Handbook of Research on Institution Development for Sustainable and Inclusive Economic Growth in Africa

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Chapter 17
Rural–Urban Food Movement: Role of Road Transportation in Food Chain Analysis

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ABSTRACT

The production of the food is majorly composite to the rural setting, and the consumption of this food is not only restricted to the rural area. This rural food production and urban area demand/consumption emphasises the need for rural-urban market linkages. This study employed mixed methods to investigate the role of road transport in the flow of food products from rural areas to the urban markets. Ten urban markets were sampled and 250 respondents from urban markets in Ibadan. The study revealed that household collaboration in the production and marketing of food produce exists in Ibadan. It was established that distance and transportation cost plays a vital role in supply volume, pricing, and delivery price. The variance in delivery cost is dependent on factors such as bargaining power, the season of the year, demand, destination, and road condition. In conclusion, improved roads condition and workable traffic policies that eliminate roadblocks are recommended.

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INTRODUCTION

The fact that nations, settlements cannot survive in isolation brings about interaction and relationship between them. The connection and interaction between settlements is a function of transportation. Transportation is a measure of relationship between places; it helps bring about interaction between human settlements. The nature of relationship between rural settlement and urban centers is dependent on the transport sector. Rural-urban interaction is most times a demand-supply relationship. Rural areas supply the food that the urban centres need for sustainability, while they need these urban centers for their threshold. The rural population most times does not have the population strength (range) to survive in business of food crop production thus it needs the urban centers to demand for food and thus supply (Osabuohien, 2020a; 2020b). What makes interaction easy and feasible is transportation.

Food chain analysis is a concept that helps in understanding the rural and urban market systems developmental impact within a geographical location. Critical to the food system is market linkage, food production and distribution across rural and urban setting in which road transport is imperative.

Transportation as a part of any human activity determines the goods and services available for consumption (Nkegbe et al., 2012). Spatial distribution of facilities, services and goods in space cannot be efficiently maximized if the transport sector is paralyzed. The transport sector is an important component of the economy impacting on development and the welfare of populations. When transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multipliers effects such as better accessibility to markets, employment and additional investments. When transport systems are deficient in terms of capacity or reliability, they can have an economic cost such as reduced or missed opportunities. Studies (Ajiboye and Afolayan, 2009; Tchanche, 2019) noted that road transport is the most common means of transportation and complex network. Its network covers a wide range, physically convenient, highly flexible and usually the most operationally suitable and readily available means of movement of goods and passenger traffic over short, medium and long distances.

Studies (Popoola et al., 2015; Avery et al., 2017) state that transport as a lung to other sector of the economy performs the role of linking supply and demand. Transport contributes to the overall development of a country since it serves as essential means of collecting, moving, transferring and distributing people as well as goods in from place to place. Thus, development is a function of demand for transport. In Northern Nigeria, Yunusa et al. (2002) reported that road improvement in part of rural Kaduna, led to significant increase in agricultural production, farm and non-farm employment and revitalization of economic activities in the area. Buttressing this, Ogunleye et al. (2018) reported that road transport infrastructure investments over the years in Nigeria had brought about an upward movement of agricultural sector in the country. This is because good road networks often ease transport costs and as said by Oni (2000), it tells a great deal about a society and its values. Thus, it can be said that transportation is the life-wire of any environment (Medayese, 2009; Herrero, 2011). Herrero (2011) iterate that transport is an important factor in the context of sustainable development due to the pressure it places on the environment, its, economic and social impacts, and its linkages with other sectors. It is the channel through which information is been diffused from one place to another, knowledge is been shared, and commercial activity takes place. Commercial activity in the instance of this study is focused on the food movement from rural areas to urban market within the food system and analysis.

Agricultural production is very important to the economy of developing nations and Nigeria in particular. Porter (2013) is of the notion that in productive agricultural regions, transport services are essential for the evacuation of produce. In Nigeria, Tunde, and Adeniyi, (2012) stated that, transport is regarded

as an important factor involved in agricultural development. This can be postulated that agriculture will depend on transport. Agricultural activities in developing countries are constrained by several factors one of which is poor rural infrastructure and inadequate and poor transport sector. Such is that a poor transport system would necessarily influence costs.

With the challenges of transportation increasing daily and thus varying from one location to another, it is obvious that lack of good transportation networks, poor condition of transport routes, poor planning and traffic congestion are the problems of transportation. These problems have direct effect on the flow of agricultural produce from rural areas to urban centres. The problems militate against the profitable movement of farm products to either rural markets or the urban markets and high selling cost in urban centres. Obinna and Ukoha (2017) narrated the negative effect of poor road condition on cassava farming. Among rural cassava farmers of Abia, Nigeria, it was reported that good road condition and availability of a faster mode (as against the common rickety rural transport system) was key to achieving profitable cassava production and sustainable farming. This is heightened by the fact that neither the farmer nor the rural traders are equipped with enough storage and processing facilities which will enable them access core areas.

The study brasses its argument that three aspects are crucial in effect food delivery system: physical infrastructure, including road networks and affordable transport; relations between producers, traders and consumers; and information on how markets operate, including price fluctuations and consumer preferences. Poor physical infrastructure can have far-reaching consequences on producers' prices, as inadequate roads usually entail prohibitive transport costs.

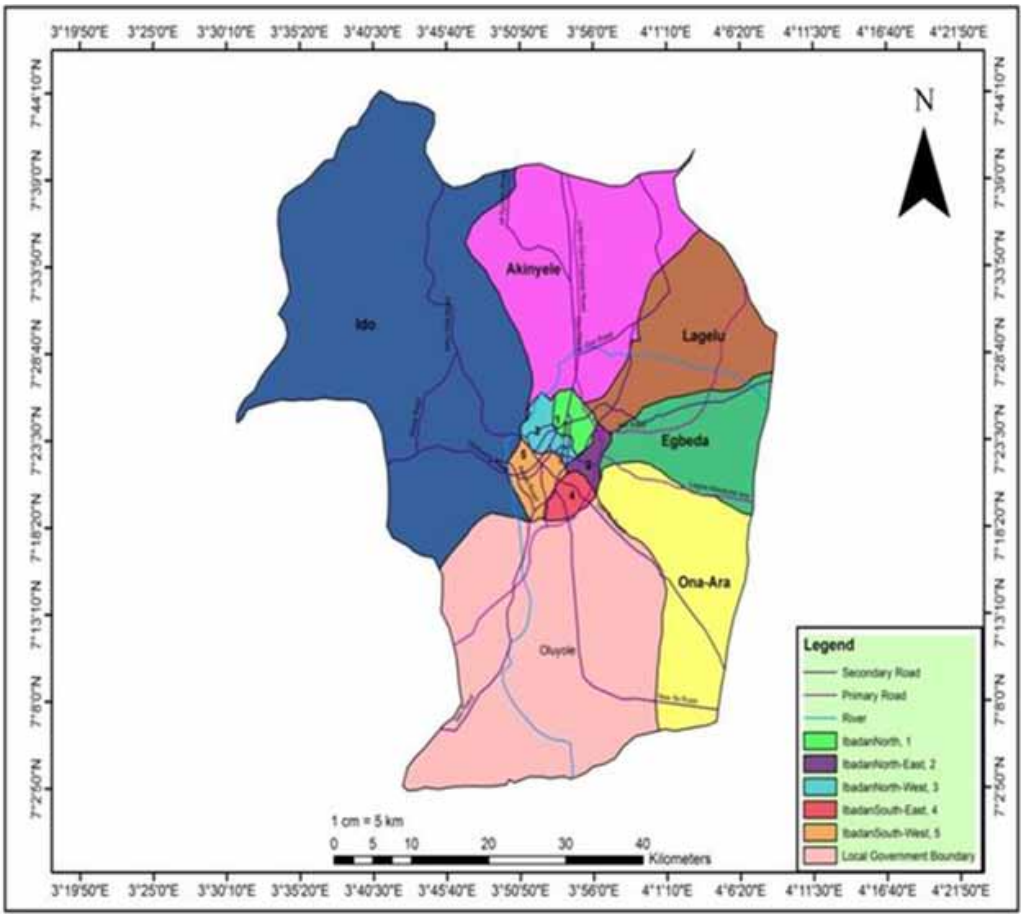
Badejo (2011) stated that "the transport in Nigeria is better explained as very pathetic and unfortunate, despite huge investment which the sector has enjoyed over the years especially since in independence in 1960". He argued that when measured by all known international standards, the transport situation in Nigeria can be described as severally challenged by many or a combination of different problems which ranges from: corruption, institutional framework problem, poor and lopsided information and data base, unfavourable government policies. The growth and development of other sector of the economy (agricultural production) inclusive is often dependent on an improved transport sector (Popoola et al., 2015). This true as transport helps to close up the demand-supply gap between rural farmlands and urban markets. Against this backdrop, it is considered inevitable to examine the effect of transportation on the flow of farm produce from rural areas to urban centres (markets).

The nature of the agricultural relationship between the rural and urban centres has been between the rural farmlands and urban markets. Urban centres depend heavily and almost entirely on farmers in the rural areas for their requirement of agricultural products (food). The efficiency of the flow of agricultural produce depends on the transport facilities available for use. But this does not mean the productivity level of agriculture is entirely dependent on transportation. Against this backdrop, it is considered inevitable to examine in this chapter the effect of transportation on the flow of farm produce from rural areas to urban centres (markets).*The question that guides this study is what is the role of road transport system on rural-urban food chain analysis*.

STUDY METHODS AND MATERIALS

The case study area-Ibadan is the capital city of Oyo state. The city grew organically as it did not experience any form of conscious physical planning. Ibadan is made-up of eleven (11) local government

Figure 1. Local governments areas of Ibadan

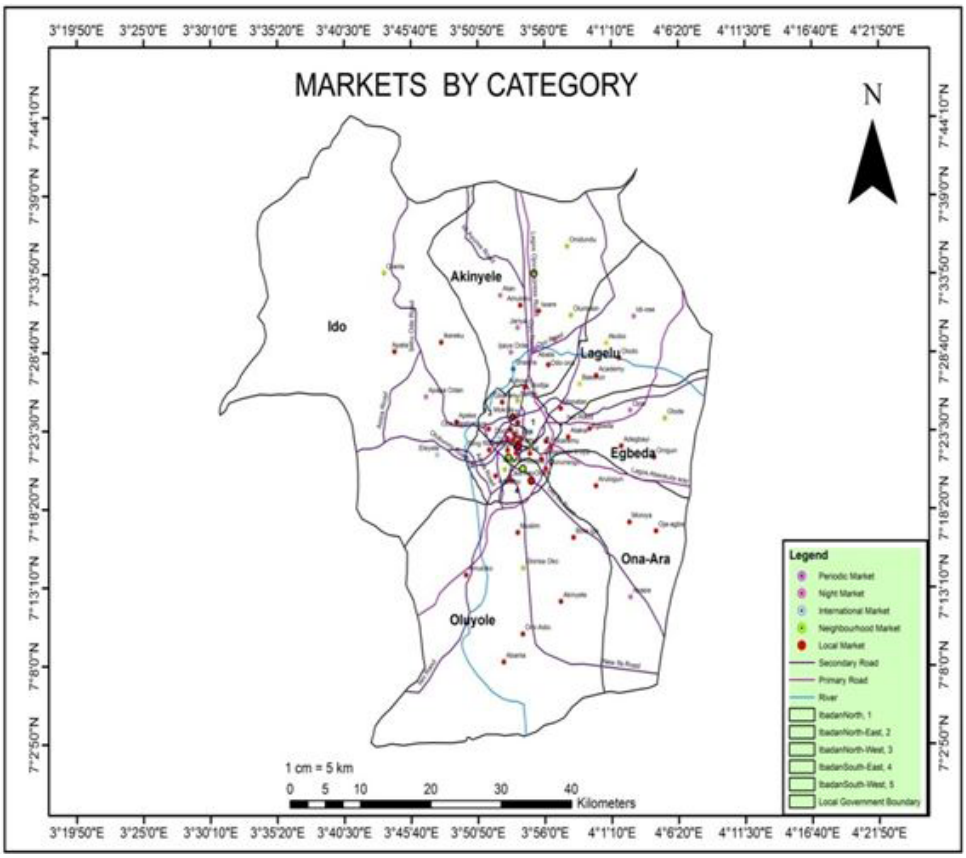


area (LGA), 5 urban metropolitan (Ibadan North West, Ibadan North, Ibadan North East; Ibadan South East; and Ibadan South West) and 6 rural region LGAs (Akinyele; Lagelu; Egbeda; Ona-Ara; Oluyole and Ido) (Figure 1).

Spatially, Ibadan is located near the forest-grassland boundary of south-western Nigeria, 128 km inland northeast of Lagos and 530 km southwest of Abuja, the Federal capital and is a prominent transit point between the coastal region of the south and the areas to the north in the extreme western portion of the country. Despite the metropolitan configuration and urban spatial change of Ibadan (Fabiyi, 2006), agricultural related activities and trading along both formal and informal routes remain two of the major employers of labour in the city (Wahab and Popoola, 2018a&b Wahab et al., 2019). This results in a whooping spatial distribution of markets in the State (Figure 2).

The study made use of survey research design to examine the effect of road transportation on the flow of farm produce from rural areas to urban markets in Ibadan, and the two main types of data that will be used in the study are obtained from both secondary (existing literature) and primary sources in the study. The primary data type to be used for the study is structured questionnaire. Also, to compliment the quantitative data source from questionnaire, the study engaged in an on-spot interview with rural-urban food transport drivers, food crop sellers in urban markets and some rural farmers within the study area.

Figure 2. Identified markets within Ibadan



Thematic and narrative analysis was done from the secondary data gathered and the interview responses done in a narrative form such that it was well situated within the thematic discussions. For this study, the main focus of analysis is urban marketers' experiences as relating to the flow of products from rural point of purchase to urban markets. The sample frame for the study comprises of all the urban markets in the five (5) urban local government area of Ibadan (Table 1).

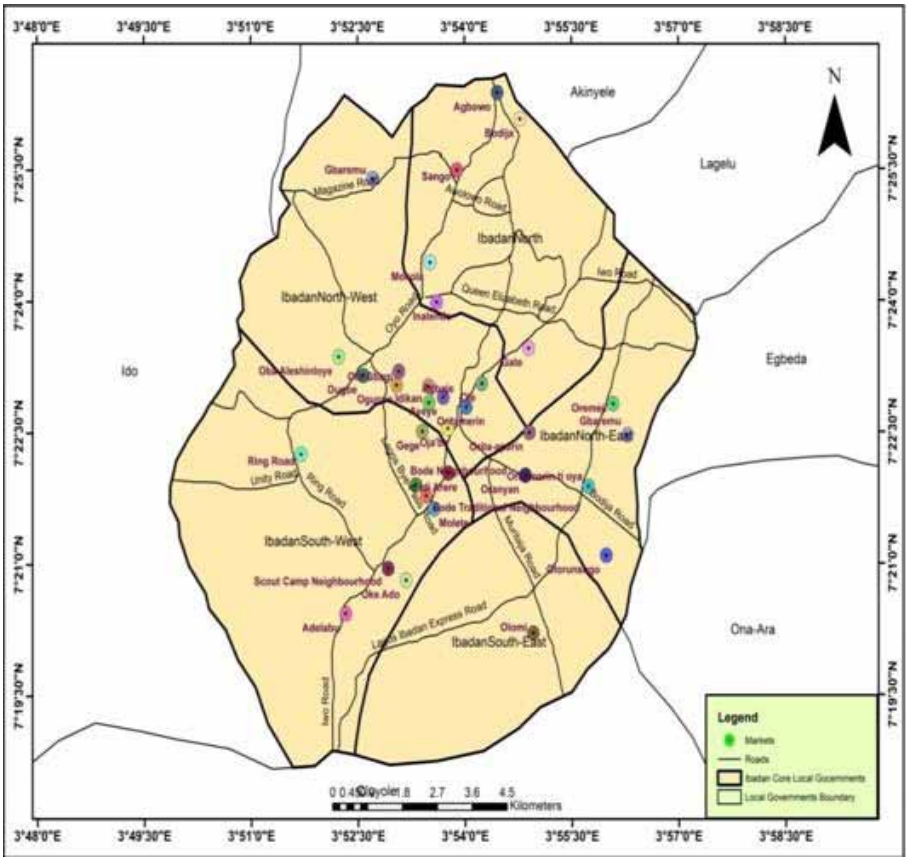
Table 1. Markets in Ibadan metropolis according to LGA

Local Government	Name of Markets in the LGA
Ibadan North	Bodija, Gate, Gbaremu, Sango, Mokola, Sabo, Agbowo, Inalende
Ibadan North East	Oje, Bashorun, Araromi, Agugu, Irefin
Ibadan North West	Dugbe, Agbeni, Alafara-olubadan, Ayeye, Beere, Agbaje, Ifeleye, Ogunpa, Oritamerin
Ibadan South East	Orita-merin, Molete livestock market, Ile-Tuntun, Owode, Oja-oba, Orita-aperin bode
Ibadan South- West	Aleshinloye, Challenge, Orita Challenge.

Source: Oyo State Agricultural Development Programme Office (2017)

For the study, a multi-stage sampling technique was adopted in selecting the study area and the sample size. The urban markets were identified using the data from Oyo State Agricultural Development Programme Office and other markets not mentioned identified in the list where identified purposively. Two (2) markets each was selected from each LGA through balloting making up a total of 10 urban markets. In addition to the balloting, the researcher took into consideration for case study the market's ease of access, popularity, and type (periodic or daily market). Respondents were also chosen purposively (considering the study is focused on food crop- vegetable, fruits pepper and tomatoes traders). For the study, all the markets in the five urban local government areas were identified. Ibadan North has 8 markets, Ibadan north East has 5 markets, Ibadan North West has 9 markets, Ibadan South East has 6 markets, and Ibadan South-West has 3 markets (Figure 3).

Figure 3. Identified markets within the five urban local governments



In Ibadan North Local government area Bodija and Sabo market was selected, Bashorun and Oje markets in Ibadan North-East LGA, Beere and Dugbe market in Ibadan North-West LGA, in Ibadan South-East Molete and Orita-aperin market were selected, and Ibadan South-West Challenge and Aleshinloye market were selected (Table 2).

Table 2. List of markets selected for the study according to LGA

Local Government	Name of Markets in the LGA
Ibadan North	Bodija, Sabo.
Ibadan North East	Oje, Bashorun.
Ibadan North West	Dugbe, Beere.
Ibadan South East	Orita-merin, ojaoba.
Ibadan South- West	Molete scout camp, Challenge.

Source: Authors' Field Survey

For proper representation, 25 questionnaires were administered in each of the 10 selected urban markets amounting to a total of 250 respondents. The 25 questionnaire per market was arrived at owing to the difficulty in establishing the total market population (that is food crop traders) in Ibadan markets. Preliminary field observation and informal discussion with the market union leaders reveals that many of the markets do not have stalls, food crop sellers are of transit characteristics, road sellers are many than stall owners and that traditionally it is wrong and cannot be established the total number of market traders of a particular crop. Coupled with this, the lack of database for the number of traders selling crops identified in the local government areas and because most of the markets have no well planned out layout that will give the actual number of stalls in the market. Also, two transporters of the farm products randomly (based on availability and willingness to partake of the study) picked in all the selected markets were interviewed.

CLASSIFICATION AND GEOGRAPHY OF MARKETS IN IBADAN

The complexity of the word "market" makes it very difficult to classify; the market can be classified based on any of the following factors or their combination;

- **Place:** The place factor classify market into three which includes local, national and international markets
- **Time:** This unlike the formal classify markets into a very short period, short period, long period and very long period.
- **Competition:** This, unlike the other two divides markets into a perfect competition and imperfect competition.

For a better understanding of market structure within Ibadan region, the study utilizes the factor of place to categorize markets in the region; thus, each market visited was discussed under local, national and international market. Local Markets also called traditional or indigenous markets are the most common type of market in the study area. This is as a result of the cultural setting of Ibadan. Most of the markets sprung up at the city centre, a warrior's courtyard or front yard, or due to the availability of modern facilities (Schools, transport routes). However, most markets in Ibadan falls within the circle of local markets. This doesn't mean all are predominantly traditional or unplanned. Some of these markets

are organized and planned, although become easily deteriorated and look unplanned over the years due to lack of maintenance and sub-standard building material used.

Unplanned local markets example of which is *Oja' Ba /OritaMerin* (see Figure 4) markets are found in the city centre, the markets are dated back to the 80s and they started by people selling farm produce. The market later extended with time and covered a large area in its domain. Oja'ba is patronized both by day and by night; the advent of arterials makes the pattern of the market to be on-street trading with development being of natural, gradual and sense of identity. This gradual development led to Orita-merin market. Another unplanned market *Agbaje/Ayeye markets* are seen as a further extension of the Oja'ba/ Oritamerin market. There is no clear boundary between the two markets, although they are being referred to by users {buyers and sellers} as two separate markets. The stalls are located along the roads. Agbaje is a daily market while Ayeye operates both day and night patronage.

The geography of another unplanned local market called *Inalende market* shows that it is more of a food items markets, it accommodates sellers who are not willing to move to the Mokola market. The market is a linear one as stalls are also positioned along the roads. Its serves as a neighbourhood market for the surrounding residents; *Agbowo market* is a domain of this market was planned for offices and shops; the growth of the University of Ibadan, however, increased the movement of various good sellers to the present day Agbowo market and also *Sango market* emerged as a result of the Old Oyo-Ibadan express road; the market booms because of the presence of its closeness to the Polytechnic of Ibadan. The market features foodstuffs, building materials, cloth and shoes, provisions and cosmetics and plank sellers. These present an argument that the location characteristics present the functioning of a market.

Figure 4. Example of unplanned local market (Oja'ba)
Source: Authors' Field Survey

Planned local markets in Ibadan are born from proper and effective planning decisions. That is, the government decided these market locations. In this study, the example of such a market is the *Mokola market*. The Mokola market came as a result of an attempt to resettle street traders around the Mokola-Roundabout area. The parcel of land was cleared without any stalls put in place by the government. Traders are thus responsible for their stalls. The market, although very small, has all sections ranging from food items to the jewellery section. Another planned market is the Oranyan market: The Oranyan market, unlike the Mokola market, although planned, came into being as a result of the resettlement scheme carried out to enhance renovation of Mapo hall. The Jankara market as being fondly called is much more composed than any other planned local markets. It comprises of livestock, gold, cloth, furniture and light industry sections; although very dirty.

The national market is a form of markets that provides services and goods not only for the area but attract buyers and sellers daily from other parts of the country. It doesn't necessarily mean that these markets must be planned but, they could be once an international market. Examples of national markets identified include Dugbe/ Agbeni Market, Bodija Market and Alesinloye Market. Like national markets that attract nationwide buyers and sellers, *International markets* are markets where both local, national and international goods and services are provided for the consumption of buyers. Activities in this market encompass basic, and non-basic activities and even exportation of locally produced commodities are made possible. Some of the markets visited that qualify as international markets include Bodija and Aleshinloye market.

RURAL-URBAN FLOW OF FARM PRODUCE: THE CONCEPTUAL THINKING

The study was based on the spatial interaction model traced to French geographers' notions of geographic de circulation, including both the movement of physical objects and the communication of intangible ideas. Its fullest development as the most fundamental of all geographic concepts came in the middle 1950s as the seminal contribution of Ed Ullman. Hitherto, geography had been conceptualized as a way of describing the areal differentiation of sites. With the spatial interaction concept, Ullman shifted attention to the situation as a second and equally important locational attribute. Areal differentiation emerged as the outcome of transportation and trade, which permitted specialization in economic activities and concentrations of various social groups. Thus, spatial interaction remains fundamental to understanding the development of distinctive regional geographies.

One methodology of importance to transport geography relates to how to estimate flows between locations, since these flows, known as spatial interactions, enable to evaluate the demand (existing or potential) for transport services. A spatial interaction is a realized movement of people, freight or information between an origin and a destination. It is a transport demand/supply relationship expressed over geographical space. Spatial interactions cover a wide variety of movements such as journeys to work, migrations, tourism, the usage of public facilities, the transmission of information or capital, the market areas of retailing activities, international trade and freight distribution. Economic activities are generating (supply) and attracting (demand) flows. The simple fact that a movement occurs between an origin and a destination underlines that the costs incurred by a spatial interaction are lower than the benefits derived from such an interaction. As such, a commuter is willing to drive one hour because this interaction is linked to an income, while international trade concepts, such as comparative advantages, underline the benefits of specialization and the ensuing generation of trade flows between distant locations.

Spatial interaction is a dynamic flow process from one location to another. It is a general concept that refers to the movement of human beings such as intra-urban commuters or intercontinental migrants but may also refer to traffic in goods such as raw materials or to flows of intangibles such as information. While the origins of the term may be traced French geographers of the early twentieth century, Edward Ullman's (1954) "Geography as Spatial Interaction" is normally cited as the seminal statement of the concept. In Ullman's conception, there were "*three bases for spatial interaction*" or more fundamentally, three reasons for why things move *complementarity, transferability, and intervening opportunity*.

Complementarity explains that there must be a supply and a demand between the interacting locations. Rural farmland (area) is complementary to an urban area (market) because the first is supplying the food while the second is supplying consumers and buyers. The same can be said concerning the complementarity between farmland and urban market buyers. Complementarity refers to the presence of a demand or deficit at one location and a supply or surplus at another without which there is no economic rationale for any movement. Agriculture which comprises of food products according to Hine and Ellis (2001) is best served by consistent high urban, and international, demand, and this is best brought about by an efficient, high volume, transport and marketing system where the transporting and marketing unit costs are low. The rural areas engage in primary activities which form the foundation for any economic development.

Generally, rural areas serve as the base for the production of food and fibre, the major sources of capital formation for a country, and a principal market for domestic manufactures (Olayiwola and Adeleye, 2005). Close to two thirds of the natural wealth in low-income countries is embodied in crop and pasture land (Omiti et al., 2009). Urban areas in Ibadan also depend on the rural areas for such natural wealth such as food for survival. There exists a symbiotic relationship between the rural and urban areas. The rural areas provide the urban centres with farm produce to feed on while the urban areas help in the diffusion of idea and value-added goods to the rural areas. Oluwasola et al. (2008) sermonized that such symbiotic relationship though beneficial to both sides, is expected to specially provide the necessary impetus for improving the economic prospects of the rural areas. Oluwasola et al. (2008) argued that rural-urban linkages represent a powerful strategy for enhancing incomes, increasing productivity, alleviating poverty and promoting employment in the rural areas. While urban centres focuses on the production of value-added commodities, rural areas are advantaged in providing certain goods and services, mainly agricultural products and labour for urban centres (Tacoli, 2003; Satherthwaite, et al., 2010; Mulyana, 2014; Turok and McGranahan, 2019). This process brings into fore the relevance of the transferability principle of the spatial interaction model.

Transferability speaks that freight (food transported), persons (buyer or seller) or information (seasonality of produce and rural farmers contact) being transferred must be supported by transport infrastructures, implying that the origin and the destination must be linked. Costs to overcome distance must not be higher than the benefits of related interaction, even if there is complementarity and no alternative opportunity. Transport infrastructures (modes and terminals) must be present to support an interaction between B and A. Also, these infrastructures must have a capacity and availability which are compatible with the requirements of such an interaction. The goal of spatial interaction is to explain spatial flows. They provide ways to measure flows and predict the consequences of changes in the conditions generating them. Transferability refers to the cost of overcoming distance measured in real economic terms of either time or travel cost.

Settlement functionality is dependent on a good, effective and functioning transport system. Adedeji et al. (2014) stated that sustainable rural development is a function of a number of factors in which trans-

portation is of importance. They went ahead and stated that efficient and effective rural transportation serves as one of the channels for the collection and exchange of goods and services, movement of people, dissemination of information and the promotion of rural economy. Along this line of the relevance of transportation to development, it can be argued that effective transportation eases accessibility to inherent potentials of rural areas which could be harnessed for the development of its economy. In other words, rural transportation provision forms an intrinsic part of rural development strategies, serving as a mechanism and catalyst for rural transformation through the reinforcement of rural development and contributes to poverty reduction by enhancing both equity and efficiency outcomes.

Pushing forward the relevance of good transport infrastructure, Lucas (2010) in his explanation of the concept of transferability, he mentioned that the second factor necessary for an interaction to take pace is transferability. In some cases, it is simply not feasible to transport certain goods (or people) a great distance because the transportation costs are too high in comparison to the price of the product. In all other cases where the transportation costs are not out of line with nee, we say that the product is transferable or that transferability exists. Adedeji et al. (2014) assert that rural transport and infrastructure development in Nigeria have being topical issues and have been identified by many as crucial components for the economic development of the country. According to Oluwasola et al. (2008), a major policy omission in Nigeria is the absence of policies deliberately targeted at fostering rural-urban linkage to improve the income earning potentials of the rural areas through the increased output to satisfy the urban market. Usman et al. (2013) ascertained that rural transport is important for the evacuation and marketing of farm products and the delivery of farm inputs and extension services. It also aids innovation diffusion, expand production and raises incomes (Olukotun, 2007; Osabohien, et al., 2018). In Nigeria, Osabohien, et al. (2018) reported that poor condition of road infrastructure along with rural geographical isolation have contributed to household poverty. It was proposed that improving feeder roads will enhance rural farmers' productivity and profits.

In Bangladesh, studies (Ahmed and Hussain, 1990; Khandker, et al., 2009) reported that rural communities with better access to markets, education enrollment and basic services have lower poverty levels. Such communities had higher agricultural productivity, higher household incomes, better health and higher participation of women in economic production. Ahmed and Nahiduzzaman (2016) went further to report that rural accessibility enhanced through road projects will promote the achievement of SDG goal by limiting rural exclusion. Similarly, in village level surveys carried out in Burkina Faso, Uganda and Zambia, good roads were seen to raise the economic opportunities for people in rural Africa (Barwell, 1996). Improvement in transport stimulates economic development in rural areas through the expansion of opportunities for income and employment. In Peru, Cambodia, and China, some authors (Qin and Zhang, 2016; Flachsbarth, et al., 2017; Idei and Kato, 2018) mentioned that rural roads impacted positively on agriculture, promoted farming income, raise people's welfare level and enhanced non-farm income diversification which resulted in declining poverty index in rural China.

In Nigeria, the issue of rural transportation development has continued to be of national importance. For instance, most of the rural roads are in poor condition, and this has imposed significant cost on the national economy especially to the agricultural activities due to increased vehicle operating costs and travel times (Akintola, 2007). Adedeji et al (2014) argued that the rural areas are indispensable in the supply of food, raw materials to urban centres and the country's economic growth as a whole. The condition of rural transportation has frustrated rural development efforts in the country and this has resulted into series of challenges such as the cutting off of many rural areas in the country from neighbouring larger settlements from which they could access higher order socio-economic services, low productivity,

low income and a fall in the standard of living of rural residents and high rate of poverty (Aderamo and Magaji, 2010). Considering the above, it becomes expedient to examine rural transportation problems, so that the extent of the problems can be known, and possible solution proffered to achieving sustainable rural development.

Rural transportation problem in Nigeria relates generally to the provision of access to natural resources like minerals, agriculture, forestry and the provision of access for the rural population so that they can access services at affordable rate. Findings by Ovubude (2000) in Adedeji et al. (2014) have shown that the movement of passengers and freight in rural areas of Nigeria are comparatively smaller than those of intra-urban movement. People in rural areas travel less than their urban counterparts and this is not independent of the absence of reliable and easily affordable means of motorized public transport in those areas. The distance over which motorized transport is required within the rural areas is relatively shorter because of the small and compact nature of the rural settlements generally. Rural transportation problem is accentuated by the dispersed spatial derivation of traffic, this is conditioned by the nature of rural environment and economy, bulkiness and perishable nature of rural product, imbalance in inflow and outflow, and marked variability in demand for transport.

Intervening opportunity principle avers that there must not be another location that may offer a better alternative as a point of origin or as a point of destination. For instance, in order to have an interaction of a customer to a store, there must not be a closer store that offers a similar array of goods. If location C offers the same characteristics (namely complementarity) as location A and is also closer to location B, an interaction between B and A will not occur and will be replaced by an interaction between B and C. This principle presents the roles played by urban farming, modern super stores sale as an outlet to source for food by urban dwellers.

In South Africa, it is estimated that food damages to its road systems from overloaded trucks amounts to annual losses of R600 million (Louw et al. 2004). Many small traders buy peri-urban agricultural produce because they do not have the capital required to transport products over long distances. In a study of traders from Benin, Malawi, and Madagascar, few had weighing equipment, transportation, or storage facilities. Transport costs were the largest share of marketing costs followed by personal travel costs of the trader (Fafchamps et al., 2005).

According to SARRNET, traders in Tanzania preferred to buy cassava from areas closer to Dar Es Salaam at 30 USD per metric ton as opposed to farmers from the Rufiji district at 10 USD per metric ton because the poor road linkages greatly increase the transport costs (SARRNET 2004; Romanik, 2008). In Ethiopia, rural road enhanced households' welfare and resilience to environmental shocks (Nakamura et al., 2019) and vice-versa in road infrastructure limited rural areas.

FINDINGS AND DISCUSSIONS

This section examines the effects of road transportation on the flow of farm produce from rural areas to urban markets. It also identified the problems facing traders in the transportation of farm produce. The average distance travelled, and cost of transportation was also investigated. This section thematically through narrative experience of both the researcher and respondents presents analysis of various data collected from the field. Descriptive analysis where complimented by interviews conducted.

Locational and Demographic Characteristics of Respondents

A total of 250 copies of questionnaires were administered in 10 urban markets of the five (5) local government areas of Ibadan, namely: Ibadan North, Ibadan North-East, Ibadan North-West, Ibadan South-West, and Ibadan South-East. This was made possible because the questionnaires were administered by the researcher themselves and with the assistance of a supervised field assistants. It is no longer gainsaying that rural areas are dependent on the urban centres for product demand. To meet the demand placed by urban markets, traders often shift focus to the adjoining places of farm production to supply them the produce. The question as to the origin of purchase of farm produce shows that the adjoining rural areas are the supplier of the urban markets. The responses present 11.2% purchase their produce from Onidundu in Akinyele local government area, Iware (34.4%), Total (13.4%), Owena (3.2%), Akinyele (6.4%), Olanla (6.4%), while the remaining 24.8% buys from other sources such as Ikire. Although based on classification, the locations of purchase are within the rural LGA, informal discussion with the urban traders perceive that the market of sale can be said to be urban as all the 250 respondents was of the view. The urban perception can be said to be based on the nature of demand and outlook of the market environment.

Table 3. Location and business history where farm produce is bought

Trading location among respondents			**Respondents Trading Experience**			**Average Monthly Income Distribution**		
Farm market location	**No.**	**%**	**Number of years in trading**	**No.**	**%**	**Income of respondents**	**No.**	**%**
Onidundun	28	11.2	Less than 5years	113	45.2	Less than #5000	94	37.6
Iware	85	34.4	6-10 years	99	39.5	#5000-#15000	48	19.2
Total	34	13.4	11-20 years	16	6.4	#16000-#25000	100	40.0
Owena	8	3.2	Above 20 years	22	8.8	#26000-#35000	4	1.6
Akinyele	16	6.4	**Total**	**250**	**100.0**	Above #45000	4	1.6
Olanla	16	6.4				**Total**	250	100.0
Others	62	24.8						
Total	**250**	**100.0**						

Source: *Authors' Field Survey*

The socio-demographic configuration of the sampled respondents reveals that many (76.8%) of the respondents are married, many (65.6%) of who are women.Women are often known for their trading capabilities across ages. The economic rationality and quest to meet daily human needs is no restricted to any age grouping and this reflects in the 6.4% aged below 30years, 82.4% between age 31 and 50years and the remaining 11.2% are above 50 years of age. The analysis buttresses that young people less than 50 years (youths) engage in trading of farm produce. Table 3 presents that despite the youthful age composition of the respondents, majority (84.7%) of the respondent have been in the business for less than 10 years while the remaining 15.3% had been in family between 11-20years (6.4%) and over 20 years (8.8%). Although despite the many years in business, evidence shows a high percentage (57.6%) of the respondents either attended adult literacy (44.0%) or primary school (13.6) education while only 1.6%

had post-secondary education experience. This finding presents a preposition that food crop trading can be said to be traditional and mainly practised by less educated people in Ibadan. This finding was also reported by Wahab and Popoola (2018) that illiteracy among urban farmers in Ibadan has limited their adaptation to climate change. This study as presented in the analysis revealed that illiteracy among food crop traders is also high. A hypothetical statement that the research argues accounted for the majority (as only 1.6% earn above #45,000 in a month) of the respondents been classified are low income earners despite their over a decade farming experience (See Table 3).

Origin-Destination Food Chain Analysis

From the field observation, the researcher classified the food crops into tomatoes, fruits, vegetables and grains based on the traders interviewed. It was observed that while some sell only on crop (fruits or grain) some sell a combination of two or more farm produce (for example tomatoes and vegetable sellers). Responding, a tomatoes seller stated that the factors such as demand, profit and season determine what can be patronized. In her words she said "Ah… I sometimes sell ugwu and "efo-green" (a type of vegetable) but my main item of sale is tomatoes, I just add the vegetables to it in my stall or inside tray outside…" Another trader said that she sells vegetable so as to encourage his husband and children. They family has a vegetable farm along the floodplain of University of Ibadan and Samonda. She reported that she sometimes serves as a supplier to the vegetable sellers in the market, but she mainly buys her tomatoes from Onidundu village and another village in Egbeda. In her words she has this to say:

"… Supplier le mi (I am a supplier) … I just sell small vegetable here, I mainly supply to other market people… my husband and son are vegetable farmers, so they bring in the morning while I help them sell and collect money (with small additions on cost as personal gain to her she reported) …" **Tomatoes Trader**

This statement represents a form of household collaboration and representation in food production, marketing and consumptions. Economic rationality and quest to meet daily human needs by urban traders are subjected to some factors. Asked about certain factors that influence demand, traders designate demand, price or distance. From the above, distance was identified as a major determinant to market volume. A driver stated that the farther the distance the higher the cost of transportation.

Downplaying the role of farmers, a trader offloading her grains said the farmer is always willing to sell no matter what as he or she cannot consume all the produce, but it the place is far the cost of transportation is high and this indirectly influences the cost of delivery. One of the respondents who is a rural commercial driver said, "… *Ona Oko O wule Da A Mo yen* (meaning the roads linking to the rural villages of purchase are generally bad) *SuGbon To Nab A Tun Jin, Owo OKO Yo Won Gan (*But if the place is now far, the cost of transport is always high) and this might affect the trader capital budget…". Asked how to quantify distance, he stated that they are familiar with the route owing to history of interaction with a seller. When the trader was asked the effect of distance on delivery cost, she said bluntly "…*NikanTi A Ba Na Ni A O Ta OOO* (meaning it is what is delivered and cost of delivery that is been sold that is determines cost of sale) …"

Why the origin of purchase is usually within the rural areas, source of purchase can be from immediate household farms (28 traders), close fellow farmers within rural areas (199 traders), wholesalers (9 respondents) or from other sources such as from fellow retail market sellers and traders associations

(14 respondents). The researchers denote that the choice of which rural area to patronize is usually dependent on ease of accessibility, modal transportation availability and cost. The argument is that movement of goods and services from places of origin to destination is dependent on efficient and good road infrastructure. From the sampled respondents as presented in Table 4, 87% reported that bad road condition of rural connector and access roads are a major transport problem, while the remaining 13% identified that the state of the vehicle that ply this routes are nothing to write home about. Infact, it was argued by the traders (48%) that continuous axel overload is a major limitation to effective mobility of farm produce from rural to urban market, another 51% states that bad road is the problem associated with the flow of produce from rural areas to urban markets, while the remaining 1% complained about numerous police check-points.Drawing from the respondents' statements it was identified that the major problems associated with the flow of farm produce from rural areas to urban markets majority are bad road and axle overload.

Table 4. Problems associated with the flow of farm produce from rural areas to markets

Variable	Bad road	Over loading	Checking point	Bad vehicle
Transport problems experienced	217 (87%)	-	-	33 (13%)
Rural areas-urban market food flow problem	127 (51%)	121 (48%)	2 (1%)	-
What is the nature of problem encountered in flowing farm produce	241 (96%)	9 (4%)	-	-

Source: *Authors' Field Survey*

Although the most common form of transportation is the use of chartered public buses. It was reported that the choice of mode is often dependent on the proximity from the origin to destination. Most the traders engage in collective transportation in order to ease the cost of transportation. Responding on choice of transportation and cost effect, a trader stated thus:

*"… Sometimes when we finish buying from the farm the last bus at the bus stop will have gone to Ibadan which now make transportation difficult as sometimes, we might need to wait till the next day or even days when negotiations are not favourable to us… as the drivers also inflate cost…. so, what some (4-5 traders) of us now do is that we have a permanent transporter who has a pick-up (4X4 open-back Van) that we all use… we come together on a fixed market day and when he should come pick us…. We all charter together and this has greatly reduced our cost of transportation, reduced waiting time, reduce number of spoiled produces, increase our profits and also indirectly reduce cost of delivery…"***Food crop Trader***

Transportation Characteristics

Responding to how it has reduced the number of spoilt produces, a driver said most tomatoes seller owing to scarcity, seasonality, limited availability and poor effectiveness of public transportation along rural roads have to depend on the same taxi with grains sellers. He said in many instances, the weight of the grains ends up meshing the tomatoes and also the vegetables there by increasing their produce loss.

This statement was confirmed in Table 5 as inference shows that only 18% of the participants agreed that means of transportation are readily available. Also when available, it is considered very effective by 16%, effective by 68%, and ineffective by the remaining 16%. The effectiveness in this regard was measured based on the nature of the vehicle and the state of the road in which it travels on. All of which is defined by the chartered vehicle used by traders, driver's choice of route and how much it tend to dictate and influence the cost of delivery.

Ability of traders to pay for available transport means is an important factor in flow of produce, but the availability of the transport mode is another imperative factor. Interview with a driver when asked of the reason why there are limited and seasonality in rural public transport, he said the nature of road dictates the availability of transport means as drivers prefer to ply roads that a motorable and will not damage their cars. In his words he stated thus:

*"… Many things determines this, the season (if raining season drivers including me don't like going to some villages), number of police, village or military check-points (as this increases amount paid for bribery for lack of vehicle documentations), road condition (paved or unpaved) and road security (instances where there are cases of robbery on the road)…"***Driver**

A farmer also reported that the effect of bad roads not only lead to spoiling of farm produce in transit but also indirectly affect cost of produce cost and also the farmers output (how much is produced and profits). He recorded that at several instances he might have harvested waiting on a trader to come purchase only to be informed that the road is bad or that the driver can't come done to the village owing to bad road network. This he said affects production, household income, livelihood survival and often result into debts. He said thus:

*"…Wahala Ona yipo gan, Ojaowa ko ni se Olubara, ke sis se be, Ona ni o Daa (The problem of this road is plenty, sometimes, there are goods to sell but no buyer, and It's not that no buyer but th road is bad to connect them…. Igbamiran to ba tip e nile, a kantaa mole nii Owoti o To kan, kin gbogbe ma lo baje (Sometimes, we have to sell the produce at ridiculous price when we don't see our main buyers to buy and we have already harvested) …"***Rural Farmer**

Table 5. Availability of transport mode

Availability of transport	**Frequency**	**Percent**	**Effectiveness transport**	**Frequency**	**Percent**
Readily available	46	18	Very effective	40	16.0
Scarcely available	204	82	Effective	170	68.0
Total	**250**	**100.0**	Not effective	40	16.0
			Total	**250**	**100.0**
Summary of what transport cost account for in delivery price of					
Variable			**Frequency**	**Percent**	
Less than 10%			208	83.2	
11 – 50%			42	16.8	
Total			**250**	**100**	

Delivery price can be defined as the selling price of produce at the market. From the sampled respondents, many (94%) opined that transport cost affect selling price of produce. This is because transportation accounts for 10% changes in delivery cost according to 83.2% of the traders and 11 – 50% of the final selling cost by the remaining. The variance in the effect of transport on delivery price is because traders consider distance between farm and residence or market which sometimes takes more than 2 hours as reported by 90.4% of the sampled traders.

The average time travel from residence to farm is dependent on the location of the farm, whether it is located in the same local government area as the residence or in a different local government area. It also shows that travel time of most of the farm produce sellers is above two hours. It was observed that majority of the traders buy their produce outside Ibadan. Of the sample, 215 respondents purchase their produce outside Ibadan (conceptualized and seen as the metropolitan urban or city area) while the remaining 34 buy within Ibadan. For those that buy outside Ibadan, locations where they buy includes Onidundun, Iware, Total, Akinyele, Ikereku, Olanla and Owena. All of which are located within the rural area or outside the state capital. Many of the traders attributed ready supply and cheap cost as to the reason for purchasing outside Ibadan. Speaking, a rural farmer that was accidentally met at the market said the rural areas have the capacity to produce some produce (mainly grain, vegetable, cassava, yam and pepper) for Ibadan consumers and the neighbouring towns. In his words he stated thus:

*"… Melo Ni W Ni Ibadan Ti A O Le Pese Ounje Ti A O Je, Ile Lo Perese Ti A o TI Da (What is the population of Ibadan that the rural farmers cannot farm and produce what they will consume, there are many unfarmed rural land)… Ti Awon Oloja Ban Wa Daadaa, A O pese re eeee (If the traders were coming continually and steady demand, the rural farmers will produce foods)…"***Rural Farmer**

This statement according to the farmer connotes and presents an undertone of a shortage in demand from urban areas to rural areas of Ibadan. Although traders are rational about the cost of transport, various factors explain this cost of transporting agricultural products from origin to destination, among these, poor roads, destination, bargaining power, demand and the season of years.. According to the responses gathered in Table 6, bargaining power, season of the year, demand, destination and bad road in that order are the factors that determines the cost of transportation.

Table 6. Factors that determines cost of transportation

	Bad road		Bargaining power		Destination		Season of the year		Demand	
Response	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Agree	205	82.4	248	99.2	244	97.6	248	99.2	244	97.6
Disagree	44	17.6	2	.8	6	2.4	2	.8	6	2.4
Total	250	100	250	100	250	100	250	100	250	100

Source: *Authors' Field Survey*

To ascertain the relationship between distance travel and cost of transportation of farm produce, correlation analysis run shows that there exists a weak relationship between distance travel and cost of transportation (Table 7). This shows that there exist other untested variables that account for cost of transportation.

Table 7. Correlations between distance travelled and cost of transportation

			distance in km	how much does it cost you to transport your farm produce to the market
	distance in km	Correlation Coefficient	1.000	-.098
		Sig. (2-tailed)	.	.126
		N	246	246
	how much does it cost you to transport your farm produce to the market	Correlation Coefficient	-.098	1.000
		Sig. (2-tailed)	.126	.
		N	246	250

Source: *Authors' Field Survey*

Buttressing this, a driver said sometimes the main factor that account for cost of transportation can be road-blockage and season. He said transport cost is usually high during raining season and that if there are many check-points the drivers always account for the loss from the trader through a hike in transport cost. He also reported that should the car or bus get spoilt on the road, some drivers are in negotiation with the traders to repair it and this sometimes add to the cost of transportation. He said the sometimes, agreement by drivers during the associational meeting might dictate cost of transportation as in some cases if a new association due or fee is introduced, drivers agree in their meetings to increase transport cost by ascertain percentage in order to accommodate the cost.

All this also indirectly influences the delivery cost and also choice of urban market supply. A trader said, in order to recuperate back her capital and more profit, traders do a quick market survey through phone calls to know the cost of sales and delivery cost at various markets in Ibadan before going there to supply. She said through this, traders create a form of scarcity to create a price hike in a market such that the market with the highest delivery cost is supplied the produce. These assertions are widely true as Figure 5 shows that 64.8% of the respondents reveals that the price dictates the choice of market to supply.

CONCLUSION AND RECOMMENDATION

In conclusion, traders identify improved road condition, drainage facility and workable traffic policy that eliminate road blocks as the factors that can help enhance the smooth flow of farm produce from rural areas to urban markets. The socio-economic development of any society depends largely on the nature and structure of the transportation network of the society since it provides the arteries through which the economic life stream of the society flows. Transportation is an indispensable element of development and socio-economic growth. As engines of economic integration, transport infrastructure and services facility constitute a precondition for facilities trade and persons. Transport development is

national and regional trade in a radically changed global environment. Transport infrastructure remains pillar of development with a view to accelerating growth and reducing poverty. Strategic planning and proper management processes needs to be in place in other to appropriate a good rural-urban market system as well as leaving a sustainable progress and development.

Road transportation has been described as a form land transport which involves the movement of people and goods by motor cars, trucks, buses, three wheelers motor cycles and bicycle. The government should provide good road networks to facilitated free movement of farm produces to urban market and transportation is catalysis' to development of any sociality. The government at various level, agencies and ministry of transport should take look at road network in their community to boost the flow of farm produces to urban market. The government should provide public transport to meet high traffic demand which the market and farm are facing in transporting their farm produce to market. The government should create a policy which will rise to fight the shortcoming facing transportation system in the country apart from transportation problem government should create storage facility to preserved that are in surplus.

Figure 5. Factors that influence the choice of the market supply?
Source: *Authors' Field Survey*

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