result also shows the estimate of the attraction factors (indicated by the sellers) and the shopper's origin. The trip made by the shoppers is then presented in Table 15 after which the procedure was performed 9 times to obtain a stable result. The result shows that the shoppers around the market, within LGA, within Ondo state and outside Ondo state made trips (on the average) of 2.87,26.78,35.33 and 3.02 to Igbokoda market respectively and trips (on the average) of 1.32, 12.27,46.44 and 3.97 to Agadagba-Obon respectively.

The estimated number of shoppers in each origin is given in column O9i and also the estimated available attraction factors (the sellers) which does not change over the iteration is given in row Dj. The sum of the absolute error was computed to be 69.51941 which give an average absolute error of 11.58657. see Table 15.

Oi=Origin/Production (i.e., around the market, within LGA, within Ondo State and outside Ondo State)
Dj=Destination/Attraction (i.e., Igbokoda Market and Agadagba-Obon)

E. Hypothesis Testing

In line with the Aim and Objectives of this study, two hypotheses tested are:

1. Ho: The shopper's origin is independent to the market location
2. Ho: There is no significant relationship between the shopper's origin and market location

Table 16: The Chi Square Analysis for Observe Count

	Observed	Igbokoda Market	Agadagba-Obon	Total
Origin	Around the market	2	4	6
	Within the Local Government	28	28	56
	Outside the Local Government	18	17	35
	Outside Ondo State	2	1	3
Total		50	50	100

Source: Author's Analysis, 2019

Table 17: Chi Square Analysis for Expected Count

	Expected	Igbokoda Market	Agadagba-Obon	Total
Origin	Around the market	3	3	6
	Within the Local Government	28	28	56
	Outside the Local Government	17.5	17.5	35
	Outside Ondo State	1.5	1.5	3
Total		50	50	100

Source: Author's Analysis, 2019

Hypothesis 1: (Chi square test of independence)
Ho: The shopper's origin is independent to the market locations
H1: The shopper's origin is dependent to the market locations

Decision rule:
Reject *Ho* if the p-value is less or equal to the alpha 0.05

Table 18: The Test of Independence Table

Pearson Chi Square	Value	Df	p-value
Chi-Square	1.029[a]	3	0.794
Likelihood ratio	1.048	3	0.790

The Chi-Square value for test of independence is 1.029 with degree of freedom 3 and the computed p-value is 0.794 which is greater than threshold 0.05, hence Ho cannot be rejected and this implies that the shopper's origin is independent of the market. The result obtained for chi-square test is consistent with the likelihood Ratio test which is the alternative to the chi square test of independence.

Hypothesis 2: Test of Correlation between the shopper's origin and the market
Ho: There is no significant relationship between the shopper's origin and market locations
H1: There is a significant relationship between shopper's origin and the market locations

Decision rule
Reject *Ho* if and only if the p-value is less or equal to the alpha 0.05

Table 19: The Correlation Test Table

	Value	Df	p-value
Pearson's Correlation	-0.078	3	.439[c]
Spearman Correlation	-0.067	3	.505[c]

As shown in Table 19, the correlation between the shopper's origin and the market is negative with p-value greater than threshold 0.05 for both the Pearson's

correlation and the Spearman correlation coefficient suggesting that we cannot reject the Ho indicating no significant relationship between the shopper's origin and the market locations

The study observed that population increase and unplanned rapid urbanization in the study areas has occasioned inequalities in economic and infrastructural provision; the markets users are without formal arrangement for infrastructural services like parking facilities that makes the market comfortable to patronize trade, hence the available infrastructure like jetties become insufficient and inefficient.

The study noticed that increase mobility and economic quest have necessitated a large population in the study area; this has led to unregulated and indiscriminate parking along access road leading to the market centres. The above observations are validated by the research finding that there is no provision of parking space in the selected study areas. This study also reveals that the level of patronage of the selected markets has to do the degree of attraction the study areas exhibit as shoppers travel from other states covering lengthy distance to access the market.

There is no strategic policy on provision and installment of parking facilities. Among the two tiers of Government (Local and State) thereby making these valued infrastructures discretionary rather than mandatory. The statutory government agencies have been sandwiched by daunting economic demands, politics, and corruption hence leading to compromise in doing the needful.

VI. RECOMMENDATION AND CONCLUSION

The rate of influx of people into market centres has been so high that the pace of development, and infrastructural provision could not accommodate them. These centres experience significant unplanned rapid urbanization, the high level of urbanization in our cities has occasioned inequality and informality in economic and infrastructural provisions, there is need installment of proposed parking space development in the study area. The study has stressed the importance of the market centres as local business centres. The market centres link many villages and therefore integrate them into the national economic system through commodity exchange, information flow and innovation spread. There is no denying of the fact that this study has added knowledge and buttress the existing one in the literature of market; facts have also been made available for market planning and administration in the study area.

This recommends development of good transport network for the study area to make movement of people and commodities to and from market centres easy and at low cost. State and Local Government should collaborate with the local people to provide market facilities and services such as parking spaces, construction of more jetties and effective market administration. Perimeter fencing and open storage spaces should be provided to prevent on street display of goods; besides, adequate parking spaces should be provided around the market area in order to prevent on-street parking around the market. More shops and stalls should be provided to circumvent on-street trading and traffic congestion. The local government should recognize the traders and traditional rulers as foremost Stakeholders in any decision-making processes and activities; public participation should be encouraged in provision of public facilities.

REFERENCES

[1] O. Ayoade, "Community Self-help Development and the Growth of Small Towns, in Environmental Planning and Health in Nigeria", Essays in Honour of Professor Timothy Olayiwola Egunjobi, edited by Tunde Agbola Olatubora C. O. Bolanle Waheeb Lekan Sanni, Ipingbemi O. published by Department of Urban and Regional Planning, Faculty of Social Science, University of Ibadan *pp. **249-279***. **2008.**

[2] Igor Kabashkin, "Modelling of Regional Transit Multimodal Transport Accessibility with pettric net Simulation". **2015**.

[3] A. Asabia, "Making a clean change, women run facilities promote Health and Sanitation" www.metamorphosis-Nigeria.org (accessed on **6** December, **2011**). **2011.**

[4] F. Olokesusi, "Lagos the Challenges and Opportunities of an Emergent African Mega City" Paper presented at the NISER Seminar series on **5th** July, **2011**.

[5] Ajay S. Singh, Douglas Kibirige , Mhlabane M. Mthobisi, 'Contributions of Eswatini National Agricultural Union on Small Scale Maize Farmers in Eswatini (Swaziland)', International Journal of Scientific Research in Multidisciplinary Studies , Vol.6, Issue.9, pp.**93-100**, September, **2020**

[6] F.K. Omole, "Analysis of some Factors affecting Market Patronage in Osun State, Nigeria". *Asian Journal of Business Management Maxwell Scientific Organisation*, Vol **1**. No. **1**, pp. **24-31, 2009.**

[7] F. K. Omole, A Spatial Distribution of Market Centres on the Development of Osun State Nigeria PhD. Thesis F.U.T. Akure, Nigeria, **2002.**

[8] M. O. Filani and Richard P. R., Periodic Market System and Rural Development "The Ibarapa Case Study Nigeria Vol. **3**: pp.**149-162, 1996**.

[9] Nwafor J.C., "Marketing System and Periodic Market Nigeria" In Maps pp. **114, 1982**, ISBN 0340184256.

[10] P. O. Sada and M. C Nuilty, "The Market Trader in the City of Lagos, Urbanisation and Problems in Nigeria", Ibadan University Press ISBN 9781211016 pp**. 63-80, 1978**

[11] M. A. Eben-Salah, Alkalaf, "The Evolution of Urban Built Form of a Traditional Settlement in South-Western Saudi-Arabia" *The [nit.] Sa Appl*. Vol.**34**, No.**6**. pp.5**49-669, 1999.**

[12] A. Mavopoulos, Waste Management 2030, Waste Management World (www.goggle.com), 2011.

[13] G. Barnabas, "Effects of Transportation on the Marketing of Agricultural Products in Jos North, Nigeria", *Journal of Research in Business and Management* Vol.**5**, Issue **2** pp**.99-100, 2017.**

[14] R.O. Ajetunmobi, "Aspect of Economic Transformation in Lagos-Economic Activities in Lagos State", the Evolution and Development of Lagos State, article index **3, 2010**.

[15] A. A Fakere, and J.A. Fadamiro, "Decentralization of Markets and Environmental Sanitation scheme: *A focus on Urban Core of Akure, Nigeria". Journal of Environment and Earth Science* www.iiste.org ISSN 2224-3216 (Paper) ISSN 2225-0948 Vol. **2** No.**8**, **2012.**

[16] P. N, Balchin, G.H. Bull and J.L. Kieve, "Urban Land Economics and Public Policy" 5th Edition Macmillian Press Limited London. **1995**.

[17] E.E. Okoko, "Quantitative Technique in Urban Analysis", Kraft Limited Published 6A Polytechnic Road, Sango Ibadan, Oyo State, Nigeria. **2001**.
[18] C. Greed, "A Code of Practice for Public Toilet in Britain" *WTO SUMMIT*, Beijing. pp. **17-19** Nov. **2004**.
[19] A. Hadachi Transportation theory and Application, **2018**.
[20] A. C. Jordaan, B. E. Drost, M. A. Makgata, "Land Value as a Function of Distance from the CBD: The Case of Eastern Surburbs of Pretoria". SAJEM NS Vol.**7**, No.**3**, **2004**.

AUTHORS' PROFILE

Dr. I. Njoku is a Lecturer at the Department of Logistics and Transport Technology, Federal University of Technology, Akure Nigeria. He holds Bachelor of Technology, Master of Science and Doctor of Philosophy degrees in Maritime Transport Management from the Federal University of Technology, Owerri (FUTO) Nigeria in 2000, 2009 and 2015 respectively. He also pursed another Master's degree in Financial Management from FUTO in 2007. His area of specialization includes maritime transport and shipping finance. He has published widely in both national and international journals He is a member of CILT, Nigeria.

Mr. B. S. Olisa had PGD, M.Tech. in Transport Management Technology from Federal University of Technology, Akure, Nigeria, in 2012 and 2019. He is currently a PhD student in Department of Logistics and Transport Technology, FUTA, Nigeria. He is a member of CILT, Nigeria since 2008. He has published a number of research papers in reputed international and local journals.

Mr. Y. Okubakeko pursed a Bachelor Degree in Urban and Regional Planning and M.Tech. in Transport Management Technology from Federal University of Technology, Akure, Nigeria. He is currently a member of Nigeria Institute of Town Planners (NITP). He is also a Registered Town Planner in Ondo State Civil Service, Nigeria.

