FREIGHT TRANSPORTATION FLOW OF AGRO-BASED COMMODITIES FROM KADUNA STATE, NIGERIA

BY

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AN M.Sc. DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE MASTERS IN SCIENCE DEGREE (M.Sc.) IN TRANSPORT MANAGEMENT.

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Declaration

I, Masugari, Danjuma Yakubu declare that this dissertation has been written by me and it is a record of my research work. It has not been presented in any previous award elsewhere. The sources of information have been duly acknowledged and referenced.

…… …….

Masugari, Danjuma Yakubu Date

Certification

This dissertation titled the *"Freight transportation flow of Agro-based communities from Kaduna State, Nigeria"* meets the regulations governing the award of the degree of Masters in Science in Transport Management of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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Dedication

This work is dedicated to Almighty God, the source of my strength, knowledge and wisdom that enabled me to undertake this research work. I, also dedicate to my late father, Mr Yakubu Masugari, my mother, my wife, Mrs Sarah D. Masugari and my children Racheal, Grace and Isa'ac.

Acknowledgement

With God all things are possible, I remain and will ever remain grateful to God for His infinite mercy and favour upon my life throughout my study period. My gratitude goes to my able supervisors Dr. Ibrahim Musa Jaro and Dr. Andrew Egba Ubogu for their immense contributions, through guidance, corrections and suggestions which has led to the completion of this work. My appreciation goes to all the lecturers in the department.

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Abstract

Transportation and distribution of agro-based commodities is very necessary for the survival of any community. This study attempt to analyse freight transportation flow of agro-based communities from Kaduna State, Nigeria. The objectives are to: Determine the inter-regional freight flow of agricultural commodities in the distribution hubs, identify the modes of transport used in generating and distributing freight to and from the hubs,establish the sphere of influence of the four distribution hubs,and examine the problems militating against the inter regional freight transportation of agricultural commodities in the study areas. Data were obtained from both primary and secondary sources. Information were gathered from transporters and traders surveyed in four major distribution hubs, namely Saminaka, Soba, Makarfi,and Giwa using systematic sampling technique. In all, 345 were successfully interviewed, 165 for transporters and 180 for the traders. Data collected from the questionnaires were analysed using simple descriptive statistics. The findings shows that out of the 165 respondents sampled on the issue of truck ownership, 80.6% of them lay claim to their vehicles while 58.2% respondents use canters. The heavy trucks are mostly involved in long distance haulage travel especially to states like Lagos, Rivers. Borno etc. while the canters transport agricultural commodities to definite locations like Kano, Abuja, Nasarawa, and Katsina. Grains are mostly supplied from the four distribution hubs with 161 respondents attesting to the fact. Similarly, analysis on the major logistical problems faced by transporters in the distribution of agricultural commodities from the four distribution hubs reveal that frequent checkpoints resulting to harassment by law enforcement agents is higher at 28.48% followed by armed robbery attack indicating 21.82% while Federal Road Safety Corps (FRSC) causes most problem during the flow of agricultural commodities for the respondents with about 36.36% of them indicating to it. Finding shows that 40% of the traders involved in the marketing of agricultural commodities are retailers and 80.5% of the respondents buy agricultural commodities for trading in the market. Findings also indicates that 58.3% of the respondent say they do not have any storage facilities in their distribution hub while 41.7% of the respondents say they have where to store their goods.The implications of this findings are that local, state and federal government as well as private sector should invest more in the transportation and distribution of agricultural commodities by improving road condition, enhance the productivity of the transporters through the Sure-p programme to attract more youth into the transportation business while also providing storage facilities, parking space for vehicles and proper training of law enforcement agents and drivers.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Logistics consider a wide set of activities dedicated to the transformation and circulation of goods, such as the material supply of production, the core distribution and transportation function, wholesale and retail and also the provision of households with consumer goods as well as the related information flows (Handfield and Nicholas 1999). Kareem (2010) defines logistics as the process of strategically managing the movement and storage of raw materials, component parts as well as finished goods throughout a business from suppliers to final delivery to customers. Logistics play an important role in getting the right product, in the right quantity, in the right condition, to the right place, at the right time to the right customer at the right cost.

Distribution involves a number of activities centered on the physical flow of goods and information. At one time, the term distribution applied only to the outbound side of supply chain management, but now includes both inbound and outbound (Sumaila, 2007). Ripol (1999) suggested that commercial distribution is based on socially necessary movement of goods from where less necessary to where they are more necessary. It is a bridge between production and consumption. Kareem (2010) opined that distribution is about making products available in their markets, Put simply, it is getting the right product to the right place at the right time. The author stressed further that

distribution is applied to broad range of activities concerned with the efficient movement of finished products from the end of production line to the consumer. The activities include freight transportation, warehousing, material handling, protective packaging, inventory control, plant and warehousing location, order processing, market forecasting and customer service.

The significant role of transport in the physical distribution of agricultural commodities cannot be over emphasized. Similarly, Ajiboye (1994) argued that it is a key factor in all aspect of development and that there is hardly any sector of development that does not require the services of transportation because it plays a key role in connecting areas of production and areas of consumption. Transportation plays a key role in getting land into production, in marketing agricultural commodities and making forest and mineral resources accessible (Musa, 2009).

Hesse and Rodrigues (2004), argued that the growing flow of freight have been a fundamental component of contemporary changes in economic systems at global, regional and local scales. Ola (1978), also suggests that regional area differentiation of places create localized surpluses that can be transferred to deficit areas and this agrees with the concept of complementarity. The basic assumption here is that trade will be enhanced where commodity composition of export in one region fits the import need in another region. The movement of agricultural products from Kaduna state obeys this concept. Onokala (1988), agrees that transportation plays a vital role in the marketing and distribution processes which stops only when the commodities and goods have reached

the consumer. Ojekunle (2004) noted while reviewing urban freight flow in Nigeria that the location of market and industries act as the threshold of demand. Markets and industrial zones constitute major freight generating and attracting nodes.

Therefore, freight transportation is a liberating force, setting free natural, man-made and human resources from situation where they yield little or no satisfaction and transferring them to places where their full utility can be realised. Freight transportation includes the demand for the movement of goods from the place of origin to the destination and this mainly includes shipment through transportation mode owned or hired by the agent or customer. Freight transport is absolutely essential to modern urban civilization. No urban area could exist without a reliable freight transport system (Michael, 2008).

Musa (2009), pointed out that in Nigeria, agricultural produce constitute a significant percentage of commodities of inter-regional trade transported by road. The author gave examples of these agricultural commodities as potatoes, tomatoes, vegetables, fruits, Others are cattle, sheep, and goats, grains, cereals, tubers, and nuts to mention only a few. Haruna (2010), also revealed that Kaduna state has good physical condition for agricultural production with about 75 percent of the population involved in farming activities which involves buying and assembling of agricultural commodities and transporting them to different regions of Nigeria. The author identified two types of freight flow of agricultural commodities. First intra-regional movement of agricultural commodities from the production villages to the assembling points and secondly

inter-regional flow which involves the transportation of assembled commodities to other regions.

Saminaka, Soba, Makarfi and Giwa areas of Kaduna state have high potentials for agricultural production. These agricultural products are however moved from one location to another within the framework of freight transportation management. The agricultural commodities are by nature bulky and some are perishable and therefore need to be transported from areas of production to areas of consumption with the least delay and cost. That is why effort is being made to examine the inter-regional freight transportation pattern of Agro-based communities from Kaduna State, Nigeria.

1.2 STATEMENT OF RESEARCH PROBLEM

Otitolaiye (2009), observed that agricultural products distribution is very necessary because there is a gap between the producer and most of the consumers. These gaps could arise from spatial and/or time separation. Spatial separation involves a physical separation between areas of production and consumption. For instance, fish and seafood are obtained from the coastal areas like Lagos and Warri and are sold throughout the country. Also, vegetables like onion, tomatoes, pepper and livestock products are obtained from Sokoto, Kano, Katsina, Adamawa etc. and sold in Southern Nigeria.

As regards time separation, consumption is a continuous process but production is discrete particularly the perishables and hence, time adjustment and some elements of storage is ultimately needed to accommodate supply and demand. This call for an

efficient distribution system to better both production and consumption for the sustenance of agricultural production.

Saminaka, Soba, Makarfi and Giwa areas of Kaduna State have high potentials for agricultural production. This is as a result of the conducive climate, and fertile soil, with most of its population involved in farming activities. These areas have hubs which generate the flow of agricultural commodities in and out of them on periodic and timely basis. The agricultural commodities are by nature bulky and some are perishable and therefore need to be transported from areas of production to areas of consumption with the least delay and cost. A number of studies have been carried out in relation to production, marketing and distribution of agricultural commodities. For instance, Michael (2008), carried out a study on freight flow pattern of agricultural commodities in Giwa and Maigana markets. The study revealed that poor condition of road and high cost of transport among others are a serious threat to the marketing of agricultural commodities. Dogonyaro (2008), carried out a study on the physical distribution pattern of agricultural commodities in Kasuwan Magani market and identified poor condition of roads, high cost of transportation and spoilage of foodstuff, inadequate storage facilities, and inadequate parking space for trucks amongst others as problems that affects the flow of agricultural commodities.

Haruna (2010), identified the problems associated with the inter-regional movement of agricultural products from Zaria. The study identified high cost of transport, lack of efficient storage facilities, high cost of storage, poor road conditions, armed

robbery attacks and harassment by law enforcement agents as some of the problems militating against effective distribution of agricultural produce. Haruna (2010), further revealed that it would be necessary for local, state and federal governments as well as the private sector to invest heavily in road improvement; build more storage facilities of better quality and provide more parking spaces for vehicle as well as providing proper training for drivers and law enforcement agents.

Musa (2009), study the role of transportation in marketing and distribution of tomatoes in Nigeria identified slow loading and offloading system, obstruction on the road, stages in the distribution channels, poor accessibility to producing areas among others as problems associated with the distribution of tomatoes.Musa (2007), also carried out a study of the role of improved road development on agricultural produce marketing in greater Zaria. The main agricultural commodities considered in the study were maize, beans, groundnuts, millet, Rice, and Sorghum. The study revealed that maize is the main grain produced in the area. The result of the study shows that Makarfi distribution hub has the highest average number of bags of maize handled.

Ubogu (2010), studied the problems associated with unimodal transportation of port hinterland freight in Nigeria; the study observed traffic delays, frequent road check points, accidents, pilferage, armed robbery attack, as some of the problems facing goods transported using a unimodal transport mode. The study revealed that the use of multi modal choice of distribution would make goods reach their destination in time in terms of effective scheduling, reduce cost and with minimum effort.

Nevertheless, these studies have examined specific areas of agricultural and general distribution system. Similarly, some of these studies earlier cited only examined freight flow from isolated hubs/markets in their study. This study thus attempts to fill the gap by examining the inter-regional freight transportation pattern of agro-based commodities from Kaduna State, Nigeria and this is with a view to examining how freight is generated, how it is being distributed, where it is being distributed to and by what mode or means. The following research questions are designed to guide the research.

i. What is the nature of inter-regional flow of freight handled by the four (Saminaka, Soba, Makarfi, Giwa) distribution hubs in Kaduna state?

ii. What is the sphere of influence of the four distribution hubs within and outside Nigeria?

iii. What are the logistics of freight flow in the four distribution hubs in Kaduna state?

iv. What modes or means of transport are used in generating and distribution of freight in the four distribution hubs? and

v. What are the problems associated with the free flow of agricultural commodities in the distribution hubs?

1.3 AIM AND OBJECTIVES

The aim of this study is to analyse inter-regional freight transportation flow of agro-based commodities from Kaduna state, Nigeria. The specific objectives are to:

i. determine the inter- regional flow of agricultural commodities in the distribution hubs,

ii. identify the modes of transport used in generating and distribution freight to and from the hubs,

iii. determine the sphere of influence of the four distribution hubs, and

iv. examine the problems militating against inter regional freight transportation of agricultural commodities in the study areas.

1.4 JUSTIFICATION OF THE STUDY

In Nigeria, the transport sector is of great importance to the movement of agricultural commodities and the growth of inter-regional trade which brings about the development of both source areas and destination towns and cities. It is quite significant to ensure that there is free flow of freight which will enhance market activities. Despite huge sum of money spent by federal, state, local government councils and recent

development in the road sector, transporters face a lot of challenges in the distribution of agricultural commodities.

The economy of Kaduna State is primarily agricultural in nature, although it has a significant and growing urban sector, its agriculture is characterized by small holders who produce for subsistence, domestic and inter regional markets. This therefore ties the welfare of the state to agricultural development. The study focuses on the distribution of agricultural commodities and is intended to show how these commodities are distributed within the production areas to other regions of Nigeria. The study will directly or indirectly be of great significance to the farmers or producer of Agricultural products, Traders of Agricultural commodities, Transporters, handlers and keepers of the commodities. The consumers of Agricultural products, economy, society of Kaduna state and Nigeria. The wider society and researchers.

1.5 SCOPE OF THE STUDY

The study examined freight transportation Flow of Agro-based communities from Kaduna State, Nigeria. It specifically looked at the flow of all kinds of agricultural produce (particularly food crops such as Maize, Rice, Beans, Tomatoes, Pepper e t c) and emphasis was placed on the type of crops, their sources, and their destination, mode of transportation, storage, and channels of distribution within and outside Nigeria.

In terms of content scope, the study determine the pattern of inter- regional freight flow of agricultural commodities in the distribution hubs, identify the modes of transport

used in generating and distributing freight to and from the hubs, determine the sphere of influence of the four distribution hubs, and examine the problems militating against inter regional freight transportation of agricultural commodities in the study areas to different parts of Nigeria and beyond.

In terms of spatial scope, the study covered Saminaka, Soba, Makarfi and Giwa main distribution hubs. However, there are few smaller hubs scattered around which serve as buffer areas to the main hubs which hold mostly on weekly basis and restricted to the main distribution hubs which are located at the headquarters of their local governments. The active period the field work covered is from November, 2013 to April, 2014.

CHAPTER TWO

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

2.1 INTRODUCTION

This section examines the review of literature and conceptual frameworks adopted in this study. The importance of road development as well as the role of transportation in the distribution of agricultural commodities are reviewed. Various concepts such as the concept of physical distribution, Ullman's theory of spatial interaction, the distribution centre concept, the Von Thünen model of rural agricultural land use as well as various channels of distribution of agricultural produce are also examined in this chapter.

2.2 CONCEPTUAL FRAMEWORK

Theories, models and concepts are tools used to mirror reality. In other words, the application and use of theories is necessary for the better understanding of this type of study. The need to provide adequate explanation on the significance of distribution in the flow of agricultural commodities from Kaduna state is the driving force for the search of these appropriate theories and concepts for this study. The following theories and concepts were useful for this study.

- The concept of physical distribution
- Ullman's theory of spatial interaction
- The distribution centre concept.
- The Von Thünen Model of Agricultural Land Use, and
- Channels of distribution of agricultural produce

2.2.1 The Concept of Physical Distribution Management

The concept of distribution is now seen by practitioners as all related activities concerned with economic movement of goods from raw materials to the production point for processing into finished products and the efficient movement of finished products from the end of production line along the channels of distribution to the final consumer. Sumaila (2007) reported that the central focus of the concept of distribution management is to increase the efficiency of time, place and delivery value. When demand and product availability are immediate, the producer can perform the exchange and delivery function itself. The author observed that distribution management can also decrease the overall channel complexity through sorting and effective route management. The purpose of physical distribution activities is therefore the bridging of gaps between the producer and the consumer thereby ensuring that goods reach the consumers at the right quantity, condition, place, time and also at the right price. A system is a set of component or activities that interact with each other. In a distribution system, six interrelated activities affect customer service and cost of providing it. Kareem (2010) described these activities as:

(i) ***Transportation:***

Transportation involves the various methods of moving goods outside the firm's buildings. For most firms, transportation is the single highest cost of distribution usually accounting for 30% to 60% of the distribution cost. Transportation adds place value to the product.

(ii) ***Distribution inventory:***

Distribution inventory includes all finished goods inventory at any point in the distribution system. In cost terms, it is the second most important item in distribution, accounting for about 25% to 30% of the cost of distribution. Kareem (2010)

(iii) ***Warehouses (distribution centres)***

Warehouses are used to store inventory. The management of warehouses make decisions on site selection, number of distribution centres in the system, layout and methods of receiving, storing and retrieving goods.

(iv) ***Material handling:***

Materials handling is the movement and storage of goods inside the distribution hub. The type of material handling equipment used affects the efficiency and cost of distribution.

(v) ***Protective packaging:***

Goods moving in a distribution system must be contained, protected and identified. In addition, goods are moved and stored in packages and must fit into the dimension of the storage space and the transportation vehicles.

(vi) ***Ordering process and communication****:*

Order processing includes all activities needed to fulfil customers' orders. Order processing represents a time element in delivery and is an important part of customer services. Many intermediaries are involved in the movement of goods and good Communication is essential to a successful distribution.

2.2.2 Ullman's Theory of Spatial Interaction

This theory was postulated by Ullman in 1956. The theory explains the reason why movement takes place within a geographical space. The concept establishes the three principles necessary before spatial interaction can take place. This theory has been used to explain the basis for movement between places within the framework of distribution and market mechanism. The three principles are complementarity, transferability and intervening opportunity.

The concept of complementarity is attributed to a real differentiation and mutual existence of supply and demand for each other region's product. The concept explains the fact that for two spatially separated regions to interact there must be demand in one area and supply in the other area. This implies that, geographically while some areas are naturally endowed with the ability to produce certain goods in surplus the other side is lacking in the production of such goods (Ullman, 1956).

In addition, the area that is at advantage in producing goods as explained above is also lacking in the production of other goods, which may be at the advantage of the other region. Therefore, there must be an exchange of products between these communities thereby leading to what is called regional integration. It is this complementarity of supply and demand that brings about movement and spatial interaction between the production point of cement products and the consumption centres.

The principle of intervening opportunity according to Ullman (1956) reduces potential interaction between two complimentary regions due to the availability of

alternative supply or demand centers. This could be obstacles to the possibility of interaction taking place between complimentary regions, should there be another area of supply standing in between them. This principle could be well explained using the example of agricultural products in the study area. Most of the customers get their supply from these areas of Makarfi, Soba, Saminaka and Giwa. The reason for all these location is that there is abundant supply of agricultural products at the lowest cost. However, the strength of the attraction (or repulsion in the negative sense) to these centre depends on the fact that there is any alternative point of supply in between these points (supply and demand). The availability of such alternative is called intervening opportunity.

As regards transferability it is the level of travel impedance. Transferability also refers to the ease at which friction of distance is overcome and the transferability of a product is largely determined by cost of movement (time and money). Thus, whenever, the time and money cost of traversing a distance is too high, interaction will be drastically reduced or in some area even non-existence, despite perfect complementarity and absence of intervening opportunity.

In conclusion, Ullman's theory of spatial interaction is based on the fact that regions cannot be independent on their own, that is why there is need for interaction to exist in order to gain access to things that are needed but not available in that location. This model therefore helps to explain the role of distribution in the efficient and effective movement of agricultural products from the point of production to the point of consumption.

2.2.3 The Distribution Centre Concept

The distribution centre concept is a new innovation in warehousing. Kotler, P. Armstrong, G.Sanders, J, and Wong,V. (1999) opines that the distribution centres are large, centralized warehouses that receive goods from factories, repackage them into orders and supplie them to customers quickly. The focus of this concept is on movement of goods rather than storage and as such it is designed for rapid flow of products in the sense that consumer will be well satisfied if he can get the products he wants at the right time with a minimum effort. The most important aspect of the distribution centre concepts is that it enhances customer service as well as increase sales level.

The Chartered Institute of Transport in (1997) observed that customer service involves all activities that seek to accept process, invoice customer order and follow upon any activity that has lesser efficiency. The concept ensures product availability by maintaining full product line to minimum, reduce costs, lower transportation cost, cut storage cost and also facilitate production by receiving and consolidating raw materials and providing final assembly for some products. The distribution concept is quite relevant to this study in that agricultural products are mostly channelled towards household use and they need to be reached and serviced adequately in other to improve customer satisfaction and improve service levels.

2.2.4 The Von Thünen Model of Agricultural Land Use System

Early in the 19th century Von Thünen developed a theoretical model that describes how market processes determine local land-use patterns. Johann Heinrich von Thünen was a skilled farmer who was knowledgeable in economics. His model was

created before the first large-scale industrialization and is simply explained in terms of agricultural land use around a central market city. Von Thunen's model was created before industrialization and is based on the following limiting assumptions:

- The central city is located centrally within an "Isolated state" which is self-sufficient and has no external influences,
- The isolated state is surrounded by an unoccupied wilderness,
- The land of the state is completely flat and has no rivers or mountains to interrupt the terrain,
- The soil quality and climate are consistent throughout the state,
- Farmers in the isolated state transport their own goods to market via oxcart, across land, directly to the central city. Transport costs thus rise linearly with distance,
- The selling price for the agricultural product is determined at the market by supply and demand, and
- Farmers act to maximize profits.

However, in an isolated state with the foregoing statements being true, Von Thünen hypothesized that the following pattern would develop into central city, intensive farming/dairying, forest, extensive field crops, and ranching/animal products

There are four rings of agricultural activity surrounding the city. Dairying and intensive farming occur in the ring closest to the city. The related products (vegetables, fruit, milk and other dairy products) have the highest profits, but also the highest transportation costs because they are vulnerable and perishable. Timber and firewood will be produced for fuel and building materials in the second zone. Before industrialization (and coal power), wood was a very important fuel for heating and cooking. Wood is very heavy and therefore difficult and costly to transport. The third zone consists of extensive field crops such as grain for bread. Since grain lasts longer than dairy products and is much lighter than wood, transport costs are considered to be lower, allowing a location further from the city. Ranching is located in the final ring surrounding the central city. Animals can be raised far from the city because they are self-transporting and thus have low transport costs. Beyond the fourth ring lies the unoccupied wilderness, which is too great a distance from the central city for any type of agricultural product.

The economic rationale behind the model is described in terms of profit and distance from the market. The profit consists of the (fixed) selling price minus the (fixed) production costs minus the (variable) transportation costs. The transportation costs increase linearly with distance. Originally, Von Thunen's model was only concerned with location. However, it is possible to derive the land rent from this model. The farmers that grow a particular product prefer to locate closer to the city, as their profit will be higher. Thus for land closer to the city, they are willing to pay a rent, the land rent, which is at most the profit they make at that location. The conclusion is that land closer to the city

will have a higher price than land that is located further from the city. In this simplified approach it is stated that land rent at a location will be equal to the local profit, being defined as:

R = Y * (P-Cp) – Y * (Ct * d), in which :.....(1)

R = land rent ($/acre)

Y = yield (ton/acre)

P = market price ($/ton)

Cp = production cost ($/ton)

Ct = transportation cost ($/ton/miles)

d = distance from town (miles)

Even though the Von Thünen model was created at a time before factories, highways, and even railroads came into existence, it is still an important model in geography. The Von Thünen model is an excellent illustration of the balance between land cost and transportation costs. The farmers of the isolated state balance the cost of transportation and land versus profit and produce which are the most cost-effective products for the market.

The original simplifying assumption of a homogeneous “featureless” plane in which the central city is located received a lot of criticism. Many deemed the resulting concentric land use patterns as being much too simple. The model can however easily be

adopted to include roads and rivers that might decrease transportation costs to some locations. Although, the use of the present mode of road transport to move agricultural produce is not cost effective to many locations but the use of this concept by the transporters and traders will facilitate the use of integrated mode of transport like the available railways thus bringing about reduction in the transportation cost to some destinations as well as reducing the level of travel impedance.

2.2.5 Channels of Distribution of Agricultural Produce

Distribution channels are a route through which goods move from the manufacturer to the final end user. Oyedijo (1984) observe it as the route through which goods move from the producer to the buyer and consist of series of institutions each of which performs separate marking tasks to facilitate the flow of goods. According to Otitolaiye (2009), agricultural products in Nigeria are produced by millions of farmers who are scattered all over the country. These produce are moved through specific routes between the producers and the consumers depending on the nature of the produce, location of production, financial capability of both the producer and the marketer to move the goods both far and near. The principal actors in the distribution of agricultural produce are the wholesalers, the retailers and the commissioned agents. In some parts of the country. The author identifies the following agricultural produce distribution channels.

(i) ***Direct channel*****:** From the producer (or farmer) to the consumers, and no intermediaries at all. This is common with fruits and vegetables, and fresh livestock products which are highly perishable. Farmer ⟶ Consumer

(ii) ***Short channel:*** The products are moved from the producer through the intermediaries before getting to the final consumer. This is favoured by products like yam, cassava and potato which have long shelf life.

This can be depicted as follows

Farmer ⟶ wholesale or retail ⟶ consumer

(iii) ***Long channel:*** Many intermediaries are involved in the movement of the commodities. This is favoured by products that can be stored for a long period of time such as grains, cotton, ginger, hide and skin and live animals.

Farmers ⟶ wholesaler ⟶ retailer ⟶ consumer.

(iv) **Channel with commissioned Agents:** This is popular among commercial "big" farms where production volume is large, Export crops normally pass through this channel. It is depicted thus:-

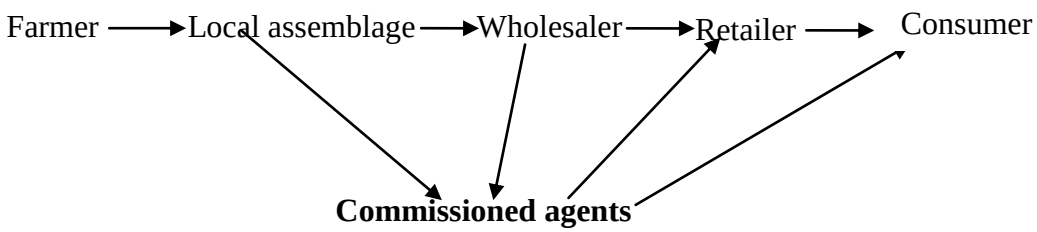


Figure 2.1 Channels of Distribution of Agricultural Produce

Source: Otitolaiye (2009)

All these channels discussed above exist in Nigeria in various degrees. These channels try to explain further that no matter the route taken by agricultural products, the main objective is that it moves from its production point to its final destination.

2.3 LITERATURE REVIEW

The review of literatures have established the fact that effective distribution system is imperative in the marketing of agricultural commodities, likewise the need to have an efficient transportation system put in place is required to get agricultural products to their destinations and points of sales. Road transportation also play a significant role in the sense that most of these agricultural products are moved by the road within the framework of freight transportation. Similarly, various concepts such as the Ullman's theory of spatial interaction explained the basis for any spatial interaction to take place, while the concept based on distribution channels explained the various levels of marketing interactions. However the concept of physical distribution, Ullmans theory of spatial interaction and the channels of distribution of agricultural produce are very relevant to this research. This chapter also elaborated on the role of distribution centers to the production and effective storage as well as movement of agricultural based.

2.3.1 Road Transport and National Development

Roads and highways serve as the arterial network of a nation. A country as large and diverse as Nigeria needs an effective road connectivity for both, national integration as well as socio-economic development. In India, roads are the most common mode of transportation which account for about 86% of passenger traffic and about 73% of freight movement (Sandhya, 2011). Musa (2009) assertes that transportation creates one of the greatest challenges in the various stages of the modern development and the formative power of economic growth and differentiating process. While Odugbemi and Ajiboye (1998) observed that it is the key factor in all aspects of development.

Nchouji (2002) observes that transportation in an economy is like blood in the human body. The author asserted that just as blood move nutrients and wastes from one part of the body to another to keep it healthy. So does the Transportation play the role of artery in the economic development of any nation. The dynamic nature of transport system has played and will continue to fulfil important role in the movement of agricultural commodities, but it has been a slow and laborious business. Agriculture and transportation are very vital to human lives. The distribution of agricultural commodities shall be successful if there is adequate transport system to facilitate the movement and distribution process (Haruna, 2010)

2.3.2 Road Transport and Agricultural commodities distribution

Road transport helps in the transportation of agricultural freight, services and people from one destination to another. The exploitation of the proportion of the

resources by the colonial administration led to the opening of some urban centres. This is confirmed by Weatherspoon and Reardon (2003) who noted that construction of roads, airlines and waterways have contributed immensely to the opening of areas which previously had no cash crop economy. In Nigeria, examples of such towns include Lagos, Enugu, Port Harcourt and Kano. Most of the resources (such as Cocoa, Oil Palm, Cotton, Kolanut and others) are being exploited today due to the improved accessibility. The problem of development is negligence of road development.(Musa 2007)

Alemayehu (1993), opines that in developing countries, agriculture is the largest sector of the economy and the largest potential in the internal market commodities. It supports the bulk of the population. It has the greatest growth propensity. Agriculture can provide part of the world capital and save foreign exchange needed for the development of other sectors. Agriculture provides raw materials needed by industries and also provide the food needs of workers in other sectors of the economy. This statement is of great importance when considering Nigeria at large and its rural areas as the sources of agricultural commodities.

Ukoje (1985) noted that the importance of agriculture as quoted by the Food and Agricultural Organization (FAO) informed that, without agricultural development, the economic base of the rural masses cannot be strengthened and without such, the ability of the local institutions to develop and maintain social overheads and infrastructures got seriously impaired and without diversification and sustained growth in agriculture, urban

areas cannot generate the requisite volume of employment. Such development largely depends on the rural areas because of their high potentials for agricultural production.

According to Sinke and Demeke (1995) roads stimulate farmers to increase production. The author further stresses that effective transport and allied activities improved the spatial organization of the people and hence improve the living standard through the implementation of the basic services of agricultural development. Olayemi (1982). Weatherspoon and Reardon (2003) reported that road transport development encourages exchange and goods travels, and change of ideas and also breakdown uniformity in the taste, health education and life expectancy.

Accessibility has been a major area of concern in the development of rural areas especially on agricultural development. As such accessibility is among the major factors inhibiting rural development in Nigeria and elsewhere in the world. It is also an area which rural communities are becoming sensitive to their economic decisions. Von Braun, *et al* (1992) argues that the level of development of any country is largely controlled by the level of investment in the transport sector of the economy. In Gambia and Senegal, the growth of groundnuts as major cash crop resulted from the investment in the transport networks (Ibid). Road transport development also influences the formerly isolated areas with other production areas both in internal and external trades. The above statement reflects the efficiency of distribution hubs which serves as incentive to increasing production.

2.3.4 Marketing and Distribution of Agricultural Commodities

Periodic markets are the most common type of markets in Nigerian towns and they serve a very useful purpose in the collection and distribution of agricultural and non-agricultural commodities (Haruna, 2010). Periodic markets serve as major centres of interchange. In towns and cities, periodic markets have a unique function. In the hinterlands they supply people with manufactured goods while in urban areas they supply agricultural products. The markets facilitate trading activities between one region and another, with transportation playing a crucial role in the process (Ibid).

The flow of agricultural commodities from Kaduna state is a vital factor in the development and expansion of its economy. The growing demand in food and other consumer goods can only be met through transportation and flow of agricultural commodities. Otitolaiye (2009) indicated that developing countries including Nigeria are undergoing quick population growth rate and urbanisation which increases the demand on the production and distribution of agricultural commodities. Agricultural marketing is progressively important because it enables regions to develop from an agricultural sector to a more industrialized economy. Haruna (2010) said that Nigeria is undergoing a teaming population growth and urban development which increase with increased demand in food supply. Putman (1991) support this fact and observes that no urban centre can be self-sustaining, because the people must be fed from farms that are near or far.

Distribution of agricultural produce, demand for commodities is indeed the foremost reason for improving transportation because it contributes in the transfer of commodities from arrears of supply to arrears of demand.

Transportation permits social interaction to take place between diverse regions. It is also responsible for the enormous part of marketing cost, thereby increasing the reselling price of urban markets. Musa (1994) emphasized the role of transportation in inter-urban movement and distribution of foodstuff in Zaria. The author described transportation as the "indispensable" in all aspect of development and the wealth of a nation is dependent on the level of its mobility. Inaccessibility, according to the author hinders effective use of natural resources.

Michael (2008) studied freight flow pattern of agricultural commodities in Giwa and Maigana markets, the study shows that Giwa market is a major bulking centre where products are brought from diverse areas of Kaduna state and then moved to closer settlements and distant places. The Maigana market on the other hand is a growing centre attracting traders from different places like Zaria Kano Jos etc. The findings of the study shows that grains are the major products of activities generated by Giwa and Maigana markets. The result also shows that while the impact of the two markets are felt within the local and national regions, that of Giwa market stretches out beyond the Nigerian boarder to countries like Niger and Chad.

CHAPTER THREE

STUDY AREA AND METHODOLOGY

3.1 INTRODUCTION

This section discusses the study area and the various methods that were employed in generating data for the study. The section explained the sources of data, the sampling design, questionnaire administration and the methods of data analysis.

3.2 STUDY AREA

This sub section discusses the study area of the research work. The location and history of the area were discussed. Further explanation of the relief and drainage, weather and climate, soil, vegetation, population and socio-economic activities, as well as the transport and communication system of the area were also discussed.

3.2.1 Historical Development

Before Sir, Lord Lugard came to Kaduna, the town had served as a trading station and a labour camp with few scattered Gbagi farm steads. In 1912 Kaduna was selected by Lord Lugard as the most strategic place for his administrative and military headquarters for the new protectorate of Northern Nigeria. In 1976, General Murtala Muhammed administration created seven new states in Nigeria. The North central state with the capital at Kaduna, was renamed Kaduna state. It was made up of two colonial provinces of Zaria and Katsina. In 1991, the numbers of states in the country were increased from twenty one to thirty. Katsina province became Katsina state while old Zaria province

became Kaduna state. There are twenty-three (23) local government areas in Kaduna state.

3.2.2 Location of the Study Area.

Kaduna State lies between latitude 9^{o} 02" and 11^{o}32" north of the equator and between longitude 6^{o} 15" and 8^{o} 50" east of the prime meridian. Kaduna state is bounded to the north by Katsina, Zamfara and Kano state to the west by Niger state, to the east by Bauchi state and to the south by Plateau state, Nasarawa and the Federal capital territory Abuja. See figure 3.1

The State has a land area of about 43,460km^2 which makes it the largest in the northwest geo-political area and has about 4.7 percent of Nigerian land area (NPC, 1998). The longest distance by road from north to south is about 290km^2 and from east to west is about 286km^2. It has three major urban areas Kaduna, Zaria, and Kafanchan, which are accessible by different classes of roads, and railway lines. The state consist of twenty three Local government areas (LGAs) with Kaduna north and Kaduna south and parts of Igabi and Chukun LGAs forming the metropolis, which is at the capital of the state.

The four distribution hubs are located in four different LGAs of Kaduna State. Saminaka distribution hub is in Lere Local Government Area. Lere LGA is bounded to the southwest by Kauru local government to the north east by Toro local government area of Bauchi State and to the southwest by Bassa local government area of Plateau state.

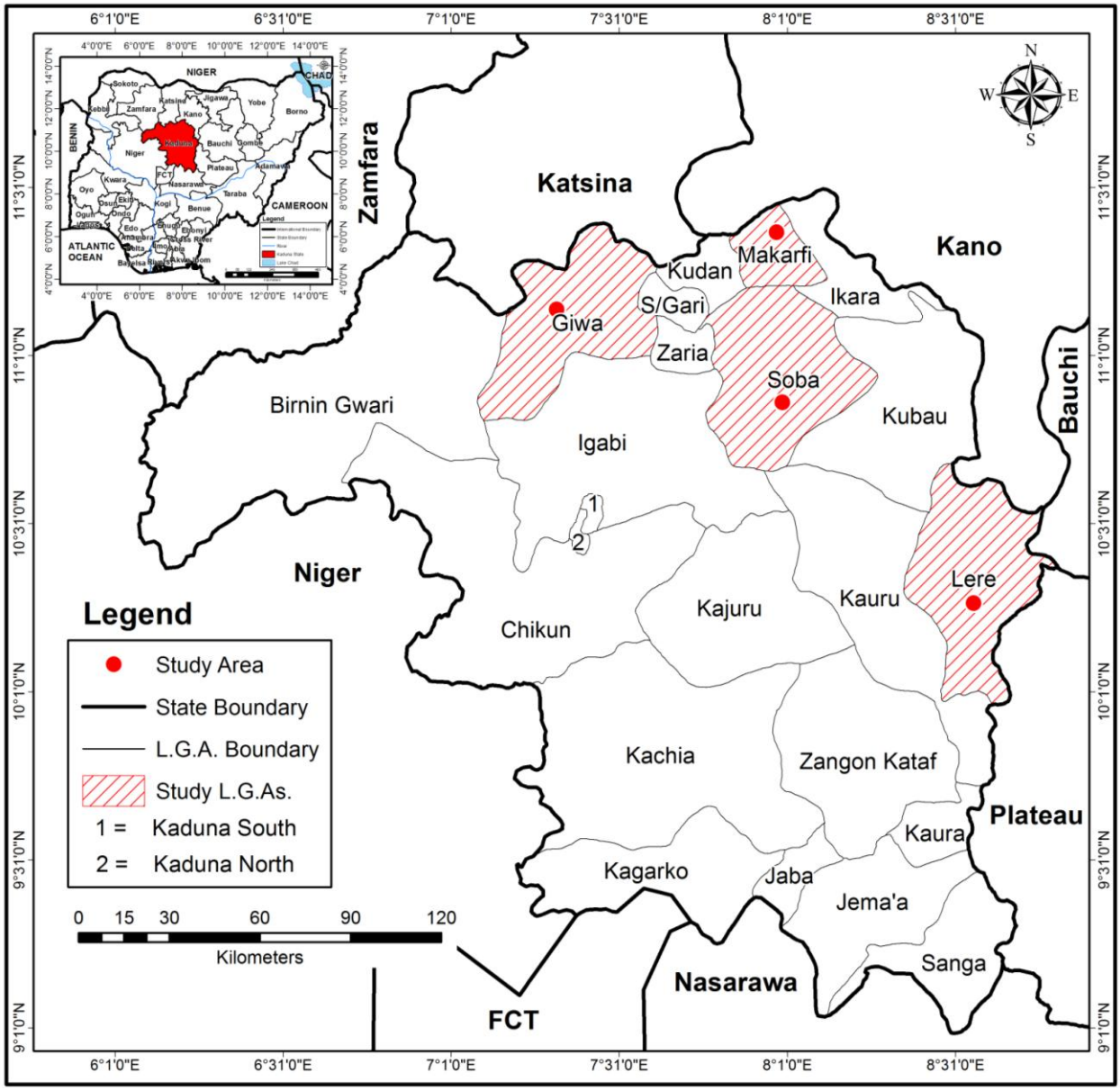


FIGURE 3 .1: KADUNA STATE SHOWING STUDY AREA
Source: Adapted and modified from the Administrative map of Kaduna State

Soba distribution hub is in Soba town of Soba Local Government Area. Soba LGA is situated in the north-eastern part of Kaduna state and share boundaries with Ikara, Makarfi and Kudan local government areas.

Giwa distribution hub is in Giwa Local Government Area. It is situated in the western part of Zaria town. It is bounded in the southwest by Birnin Gwari local government to the southwest by Igabi local government area and Faskari local government area of Katsina state to the north. Makarfi distribution hub is in Makarfi Local Government Area. It shares boundaries with Ikara, Soba and Kudan local government in Kano state in the north east. (Figure 3.1 shows the study area)

3.2.3 Relief and Drainage

Kaduna state consists of a striking range of natural environment. The topography varies from the Kudaru ring complex hills in the east to the wide valley plains of the River Kaduna in the West. The geology of the area consists of the Precambrian rocks of the basement complex. The present topography constitutes a rolling plain generally below 610 meters above sea level. This is not unconnected with the prolonged denudation of the basement complex rocks, which underlie the area. The area consists of older granite, schist and quartzite, in different composition. The land gradually slopes down towards the west and the southwest and is drained by two dominant rivers which are river Kaduna and Gurara.

The relief inwardly influences the drainage pattern, in the southern parts of the state. Most of the area lies within the Mada, Okawa and Gurara River system. The Okawa and Mada Rivers flows into the Benue, while the Gurara River flows into the Niger. There are other smaller rivers that drain the area some of which include river Gwalake, Ninack, Anvuyeh, Abari, Akwa, among others. These rivers are seasonal with

low regime during the dry season. In the Northern part of the state River Galma is the major drainage system. The Galma and its tributaries are largely seasonal in character and their flow regimes are highly irregular. The major tributaries of the Galma include kubani, Saye, Tubo and Shika Rivers (Mamman, 1994)

3.2.4 Weather and Climate

Kaduna state has a tropical continental climate with marked seasonal variation. The area is influenced by two distinct air masses that have much effect on the climate. The north easterly trade winds, which are usually dry and dusty, are pronounced between November and March. This period is referred to as harmattan. The second type is moisture laden tropical maritime air mass that originates from the Atlantic Ocean and brings rain with it. The variations in the on-set of rainfall are attributed to the fluctuations of the boundary between these two air masses.

Rainfall is heavy in the southern part of the state and reaches an average of over 500mm per month between April and September. In the extreme north the monthly average is 146mm, while Kaduna town it reaches a monthly average of about 361mm. The pattern of temperature and rainfall determine the types of crops, animals and food production. The first rain of the year usually falls with thunderstorm showers. The rain reaches its peak in August (Mamman, 1994).

The air temperature varies with season. The highest temperature is usually recorded in April while the minimum are usually recorded during the harmattan that is December-January. High evaporation during the dry season however creates water

shortage problem especially in Igabi, Giwa, Soba, Makarfi, Ikara, and Zaria local government areas.

3.2.5 Soil

The soil in most parts of Kaduna state fall under the ferruginous tropical soil. Most of the soils contains between 30-40 percent clay at a reasonable depth, because of intensive leaching. The soils in the upland areas are rich in red clay and sand but poor in organic matter, the nutrients holding capacity of these soils is not known to support intensive agriculture for long period without the application of fertilizer and or manure. Some areas have permanent water-logged soils between January and March. The plains in Kaduna state have undergone considerable changes over the years due to combined action of both physical and chemical weathering.

3.2.6 Vegetation

Kaduna state lies within the northern Guinea savannah ecological Zone. The vegetation is typically of woodland type and deciduous in character, shedding their leaves annually during the dry season in order to conserve water. The dominant tree species include *isoberline, doka, bridelis, terminalia, acacia, etc.* Grasses and shrubs are found in tussocks and the predominant family is *androgeneae*.

The southern part of the state has more rainfall, with an average of 1500-2000mm per annum, thereby giving it a more dense vegetation. However, human occupation and rapid increase in population have significant impact on the natural

vegetation. Efforts have been made by individuals and government to replace the destroyed natural vegetation with trees like mango, cashew, guava trees, and gmalina among others.

3.2.7 Population

The population of Kaduna state according to the 1991 census was 3,935,618 (4.4 percent of the national total) and with a growth rate of 3.8 per annum .The 2006 population census shows Kaduna state to be 6,066,562. Over the years, the population has been expanding especially in the urban centres**.** Young able labourers in large numbers from rural areas migrate to towns to learn specific trade or acquire special training in mason, technicians, carpentry, motor mechanics etc, during the dry season and go back to the rural agricultural fields during the wet season in the state. The concentration of government employment opportunities and infrastructures in towns' like Zaria Kaduna and Kafanchan attracts a lot of people from other parts of the country to the state.

3.2.8 Socio-Economic Activities

Most of the inhabitants of the study area are into agriculture. There are basically two systems of arable cropping. The rain fed arable cropping which is dominant in the southern part of the state. It is labour intensive and cultivation is done manually by the use of the crude implements. The major crops grown are food crops like maize, yam,

millet, cassava, cocoyam, sorghum, rice, acha, and a few cash crops like soya beans, groundnut, and ginger.

Irrigation agriculture is also practiced along flood plains and fadamas in smaller quantities. This is due to variation in seasons. Food crops such as maize, rice among others are also grown through irrigation agriculture. Vegetables such as spinach, garden egg, okro, pepper, tomatoes among others are also cultivated. Domestication of animals is also another economic activity within the area. Animals reared include cattle, pigs, goats, sheep, and chickens amongst others .The landscape of Kaduna state is dotted with several abandoned large and medium scale industrial enterprises especially in the main urban centres of Kaduna and Zaria.

Before this industrial collapse, Kaduna state then was ranked among the states in Nigeria with the highest concentration of industries. The state has a dozen of textile industries and the multi-purpose Kaduna refinery and petrochemical company (KRPC), international Breweries and Beverages industries, Peugeot Automobile of Nigeria, Nigerian Breweries Plc., Sun seed Plc oil industry in Zaria and several others. These industries have stimulated the commercial activities of the state, but most of which are now in a state of decline.

3.2.9 Transport and Communication

Kaduna state is served with about 2,820km stretch of trunk "A" Federal well surfaced roads radiating from Kaduna city in five cardinal directions. The state government has also constructed surface roads of about 1,200km and several other road

development projects are still going on. The state is also linked to railways and air transport services, thus facilitating both national and international movements in and out of the state. Also, a modern Telecommunication system connects Kaduna state with all other states and outside world. MTN, AIRTEL, ETISALAT, and GLOBACOM, and others provide telephone exchange services for the state.

3.3 METHODOLOGY

This sub section discusses the reconnaissance survey, types and sources of the data collected using both primary and secondary methods to gather information. Instrument of data collection were mainly through the use of questionnaires, sampling design and sample size as well as the methods of data analysis

3.3.1 Reconnaissance Survey

A reconnaissance survey was carried out in order to have a good knowledge of the study area. The survey helped the researcher to gain insight into the nature of the distribution hubs' capacity in handling the freight generated, types of trucks used in transporting agricultural commodities, their storage facilities, the nature of roads in the area, packing facilities, the process of unloading and loading, the volume of freight generated by each hub and the processes involve in the packaging of agricultural commodities.

3.3.2 Types of Data

In an effort to achieve a better and meaningful result for this study, the researcher made use of both secondary and primary methods to collect data/information.

3.3.3 Primary data

Primary data were obtained through questionnaires that were structurally administered to traders and transporters in the various distribution hubs. Respondents were asked about their age, sex, level of education, level of experience, the nature of the distribution hubs, capacity of freight generated, their storage facilities, the nature of roads in the area, packing facilities, types of trucks used, the process of unloading and loading, the volume of freight generated by each hub and the processes involve in the packaging of agricultural commodities, while direct interviews were conducted for respondents that were not literate.

3.3.4 Secondary data

The administrative map of Kaduna State indicating the four local government areas where the distribution hubs are located formed an important source of information. Apart from maps, Secondary data were sourced through the use of documented materials such as journals, existing transportation and freight distribution studies, textbooks, proceeding of seminars and through other research findings.

The major instrument used for the collection of data was through the use of questionnaires alongside interview and observations. Questionnaires were distributed to the traders and transporters of the various distribution hubs. The questionnaire was divided into two sections. Section A was designed to elicit information from the respondents about their socio economic characteristics while section B dealt with various transportation and agricultural issues pertaining to the research objectives.

3.3.5 Sampling Design and Sample Size

From the reconnaissance survey carried out by the researcher in the four distribution hubs, data available show that a total number of 26 trucks and 40 canters were loaded per day from Saminaka,17 trucks and 10 canters from Soba, 23 trucks and 20 canters from Giwa while 34 trucks and 51 canters were loaded from Makarfi. The research was carried out for a period of four (4) market days. Similarly, data available from the government revenue collection offices in the various distribution hubs shows that the traders are more than the numbers available but the number on record only show the ones that pay tax. Saminaka has an average of 120 traders, Giwa has 110 traders, and Soba have 100 traders while Makarfi is also averaging at 120 traders. Systematic sampling technique was adopted in selecting these target population on the basis of which 20% of the transporters were selected for four days while 40% of the traders were sampled on the same number of days (See table 3.1 & 3.2). This brings the total at 176 copies of questionnaire for the transporters and 180 copies for the traders. In all, a total

number of 356 copies of questionnaire were administered to the respondents out which 345 copies were returned completed representing a success rate of 96.91%.

Table 3.1: Sample Population of Transporters

Distribution Hubs	Estimated number of trucks loaded per market day	20% of the population sampled	20% multiplied by four market days	Estimated number of canters loaded per market day	20% of the population sampled	20% multiplied by four market days
Saminaka	26	5.2	21	40	8	32
Soba	17	3.4	14	10	2	8
Giwa	23	4.6	18	20	4	16
Makarfi	34	6.8	27	51	10.2	41
Total			**80**			**96**

Source: Author's Field Survey,(2014)

The researcher categorised the traders into the following groups:

a. Grain traders, (maize, rice, soya beans, sorghum, beans)

b. Vegetable traders, (pepper, carrots, tomatoes, onions).

c. Livestock traders, (cattle, sheep, goats, fowls)

d. Tuber crop traders, (yams, potatoes, cassava).

Table 3.2: Sample population of traders

Distribution Hubs	Number of Traders	40% of Traders Sampled
Saminaka	120	48
Giwa	110	44
Soba	100	40
Makarfi	120	48
Total	**450**	**180**

Source: Author's Field Survey,(2014)

3.3.7 Method of Data Analysis

The information and data obtained on the field through the use of questionnaires, interviews and documented materials were subjected to various descriptive statistical tools. The analysis of demographic and socio-economic characteristics of the respondents carried out from the data collected from the questionnaires were based on simple statistics supported by series of tables and figures showing percentage calculations of some variables. All data were coded into the Statistical Package for Social Sciences SPSS 19.0 Version.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 INTRODUCTION

Data collected from the field was analysed and discussed in this chapter, using descriptive and inferential statistics tools. The descriptive statistics include tables, frequencies, percentages, and bar charts showing some variables. The section present the results of analysis carried out on data collected from both the transporters and traders of the various distribution hubs namely Saminaka, Soba, Makarfi, and Giwa.

4.2 DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS OF TRANSPORTERS

This sub section examines the socio-economic characteristics of transporters which include information about their sex, age, and marital status, level of education; driving and general issues pertaining to agricultural transportation and distribution were examined here.

4.2.1 Sex Distribution of Transporters

The sex distribution of any population has a noteworthy effect in any research. It determines to a greater extent the human power supply in the transportation and distribution of agricultural commodities. The field survey shows that the sex distribution shown in Table 4.1 indicates that all the respondents surveyed were males. This perhaps might not be unconnected with the fact that men are more involved in transportation

business and coupled with the nature of the study area where it is uncultural for women to drive public transport vehicles.

Table 4.1: Sex Distribution of Transporters

Sex	Number of respondents	Percentage
Male	165	100
Female	0	0
Total	**165**	**100**

Source: Author's field survey, 2014

4.2.2 Age Distribution of Transporters

Age of workers play a significant role in the transport and distribution system. It could be inferred from Table 4.2 that the majority of the respondents are between ages 20-34 accounts for half of the respondents. These are the most active age groups who are very energetic and engage in the transportation of agricultural commodities as a means of livelihood.

Table 4.2: Age distribution of transporters

Age (in years)	Number of respondents	Percentage
20-24	24	19.5
25-29	28	17.5
30-34	24	14.5
35-39	21	12.7
40-44	13	7.9
45-49	22	13.3
50-54	24	14.5
55-90	9	5.5
Total	**165**	**100**

Source: Author's field survey,(2014)

4.2.3 Marital status of the transporters

Marital status plays a key role in the marketing, transportation and distribution of agricultural produce. It indicates the level of responsibility and maturity to profession. This is because married people in our society tend to control some level of respect and dignity. Analysis of Table 4.3 indicates that 131 of the respondents representing more than two third are married while 34 respondents representing less than one third are single. It is obvious the married people are involved in transportation of agricultural freight than those that are not married. This is in agreement with Dogonyaro (2008) who studied the physical distribution pattern of agricultural commodities in Kasuwan Magani Market also reported that married people participate more in the transportation and distribution of agricultural commodities compared with their unmarried counterparts.

Table 4.3: Marital Status of Transporters

Marital status	Number of respondents	Percentage
Married	131	79.4
Single	34	20.6
Total	**165**	**100**

Source: Author's field survey,(2014)

4.2.4 Educational Level of the Transporters

The literacy level of the respondent is gradually rising generally based on the data obtained on the field. It shows that a large proportion of the respondents have one form of education or another, either non formal (knowing how to read and write in Arabic or formal (primary, secondary or post-secondary education.)

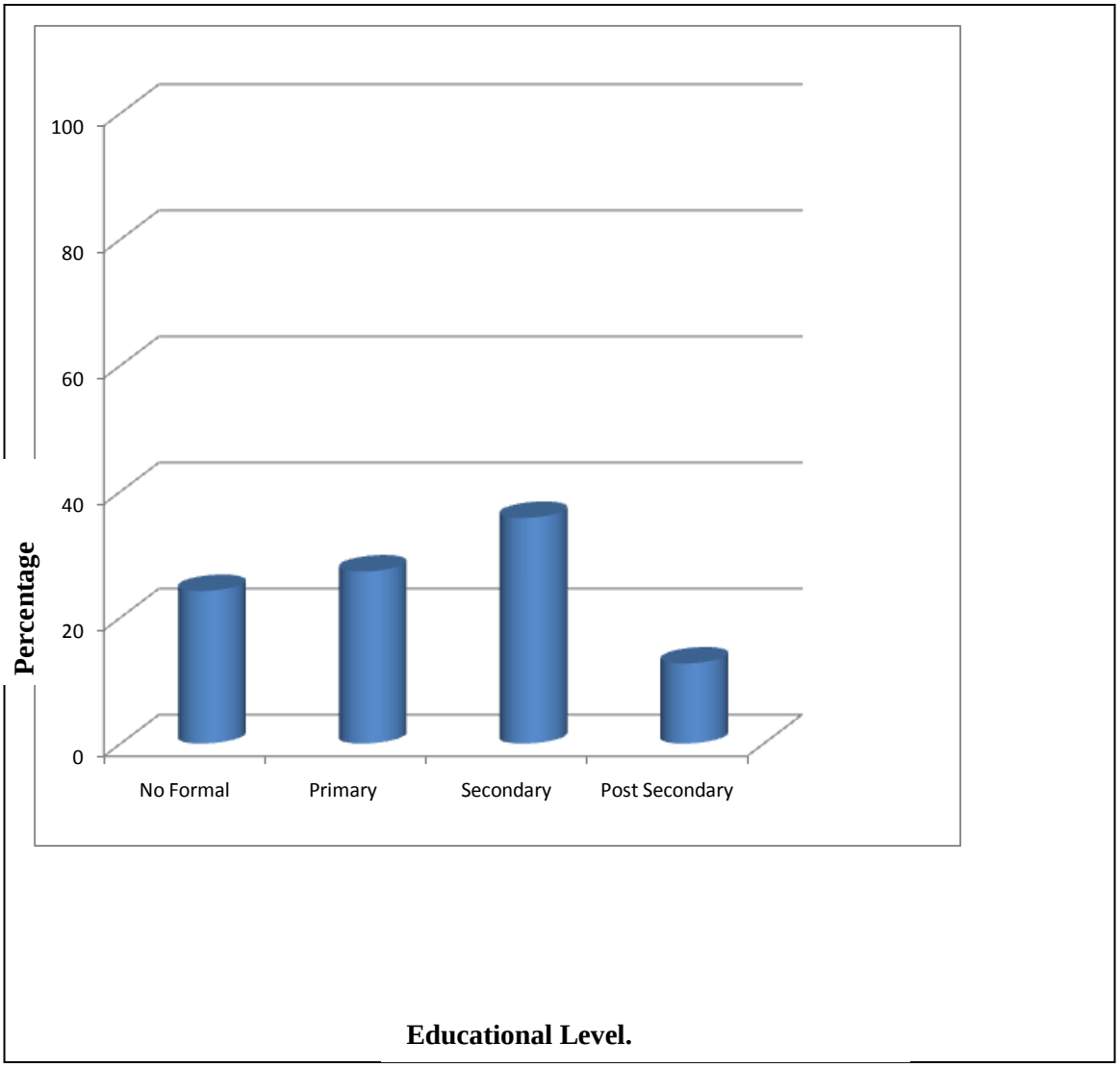


Figure 4.1: Educational Level of Transporters
Source; Author's field survey (2014)

Analysis of Figure 4.1 shows that less than one quarter of the respondents had no formal education, and more than one quarter of the respondents had primary education, while 35.8 percent of the respondents indicated secondary education. This is in agreement with the findings of Haruna (2011) who reports that most people involved in the transfer

of agricultural commodities from Zaria region have acquired a form of western education.

4.2.5 Level of Driving Experience of Transporters

The level of driving experience also play a significant role in the safety operation of the trucks, goods and other road users. Table 4.4 reveals that drivers with 5-9 years have the highest percentage of less than one third of the respondents, drivers that have experience of less than 5 years indicated less than one quarter. However, the overall percentage of more than three quarter for those driving above 5 years shows that most of the drivers are experienced. The level of experience of any driver no doubt play a significant role in proper operation and handling of the vehicle as this can significantly reduce the level of accidents amongst the respondents sampled. This may be because this level of experience makes them either to easily or not easily abide by most of the traffic rules and regulations while giving considerations to other road users.

Table 4.4: Years of Driving Experience of Respondents

Years of Driving	Number of respondents	Percentage
<5	20	12.1
5-9	52	31.5
10-14	29	17.6
15-19	36	21.6
> 20	28	17.6
Total	**165**	**100**

Source: Author's field survey,(2014)

4.2.6 Agricultural Freight Truck Ownership

Freight transportation is an important aspect of distribution system because it enhances the movement of goods over long distances and to various geographical regions. However, agricultural freight truck ownership continues to be a problem for intending private owners because of the capital intensive nature of the transport vehicle used in conveying agricultural commodities as a result of the nature of the product.

Table 4.5: Percentage Distribution of Types of Truck Ownership

Type of Ownership	Number of Respondent	Percentage
Privately owned	133	80.6
Independent transport owner	32	19.4
Total	**165**	**100**

Source: Author's field survey,(2014)

It is obvious from Table 4.5 that privately owned vehicles are used mostly in the transportation of agricultural commodities in the four distribution hubs with 133 respondents representing more than three quarter indicate that their vehicles are personally owned. Independent transport owners had 32 respondents representing less than a quarter. This suggests that most of the vehicles used in the transportation and distribution of agricultural products in the study area are owned by private individuals. Table 4.6 shows the types of vehicles used in the transportation and distribution of agricultural commodities from the four distribution hubs. The results reveal that more than half of the respondents use canters while more than one third of the respondents use

heavy trucks. The heavy trucks have the capacity of carrying about 300 bags of 100kg equivalent of 30 tons of grains while the canters can carry about 100 bags of 100kg equivalent of 10 tons of grains. The study reveals that the heavy trucks are mostly involved in long distance haulage travel especially states like Lagos, Port-Harcourt. Maiduguri etc. while the canters, Buses and Pickup Vans transport agricultural commodities to neighbouring states like Kano, Abuja, Lafia, and Katsina etc.

Table 4.6: Percentage Distribution of Types of Vehicle use

Mode	Number of Respondents	Percentage
Heavy trucks	69	41.8
Canters	96	58.2
Total	**165**	**100**

Source: Author's Field Survey, (2014)

Plate 1 and 11 are some of modes of Transportation use by the respondents in the study area.



Plate I; A Canter



Plate II; A Heavy Truck

Source: Author Field Survey (2014)

4.2.7 Types and Capacity of Freight Trucks Used in Transportation and Distribution of Agricultural Produce from Kaduna State.

The type and capacity of freight trucks use in the transportation and distribution of agro-based produce determine the amount of goods it can carry. This finding reveals that different brand of trucks and canters are used in the transportation and distribution of agricultural produce with the Netherlands product ***Daf*** topping the list, followed by the German products ***Mercedes*** and the Chinese product ***Howo.*** All these heavy trucks have the capacity of carrying 300 bags of 100kg equivalent of 30 tons of all forms of grains while the Swedish and Italian products ***Volvo*** and ***Iveco*** have the lowest number of trucks.

On the list of the canters the Japanese product of ***Mitsubishi*** topped the list followed by the United State product ***Ford*** and the Japanese made product ***Toyota***, while others are Mazda and Peugeot of Japan and Germany.

Table 4.7: Percentage distribution of the types of freight trucks used

Brand of heavy trucks	Number of respondents	Percentage
Daf	26	15.8
Howo	10	6.1
Iveco	4	2.4
Mark	7	4.2
Man	6	3.6
Mercedes	12	7.3
Volvo	5	3.0

Source: Author's Field Survey,(2014)

The canter vehicle has varying carrying capacity of 100 bags of 100kg equivalent of 10 tons of grains while other types can carry between 50 and 60 bags equivalent of 5 and 6 tons of 100kg of grains.

Brand of canters	Number of respondent	Percentage
Mitsubishi	27	16.3
Ford	23	13.9
Mazda	13	7.9
Peugeot	13	7.9
Toyota	19	11.5
Total	**165**	**100**

Source: Author's Field Survey,(2014)

The result shown in Table 4.7 shows that most of the transporters use canters to transport agricultural commodities in the four distribution hubs sampled, 27 respondents representing less than one quarter use Mitsubishi, 26 respondents signifying less than one quarter use Daf and 23 respondents indicating less than one quarter use Ford. These findings suggest that these brands of vehicles are durable and can cope with the nature of our roads, and are easy to maintain.

4.2.8 Type and Nature of Agricultural Commodities Transported from Kaduna State

Figure 4.2 shows the type of agricultural commodities transported by transporters from the four distribution hubs. These agricultural commodities are transported using different brands of vehicles to different destinations within and outside Nigeria. The results shows that 161 respondents signifying more than half transports grains, while less than one quarter transports vegetable crops, less than one quarter transports livestock, and 23 respondents representing less than one quarter transports tuber crops.

The findings, clearly reveals that grains such as maize, rice, sorghum, millet, soya beans are the main agricultural commodities that are produced in the study area and distributed to different part of the country and outside the country. This is closely followed by vegetable crops such as onions, pepper, and tomatoes. Further findings from the study area reveal that the grain production might not be unconnected with the weather condition which is favourable for the cultivation of grains and the availability of irrigation system.

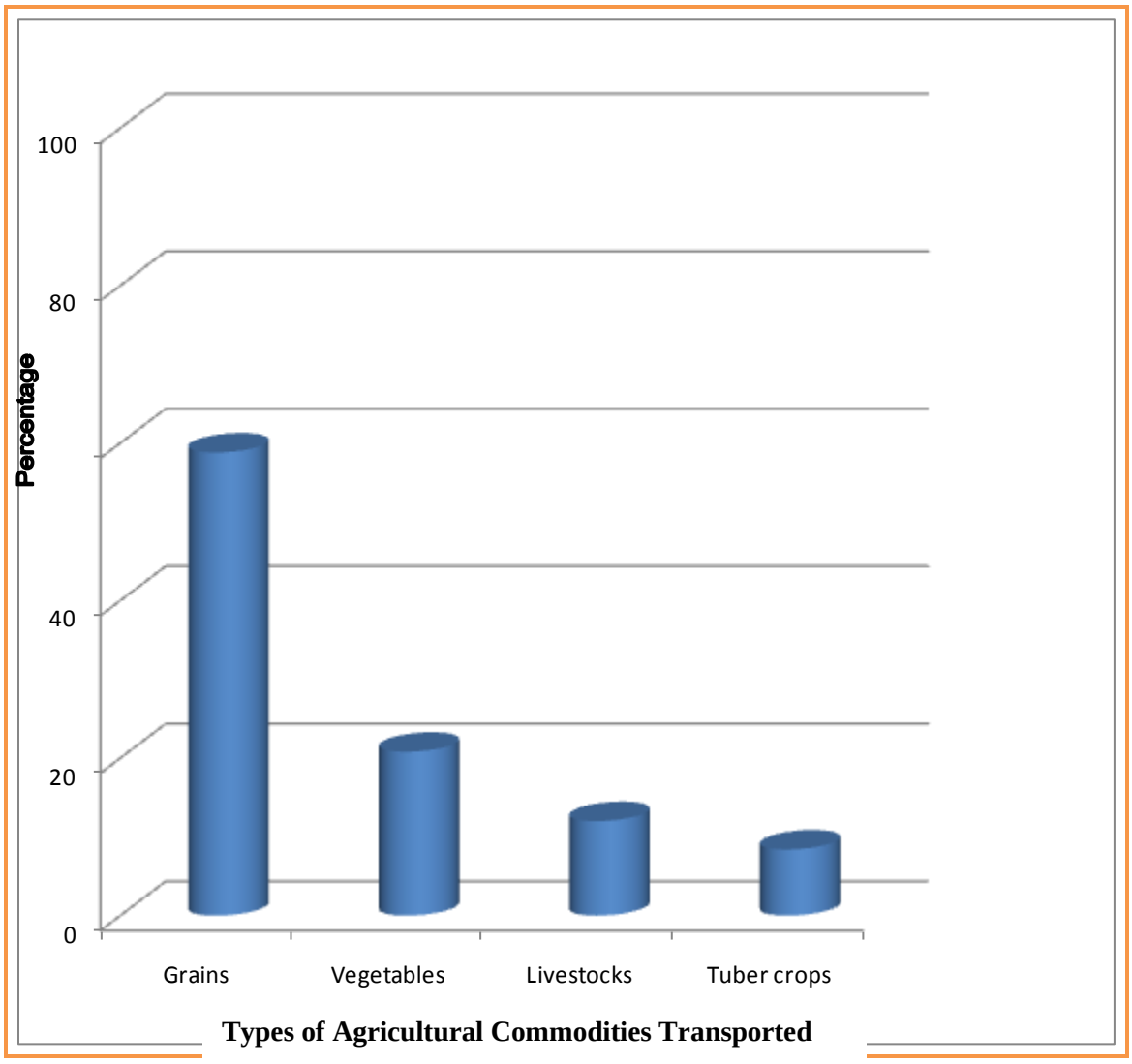


Figure 4.2: Distribution of the Types of Agricultural Commodities

Source; Author's Field Survey (2014)

Plate 111,1V,V, and V1 Shows the Types of Agricultural Commodities Transported from the study area.



Plate III; Onions Ready for Packaging at Makarfi distribution Hub



Plate IV; Packaged Bags of Onions at Makarfi Distribution Hub



Plate V; Goats at Soba Distribution Hub



Plate VI; Stack of Grains at Saminaka Distribution Hub
Source: Author's Field Survey (2014)

Analysis shown in Table 4.8 indicates that Makarfi distribution hub attracts more transporters than the other distribution hubs which is highest at 63 respondent representing more than one third. This is followed by Saminaka distribution hub with 50 respondents representing less than one third. The result suggest that Makarfi and Saminaka distribution hubs are large bulking points of agricultural commodities in Kaduna state, while Giwa and Soba is lowest with less than a quarter each. Makarfi distribution hub attracts more transporters than the other distribution hubs which is highest with 63 respondent representing more than one third of the population.

Table 4.8: Percentage Distribution of Various Agricultural Loading Hubs

Name of hub	Number of respondents	Percentage
Saminaka	50	30.3
Makarfi	63	38.8
Giwa	32	19.4
Soba	20	11.5
Total	**165**	**100**

Source: Author's field survey, (2014)

Plate V11, V111, 1X and X. Show the Loading of different types of Agricultural Commodities from the study area.



Plate VII; Loading Grains at Soba Distribution Hub



Plate VIII; Loading of Grains on an Open Truck at Giwa Distribution Hub



Plate IX; Truck being loaded with Rice at Saminaka Distribution Hub



Plate X; Truck being loaded with Soya Beans at Saminaka Distribution Hub

Source: Author Field Survey (2014)

4.2.9 Sphere of Influence of the Four Distribution Hubs

Makarfi distribution hub is located in Makarfi town, the headquaters of Makarfi Local Government along Kudan/Hunkuyi, Zaria road and it holds on Wednesday and Friday of everyweek. Makarfi distribution market/hub is a large collection center of many agro based commodities from the neighboring local governemnts of Hunkuyi, Ikara as well as Doguwa Local Government Area of Kano state. It is patronized by traders from different part of the country. Major agricultural commodities that are handled by the hub incude grains especially maize, rice, sorghum, soyabeans, millet, beans and groundnuts Others include dried pepper, onions and sugarcane.

The findings of this study reveals that Makarfi distribution hub is the largest collection centre of dried pepper and onions in Kaduna state. The pepper is transported to Porthacourt, Ile-ife and Enugu while the onions are transported to Akure and many parts of sourthern Nigeria.Agricultural produce are generated into the distribution hub by different mode raging from motocycles, buses, pick up vans and wheelbarrows. Distribution of agricultural commodities is mostly done by heavy trucks and canters for various distributions in Nigeria and the neighbouring countries. Plate X1,X11,X111,and 1VX. Show the Parckeging and Loading 0f Agricultural Commodities from the study area



Plate XI; Packaging of Pepper at Makarfi Distribution Hub



Plate XII; Stack of Pepper at Makarfi Distribution Hub



Plate XII1; Loading of Pepper at Makarfi Distribution Hub



Plate XIV; Trucks loaded with Pepper at Makarfi Distribution Hub

Source: Author Field Survey (2014)

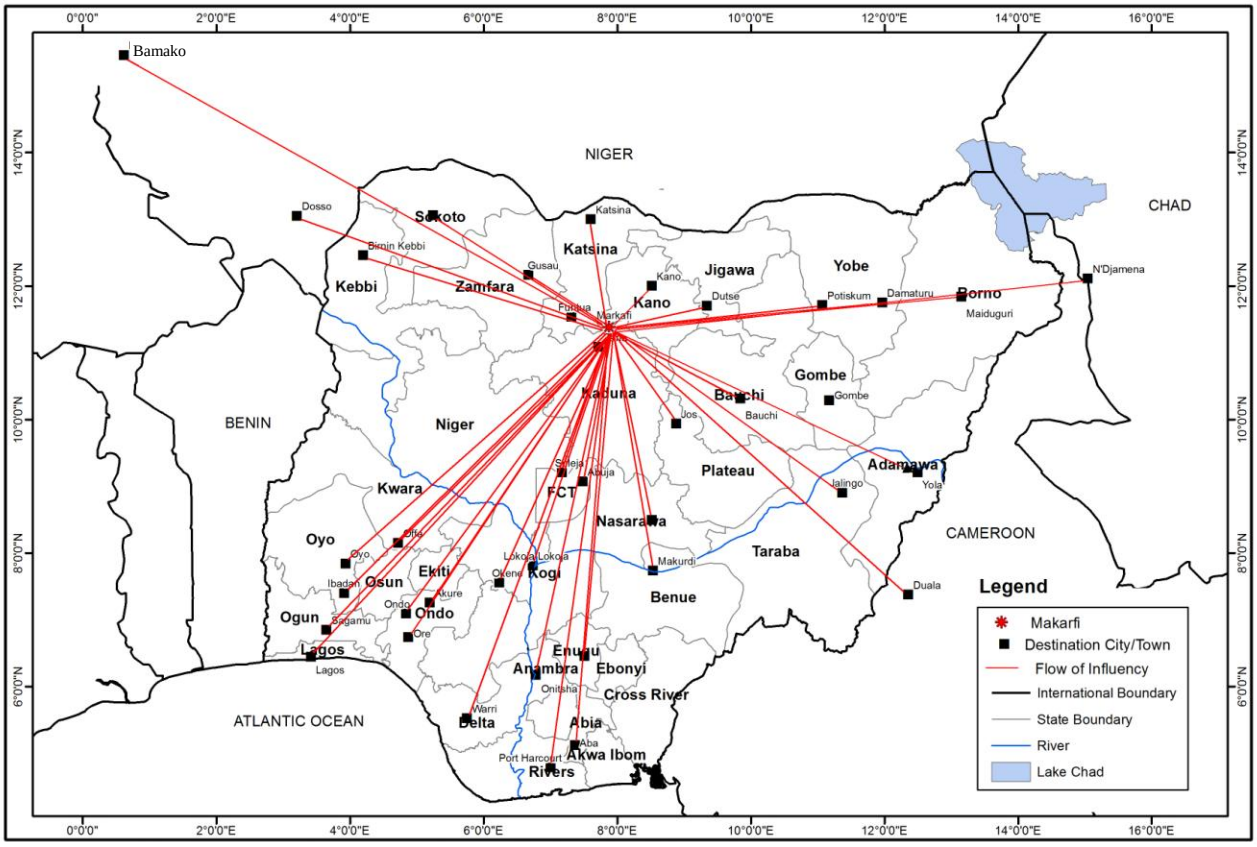


Figure 4.3: Sphere of Influence of Makarfi Distribution Hub

Source: Author's Field Survey, (2014)

Saminaka distribution hub is located in Saminaka town the headquaters of Lere Local Government area along Jos-Kaduna road. It holds every Wednesday. Saminaka distribution hub is a large collection centre of many agricultural produce from neighbouring Bassa Local Government of Plateau state, Doguwa local government of Kano state, Kauru and Kubau Local Governments of Kaduna state. It is patronised by traders from different part of the country. Saminaka distribution hub handles large quantities of agricultural produce especially maize. The inhabitants of Saminaka and its

environs are well known in the production of maize. Hence it is tagged the food basket of Kaduna state.

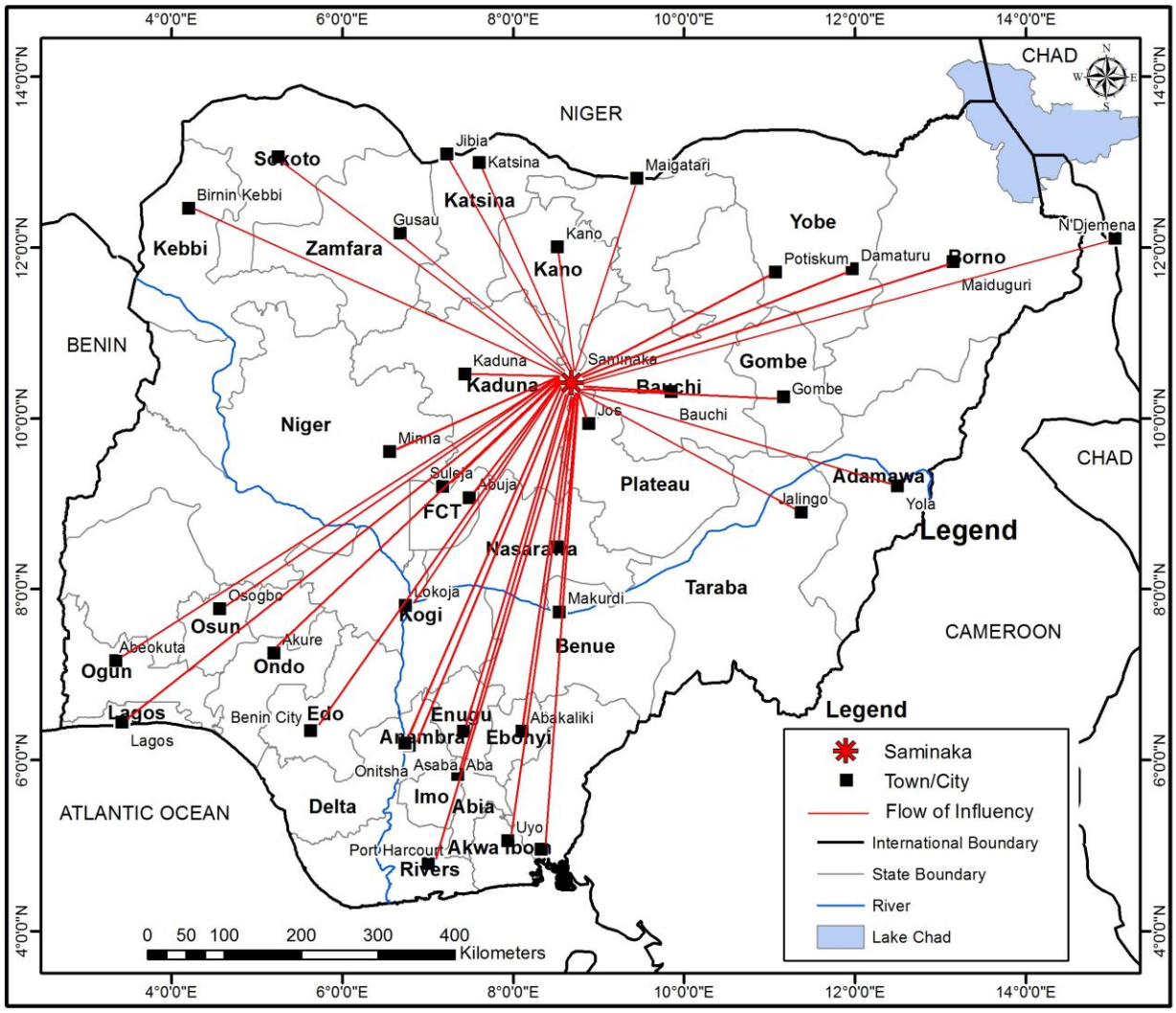


Figure 4.4: Sphere of Influence of Saminaka Distribution Hub

Source: Author's Field Survey,(2014)

Other agricultural produce include rice, groundnuts, soya beans, beans, pepper, millet, sorghum, yam, cassava, cattle etc. These agricultural produce are generated into the distribution hub using buses, pickup vans, motocycles and wheelbarrows. Heavy trucks and conters are used in the transportation and distribution of these agro-based commodities to various destination.

Soba distribution hub is located in Soba town along Jos-Zaria road. It holds every Saturday and Wednesday. Soba distrubution hub does not handle much agricultural commodities because the Local Government shares another distribution hub at Maigana town. The distribution hub is patronized by traders mostly from Soba town who purchase agricultural commodities especially maize and guinea corn and store, but later sell it to factories in Kaduna Jos Kano Lagos who use it as raw materials for the production of flour, semovita etc. Other agricultural produce include soya beans, rice, millet, fresh tomatoes, cassava, yam and animals such as sheeps, goats and fowls.

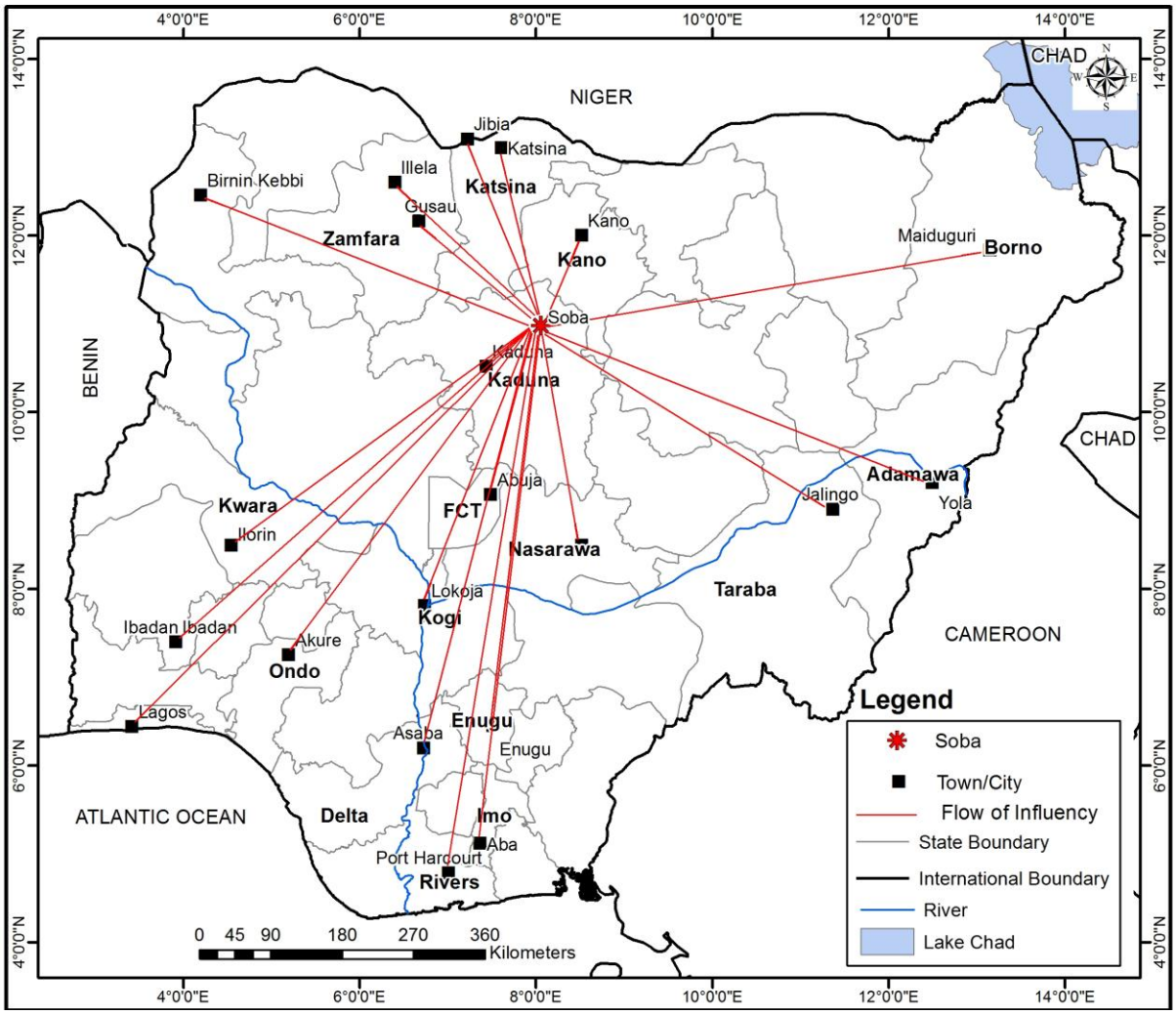


Figure 4.5: Sphere of Influence of Soba Distribution Hub

Source: Author's Field Survey,(2014)

Giwa distribution hub is located in Giwa town along Funtua-Zaria road. It holds every Thursday and Sunday. It is patronized by traders from different parts of the country. The distribution hub is large and handles large flow of agricultural produce from the neighbouring Zaria, Birnin Gwari, Igabi and also Funtua Local Government of Katsina state.

Major agricultural commodities handled by Giwa distribution hub include grains such as maize, rice, sorghum, soya beans, beans and a wide range of animals such as cattle, sheep, goats and fowls. Others include dried pepper and tomatoes. Agricultural produce are generated in to the hub using modes like motorcycles, buses, pick up vans and wheel barrows. The transportation and distribution of agricultural commodities is mostly done by buses to various destinations in Nigeria.

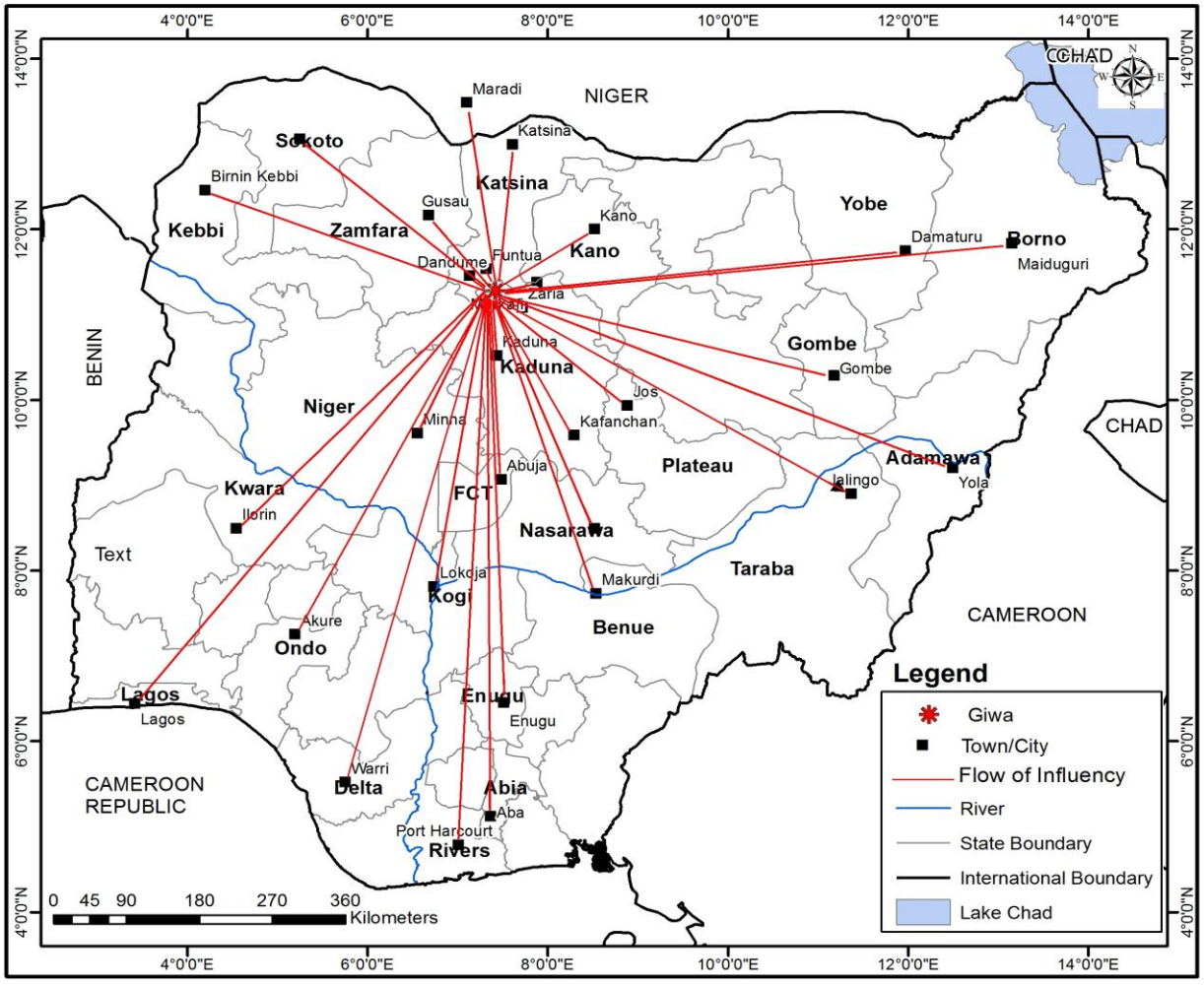


Figure 4.6: Sphere of Influence of Giwa Distribution Hub
Source: Author's Field Survey,(2014)

Figure 4.3, 4.4, 4.5 and 4.6 show the directional flow of agricultural commodities from Kaduna state to towns within Kaduna state, outside Kaduna state and the neighboring countries. This pattern of flow represents the freight distribution network strategy referred to as "Hub and Spoke Model". (Starkey, 2007) The hub and Spoke model is a system of connections which are arranged in the form of a wheel, within which all traffic flow along spokes (routes) connected to a central hub. A distribution hub is described as a key location at which various routes and means of transport converge and diverge. A simple hub model can be shown with a central hub linked by spokes converging inward and radiating outward.

The routes and means of transport that constitute the spokes of the system is shown in Figure 4.7. This is however an oversimplified model of eight unconnected points linked to a central hub by spokes along which flow occur. In reality transport and distribution hub system are more complex than the simplified model in Figure 4.7,(a) This is because relationship exists between the nodes (points). Furthermore, the transport system consists of hierarchies of hubs. Thus, the hubs of a local transport system will be part of a larger network. On the other hand, the peripheral nodes may serve as hubs for smaller networks. Figure 4.7,(b). In addition direct relationship may exist between the nodes without passing through the hubs Figure 4.7,(c) (Starkey, 2007)

Agricultural produce from the study area are transported from the surrounding villages to the main distribution hubs. On the other hand traders from different parts of the country buy transport and distribute to larger regional towns which has large catchment areas. The catchment areas of the regional towns will cover smaller

distribution hubs which comprise of various smaller hubs enclosing their own catchment areas. Figure, 4.7.

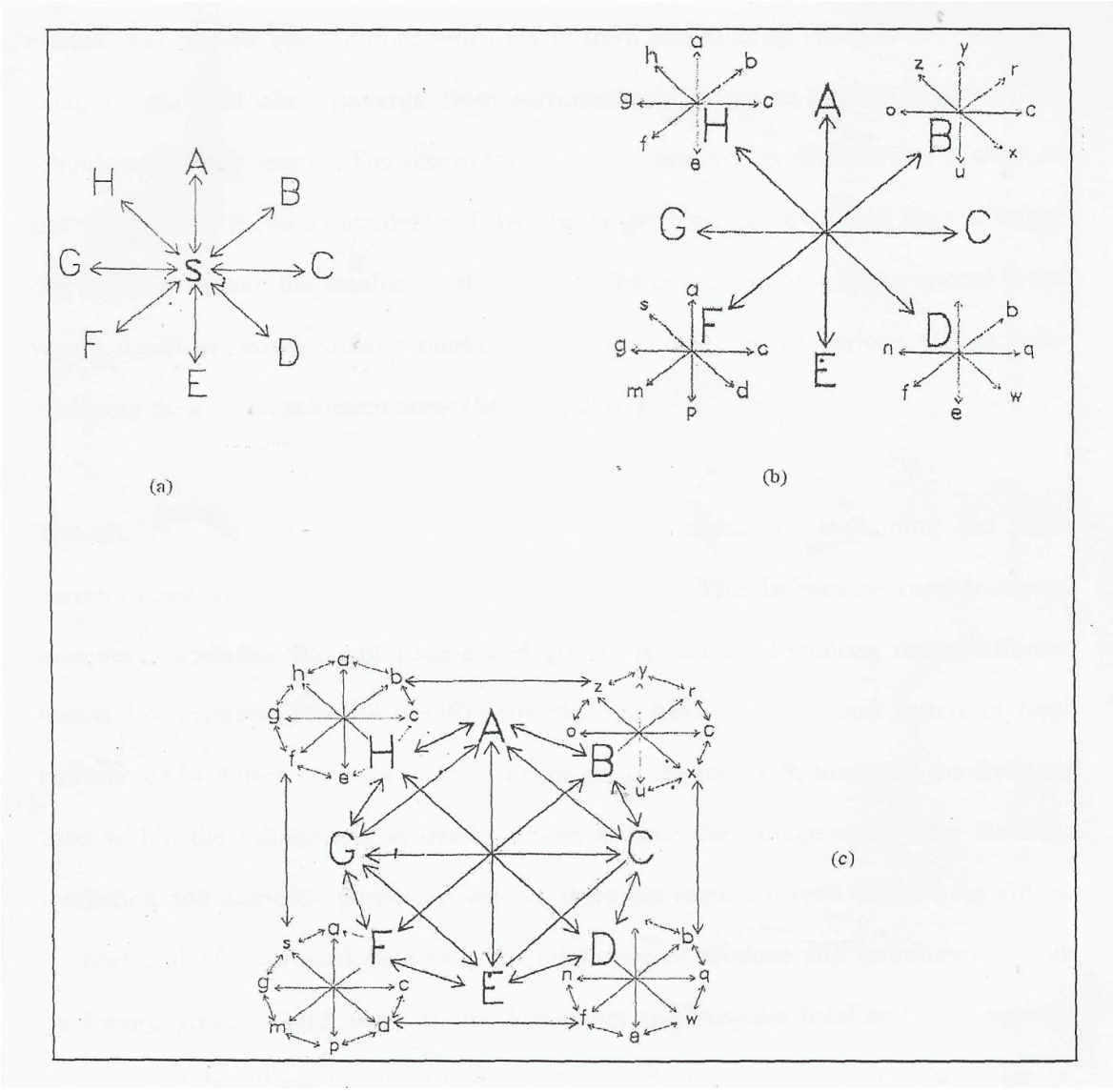


Figure 4.7: Model of a Transport Distribution Hub System.
Source: Starkey,(2007.)

4.2.10 Frequency of Transporting Agricultural Commodities to Various Destination

It can be observed from Table 4.9 that more than half of the respondents load agricultural commodities twice in a week in the study area while more than one third loads once in a week. This suggests that most of the transporters load their freight twice a week as it represents the periodicity of the four distribution hub when commercial activity strives.

Table 4.9: The Number of Times Transporters Load Agricultural Commodities from the Study Area.

No of times	No of respondents	Percentage
Once	62	37.6
Twice	99	60.0
Trice	3	1.8
Four times	1	6
Total	**165**	**100**

Source: Author's field survey,(2014)

It could be inferred from table 4.10 that almost three quarter of the respondents prefer to travel in the day time, while more one quarter of the transporters move at night. The implication of this finding is that most of the transporters move in the day time for safety reasons.

Table 4.10: Time of the Day the Transporters Move

Time	Number of respondents	Percentage
Day	119	72.1
Night	46	27.9
Total	**165**	**100**

Source: Author's field survey, (2014)

Analysis of Table 4.11 shows that most of the transporters do not use any form of stimulants to keep them awake while travelling indicating almost three quarter of respondents while more than one quarter use stimulants to keep them awake. This is in agreement with the findings of Table 4.10 shows that most of the transporters prefer to travel in the day time because it is safer.

Table 4.11: Distribution of the Use of Stimulants

Responses	Number of respondents	Percentage
Yes	119	72.1
No	46	27.9
Total	**165**	**100**

Source: Author's field survey,(2014)

Analysis of the respondents' response on table.4.12 shows that most of the transporters did not attend any form of driving school. The result reveals that almost three quarter of the respondents did not attend any driving school while more than one quarter of the respondents attended driving school. This may suggest that some of the

transporters inherited the transport driving business from their superiors over a period of time as they learn the skills of moving around various destinations over the years of interactions with their superiors.

Table 4.12: Distribution on the Attendance of Driving School

Response	Number of respondents	Percentage
Yes	44	26.7
No	121	73.3
Total	**165**	**100**

Source: Author's field survey, (2014)

4.2.11 Problems of Inter-regional Freight Transportation of a Agricultural Commodities in the Study Area.

In the process of distributing agricultural commodities, problems are ecountered on daily basis. Ubogu (2010) explained that these constraints are problems commonly cited in literature. Some of the problems identified by this study as affecting the distribution of agricultural commodities are: accident, harassment by law enforcement agents, armed robbery attacks, bad roads, fuel shortage, spare part shortage, pilferage and traffic delays. Analysis of Table 4.13 indicates that the major logistical problem faced by transporters in the distribution of agricultural commodities from the four distribution hubs are harassment by law enforcement agents indicating more than one quarter of the respondents followed by armed robbery attack and accidents indicating less than one quarter each. Law enforcement agencies play a significant role in the flow of agricultural

commodities especially incessant road check points that cause delay to goods and people on transit.

Table 4.13: Distribution of the Level of Problems Identified

Problems	No of respondents	Percentage
Accident	21	12.73
Harassment by law enforcement agents	47	28.48
Armed robbery attacks	36	21.82
Bad roads	17	10.30
Fuel shortage	13	7.88
Spare part shortage	10	6.06
Pilferage	5	3.03
Traffic delays	16	9.70
Total	**165**	**100**

Source: Author's field survey, (2014)

The result presented in Table 4.14 shows that the Federal Road Safety Corps (FRSC) causes more problem during the flow of agricultural commodities for the respondents with about more than one third of them indicating to it. These problems include non-adherence to road traffic rules and regulation, lack of driving particulars, high charges which must be paid to the bank, delay at check points and extortion of money and goods.

It is closely followed by the police with more than one quarter of the respondents signifying that they cause problems such as unnecessary extortion and harassment. Vehicle Inspection Officer (VIO's) also cause problem in the transportation of agricultural commodities with less than one quarter of the respondents in agreement. These results agrees with the findings of table 4.12 which shows that most of the transporters did not attend any driving school and this is also in agreement with the findings of Ubogu (2010) who reported that traffic delays, frequent road check point, accident, pilferage, armed robbery attacks are some of the problems facing goods transported using unimodal transport system.

Table 4.14: Distribution of Institutions that Causes Problem in the Transportation of Agricultural Commodities

Agencies	Number of respondents	Percentage
Police	48	29.09
V I O	41	24.85
FRSC	60	36.36
NURTW (union)	16	9.70
Total	**165**	**100**

Source: Author's field survey,(2014)

4.3 Demographic and Socio-economic Characteristics of Traders

This sub section examines the socio-economic characteristics of traders which include information about their sex, age, and marital status, level of education, trading

and general issues pertaining agricultural transportation and distribution were examined here.

4.3.1 Sex Distribution of Traders

Analysis of Table 4.15 shows the sex of the traders who are involve in the marketing of agricultural commodities in the study area. It was found that almost all the traders are men, while less than one quarter are women. This has been confirmed by the findings of (Musa, 2003; Michael, 2008; Oni, *et al*., 2009; Umar, 2011). This may not be far-fetched from the socio-cultural and religious belief of the people where women are encouraged to stay at home as house wives especially in the case of Hausa and Fulani dominated areas.

Table 4.15: Sex composition of traders

Sex	Number of respondents	Percentage
Male	166	92.2
Female	14	7.8
Total	**180**	**100**

Source: Author's field survey, (2014)

4.3.2 Age Distribution of Traders

Analysis of table 4.16 shows that less than one quarter of the respondents are between the ages of between 50-54 years, while 2 respondents representing less than one quarter are below the age of 20years. This shows that both the youth and the old are into

marketing of agricultural produce in the study area. This might be connected with the profit or gains made in the trading activities.

Table 4.16: Age Distribution of Traders

Age range	Number of respondents	Percentage
<20	2	1.1
20-24	18	10.0
25-29	22	12.2
30-34	28	15.6
35-39	11	6.1
40-44	25	13.9
45-49	19	10.6
50-54	37	20.6
55-90	18	10.0
Total	**180**	**100**

Source: Author's field survey, (2014)

4.3.3 Marital Status of Traders

The marital status of any population study explains the level of maturity of the sampled respondents. Marital status also determines to some extent the level of maturity as it is a general belief that married people tend to be more serious. Analysis of Table 4.17 reveals that more than three quarter of the traders indicate that they are married while less than one quarter are not married. This shows that married people are more compared to those not yet married.

Table 4.17: Marital Status of Traders

Marital status	Number of respondents	Percentage
Married	167	86.2
Single	23	12.8
Total	**180**	**100**

Source: Author's field survey, (2014)

4.3.4 Educational Level of the Traders

The description on figure 4.8 depicts the percentage distribution of the level of educational attaintment by the respondents. It shows that there has been a great improvement in the educational background of those managing the agric business. Figure 4.8 is graphical representations of data on education of the respondents with senior school certificate examination (SSCE) constituting more than one third of the respondents. Those with no formal education also constitute more than one third the respondents. Those with tertiary and primary education constitute 13.3 percent and 12.2 percent respectively. Most of the respondents with formal education are males, this could be due to the traditional belief of the people in the study area where males are encouraged to go to school more than women who stay at home. This shows the effectiveness of the traders because most of them can read, speak and write English, thus improving communication and human relations

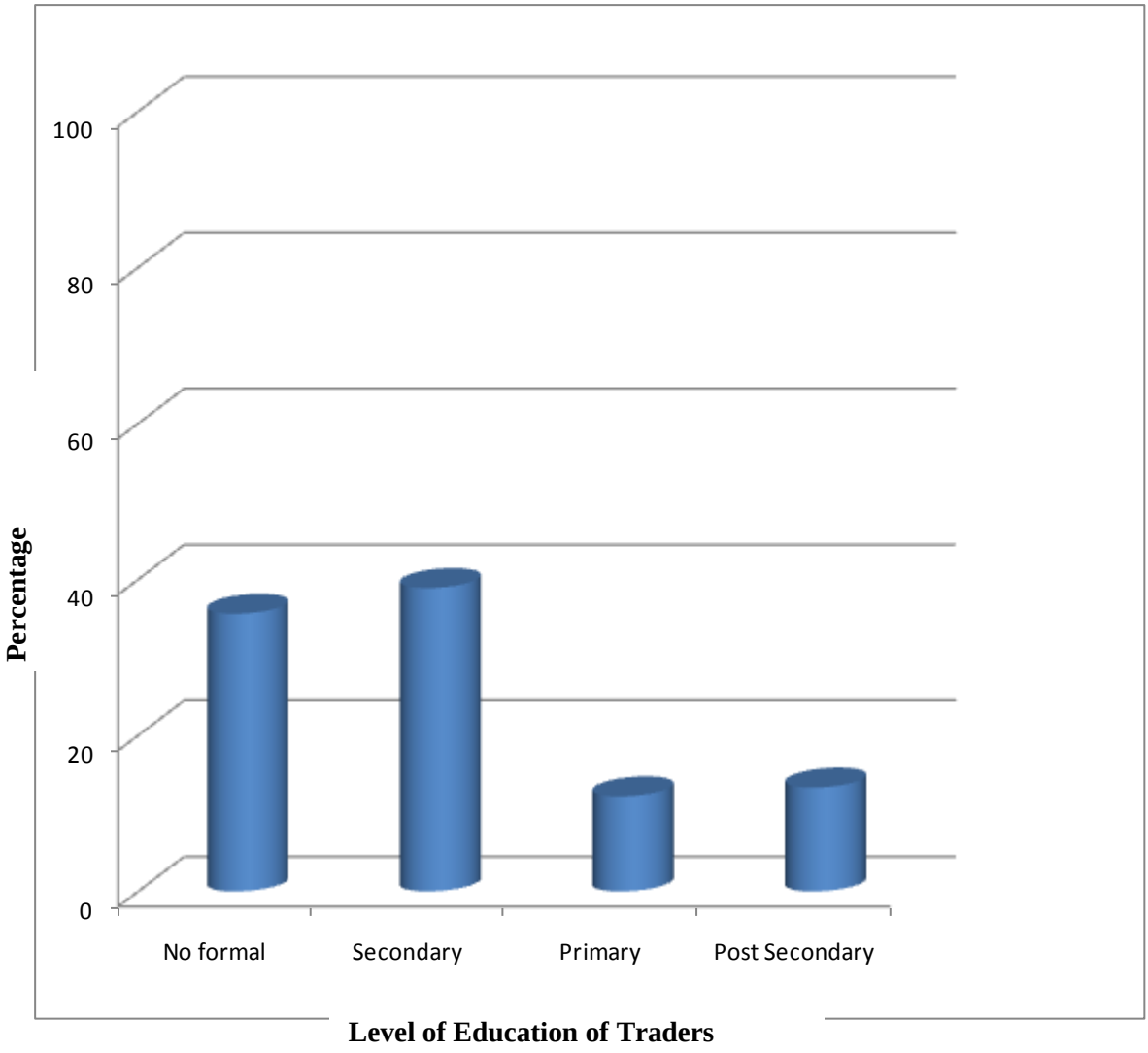


Figure 4.8: Distribution on the Level of Education of Traders

Source; Author's field survey (2014)

4.3.5 Level of Trading Experience of Traders

It can be observed from Table 4.18 that one quarter of the respondents have 5-9 years of trading experience in the study area. This is closely followed by less than one quarter of the respondents who have 15-19 years of experience. The findings suggest that must of the traders are young people who have probably inherited the business from their

parents. In addition to this most of the major commodities for sale in the distribution hub are bulky and heavy and so can be properly handled and managed by young energetic traders.

Table 4.18: Percentage Distribution of the Level of Trading Experience.

Years of Experience	Number of respondents	Percentage
<5	17	9.4
5-9	46	25.6
10-14	31	17.2
15-19	44	24.4
>20	42	23.3
Total	**180**	**100**

Source: Author's Field Survey, (2014)

4.3.6 Flow of Inter-regional Freight Transportation and Distribution of Agricultural Commodities from Kaduna State.

Agriculture is one of the back bones of Kaduna state economy as most of its people are farmers. Musa (2007) The state is blessed with favorable condition both in climate, soil, abundant land and a wide range of crops such as maize, rice, soya beans etc are grown. In addition, the state enjoys large livestock production mainly made up of cattle, goats and sheep. Majority of these commodities are for commercial purposes as such it is patronized by people involved in the transportation, marketing and distribution

of agricultural commodities who come from distant and nearby towns and cities within and outside Nigeria.

It is established from the findings that some of the destination towns have major distribution hubs where these agricultural commodities are marketed and sold to other destinations until they reach the final consumer. The findings also reveals that the destinations of some of these agricultural commodities are factories like Sun Seed in Zaria, Grand Cereals in Jos etc which use these agricultural commodities as raw materials for their industries.

It is obvious from Table 4.19 that the major destinations of agricultural commodities from Kaduna state in terms of location by location are Kano, Abuja, Lagos, Kaduna, Katsina. Jos, Lafia and Lokoja. These destinations have industries involved in the processing of agricultural products or use them as raw materials for their industries or they have large poultry farms that use these agricultural products to produce feeds. For example, Honey Well flour mills in Lagos, and Kaduna, Brewing industries in Ikeja use maize and sorghum, Grand cereals in Jos and Sun Seed in Zaria uses Soya beans, Rice milling factories in Kano also use rice etc. Destinations outside Nigeria include Cameroon, Chad, Jibiya, Maradi in Niger and Mali. These destinations are collection centers where the commodities are marketed to other destinations. Further analysis of Table 4.19 shows that distribution to Kano is highest at 9.8%, closely followed by Abuja with 7.9% while Lagos is averaging at 6.9%. The increase in the rate of distribution to these centers might not be unconnected with the population rate and the urban

densification of these locations. Similarly, international destinations show that Jibiya is highest at 1.0% closely followed by Chad at 0.5% while Cameroun is lowest at 0.2%. This thus, shows that distribution of agricultural produce from this inventory centers go beyond the borders of Nigeria indicating a sort of international trade in terms of economic growth and benefits.

Table 4.19: Destination of Agricultural Commodities within and Outside Nigeria

Destination	Freq	%	Destination	Freq	%
Abuja	47	7.9	Kaduna	33	5.6
Aba	10	1.7	Katsina	28	4.7
Abia	1	0.2	Kafanchan	4	0.7
Abeokuta	4	0.7	Kogi	3	0.5
Akure	13	2.2	Lafia	22	3.7
Abakaliki	1	0.2	Lagos	41	6.9
Asaba	3	0.5	Lokoja	23	3.9
Adamawa	3	0.5	Maiduguri	13	2.2
Awka	1	0.2	Minna	8	1.3
Bauchi	11	1.9	Makurdi	1	0.2
Benue	4	0.7	Maradi	2	0.3
Borno	5	0.8	Musawa	1	0.2
Birnin kebbi	11	1.9	Mali	2	0.3
Chad	3	0.5	Maiadua	1	0.2
Cameroon	1	0.2	Mashi	1	0.2
Dutse	1	0.2	Makarfi	2	0.3
Damaturu	5	0.8	Onitsha	13	2.2
Doso	2	0.3	Owerri	3	0.5
Dutsen ma	1	0.2	Ondo	5	0.8
Ebonyi	1	0.2	Okene	7	1.2
Edo	2	0.3	Ore	2	0.3
Ekiti	1	0.2	Offa	2	0.3
Enugu	10	1.7	Oshogbo	1	0.2
Fadan karshi	1	0.2	Oyo	1	0.2
Funtua	5	0.8	Port-Harcourt	14	2.4
Gusau	15	2.5	Potiskum	5	0.8
Gombe	13	2.2	Rimaye	1	0.2
Gwantu	1	0.2	Sokoto	9	1.5
Gezawa	1	0.2	Shagamu	4	0.7
Illela	1	0.2	Suleja	4	0.7
Ilorin	5	0.8	Uyo	1	0.2
Ibadan	6	1.0	Umshia	2	0.3
Jibiya	6	1.0	Vom	1	0.2
Jos	24	4.0	Warri	7	1.2
Jalingo	7	1.2	Yobe	5	0.8
Jigawa	4	0.7	Yola	8	1.3
Jikamshi	1	0.2	Zaria	15	2.5
Kano	58	9.8	Zamfara	9	1.5
		TOTAL		289	48.7

Source: Author's Field Survey,(2014)

4.3.7 Sources of Agricultural Commodities for Trading

Agricultural commodities such as beans, rice maize, dried pepper, onions, millet etc. were brought into the distribution hubs through different sources which include personal farm, in the market and from other farms.

Table 4.20: Percentage Distribution of Sources of Agricultural Commodities

Source	Number of Respondents	Percentage
Personal farm	31	17.2
In the market	145	80.5
From other farms	4	2.2
Total	**180**	**100**

Source: Author's Field Survey,(2014)

The results from table 4.20 reveals that more than three quarter of the respondent buy agricultural commodities for trading in the market, which shows that the respondents are business men and women who patronize the distribution hubs for commercial activities. This is followed by less than one quarter who obtain their commodities from personal farm, which shows that the respondents practice subsistence farming, while another less than one quarter get it from other farms.

4.3.8 Distribution Channels of Agricultural Commodities

The distribution of agricultural commodities in the study area follows the short channel pattern where agricultural products are moved from the farmer or the producer to the whole seller or retailer and to the final consumer. This can be depicted as follows:

Farmer ⟶ wholesaler or retailer ⟶ consumer

- ✓ The farmers: these include the local producers of agricultural produce for sale in the local markets.
- ✓ The wholesalers: these are people who buy goods in large quantity and offer them for sale to urban markets or to large scale consumers.
- ✓ Retailers: these are group of traders who buy goods from the farmers or producers and offer then for sale to road side sellers and consumers. They keep the grains in large containers for sale in measures.
- ✓ Consumers: These may either be the local or large scale consumers that require these goods for consumption purpose.

Table 4.21: Distribution of Types of Distribution Channels

Type of trader	Number of respondents	Percentage
Wholesaler	65	36.1
Retailers	72	40.0
Road side sellers	43	23.9
Total	**180**	**100**

Source: Author's Field Survey,(2014)

The result of the finding from table 4.21 shows that, more than one third of the respondents involve in the marketing of agricultural commodities in the study area are retailers. The findings also show that more than one third and less than one quarter are wholesalers and roadside sellers respectively. Roadside sellers are involve in the hawking of agricultural products in the study area by displaying their goods on the roadside carrying it on their head or push them on wheel barrow as they move in the market.

4.3.9 Problems of Marketing Agricultural Commodities in Kaduna State.

Problems of marketing agricultural commodities in the study area are multidimensional. Analysis on table 4.22 shows that traders in the study area are faced with the problem of lack of storage facilities. The findings indicates that more than half of the respondent say they do not have any storage facilities in their distribution hub while more than one third of the respondents say they have where to store their agricultural commodities in their distribution hubs. This may suggest that a lot of agricultural commodities can be damaged because of lack of storage facility. This has

been confirmed by the findings of Otitolaiye (2009) in his study of the Commercial Distribution of Agricultural produce in Nigeria, reported the inadequacy of storage facilities as one of the problems affecting the commercial distribution of agricultural commodities in Nigeria.

Table 4.22: Distribution of Problems of Marketing Agricultural Commodities

Responses	Number of Respondents	Percentage
Yes	75	41.7
No	105	58.3
Total	**180**	**100**

Source: Author's Field Survey, (2014)

4.4 Conclusion

This chapter has discussed the presentation and analysis of data obtained from the field through the use of questionnaires. The section analysed data collected from both the transporters and traders of the various distribution hubs namely Saminaka, Giwa, Soba and Makarfi. The results show that out of the 165 respondents sampled on the issue of ownership, 133 of them lay claim to their trucks while 96 respondents representing more than half use canters and 69 respondents signifying more than one third use heavy trucks, these heavy trucks are mostly involved in long distance haulage travel especially states like Lagos, Rivers, . Borno etc. while the canters transport agricultural commodities to neighboring states like Kano, FCT, Nassarawa, and Katsina. Grains are mostly supplied from the four distribution hubs with 161 respondents signifying more than half attesting to the fact. Analysis on figure 4.3, 4.4, 4.5 and 4.6 shows the directional flow pattern of

agricultural commodities from Kaduna state to towns within Kaduna state, outside Kaduna state and the neighboring countries. Similarly, analysis on the major logistical four distributions reveal that harassment by law enforcement agents is higher at more than three quarter followed by armed robbery attack indicating less than three quarter while Federal Road Safety Corps (FRSC) cause more problem during the flow of agricultural commodities with about half of the respondents indicating to it. Likewise, out of the 108 traders sampled, they indicated that most of the agricultural commodities are sourced from the market with more than three quarter of the respondents attesting to the fact while more than one third of the respondents involve in the marketing of agricultural commodities in the study area are retailers. Findings also indicate that more than half of the respondents say they do not have any storage facilities in their distribution hub while more than one third of the respondents say they have where to store their goods.

CHAPTER FIVE

SUMMARY, RECOMMENDATION AND CONCLUTION

5.1 Introduction

This section discusses the summary of the major findings of these reserach, recommendations were made on the of results obtained and general conclusion made on the investigation to freight transport flow of Agro based commodities.

5.2 Summary of Major findings

The study was designed to analyze the freight flow of Agro based commodities from Kaduna state. For the research to be conducted, both primary and secondary data were used. Questionnaire was used to obtain information from the respondents. The transportation and distribution of Agro-based commodities cannot be effectively achieved without the use of different modes of transport. Therefore transportation and distribution plays a significant role in getting the right products to the right place at the right time.

The findings show that the freight transportation and distribution of Agro-base commodities from Kaduna state to other geographical regions within Nigeria and beyond is affected by harassment by the law-enforcement agents especially the police and Federal Road Safety Corps (FRSC) causing problems like delay, harassment and extortion. Other problems include traffic congestion, armed robbery attacks on the roads, accidents due to bad road conditions and recklessness on the part of the transporters.

Most of the vehicles use in the transportation and distribution of Agro based commodities are privately owned. This implies the dominance of the private sector in the transportation and distribution of Agro based commodities. Lack of storage facilities in the distribution hubs also affect the marketing and distribution of Agro-based commodities by causing product damage which may result to lose and disincentive to marketers.

The findings also reveal that grains are the major Agro-based commodities of exchange generated by Saminaka, Makarfi, Giwa and Soba distribution hubs. These are maize, rice, soya beans, beans millet, guinea corn others are vegetables e.g dried pepper, onions and livestock. The research shows that agricultural commodities are exported to neighboring countries like, Mali, Niger, Chard and Cameroon from Makarfi, Saminaka and Giwa distribution hubs.

5.3 Recommendations

The information gathered on freight transportation pattern of agro-based commodities in Kaduna state brought to light some limitations which affects the transportation and distribution of agricultural commodities. Based on the findings of this research work the following recommendations are made in other to make the transportation and distribution more efficient.

1. Government should promote stronger private sector involvement to enhance the productivity of the operators by providing vehicles through the Sure-p programme at a subsidized rate to reduce the hardship faced by the operators so that more unemployed youths and graduates will be attracted into the transport business.

2. The National Union of Road Transport Workers (NURTW),Non Governmental Organizations (NGOS),Private sector and other relevant stakeholders should invest more in the transport sector especially in the area of international trade between Nigeria and other Countries within the West African Sub region, such as Mali Niger and Cameroon.

3. The private sector, corporate organization in collaboration with Government should contribute in building warehouses, stores in the distribution hubs so that traders will have enough space to store their goods. This will assist in protecting goods against rainfall, thieves and dust. The store and warehouses will in turn generate revenue to the state and local government.

4. Provision of traffic and parking management services for freight vehicles such as heavy trucks like trailers, Lorries and canters within the distribution hubs locality by the relevant stakeholders like the National Union of Road Transport Workers will go a long way in reducing congestion and make loading and unloading of Agro-based commodities easy.

5. The private sector and relevant stakeholders in the Transport industry should make effort towards retraining of Transporters and the low enforcement agents, this will prevent duplication of functions where one institution is carrying out the functions of another agency that is not assigned to it. Efforts should be made to reduce unnecessary delay, extortion and harassment of the transporters. Security agents with good integrity, honesty and highly disciplined should be allowed to man check points.

6. There should be proper and adequate enlightenment for transporters on the danger inherent in wrong parking especially along major highway and also stop them from exhibiting congestion habits such as wrong overtaking, one way driving, disobeying traffic signals and traffic wardens.

7. It is pertinent to note that transportation and distribution of Agro-based commodities from the source regions to various destinations is still a major problem that needs to be improved upon if the producers, traders and transporters income is to be increased. Development in the transport sector of the economy has been identified as a key factor that will facilitate the movement of agricultural produce to various destinations in Nigeria. Therefore transport infrastructure especially roads must be developed and improved if any meaningful impact is to be felt. This calls for concerted efforts from both private sector and the government to invest massively in the development of roads and maintenance of the existing ones.

5.4 Conclusion

The aim of this research has been to analyze the freight transportation flow of agricultural commodities from Kaduna state to other regions in Nigeria. The findings have shown that Kaduna state is a source region to many agricultural produce especially grains. However its transportation and distribution is bedeviled by many challenges such as harassment by law-enforcement agencies, traffic congestions armed robbery, lack of storage facilities as discuss earlier. Despite these obstacles the future prospect of agricultural produce transportation and distribution in Kaduna state and Nigeria at large would improve significantly if the suggestions and recommendations of this research are implemented. Further studies can be focus on product packaging, types, units, Handling equipments, units of measurements, transportation cost on distance ranges and seasonality of commodity flow.

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APPENDIX I
QUESTIONNAIRE FOR TRANSPORTERS
FREIGHT TRANSPORTATION FLOW OF AGRO-BASED COMMODITIES IN KADUNA STATE

Dear Sir/Ma

This questionnaire is designed to obtain information for a research on the above topic as a requirement for the award of Master of Science degree in Transport Management at the Department of Geography, Ahmadu Bello University, Zaria

The objective for the administration of this questionnaire is to analyse the inter-regional freight transportation of agro-based commodities in Kaduna state, Nigeria.

I solicit your support in providing relevant and accurate information which will all be treated with utmost confidence.

Thank you.

Masugari, Danjuma Yakubu
MSc/SCIE/2885/2010-2011

SECTION A –SOCIAL ECONOMIC CHARACTERISTICS OF RESPONDENTS

1. Sex: [a]. Male ( ) [b]. Female ( )

2. Age: [a]. < 20 ( ) [b]. 20-24 ( ) [c]. 25-29 ( ) [d].30-34 ( ) [e].35-39 ( )
   [f] 40-44 ( ) [g] 45-49 ( ) [h] 50-54 ( ) [i] 55-59 ( ) [j] 60 > ( )

3. Marital status: [a]. Single ( ) [b]. Married ( ) [c]. Divorced ( )

4. Educational status: [a]. No formal education [b]. ( ) Primary School ( )
   [c]. SSCE ( ) [d]. Post SSCE. Please specify ……..

5. How long have you been driving? [a]. < 5 years ( ) [b]. 5-9 years ( )
   [c]. 10-14 years ( ) [d]. 15-19 years ( ) [e]. > 20 years ( )

6. Types of ownership
   [a] Privately owned ( ) [b] Independent transport owners ( )

SECTION B: QUESTIONS FOR TRANSPORTERS

7. What type of vehicle are you driving?
(a) Heavy truck ( ) (b) Canter ( )

8. What type of vehicle do you use ……

9. Which type of agricultural commodities do you transport?
(a) Grains ( ) (b) Livestock ( ) (c) Vegetable crops ( ) (d) Tuber crops ( )

10. From which distribution hub do you load your freight?
(a) Saminaka ( ) (b) Makarfi ( ) (c) Soba ( ) (d) Giwa ( )

11. List the destinations you transport agricultural commodities to
(a) ……..

(b) ……..

(c) ……..

(d) ……..

13. How often do you transport agricultural products to these destinations per week?

[a] once ( ) [b] twice ( ) [c] thrice ( ) [d] four times ( )

14. What time of the day do you move?

[a] Day time ( ) [b] Night time ( )

15. Why do you choose to move at this time?

[a] It is safe ( ) [b] It is faster ( ) [c] Absence of huge traffic ( )

[d] Harassment is minimal ( )

16. Do you use any form of stimulants to keep you awake?

[a] Yes ( ) [b] No ( )

17. Have you attended any driving school?

[a] Yes ( ) [b] No ( )

18. Which of these logistical problems do you encounter while transporting agricultural commodities?

(a) Accidents ( )

(b) Harassments by law enforcement agents ( )

(c) Armed robbery attacks ( )

(d) Bad roads ( )

(e) Fuel shortages ( )

(f) Spare parts shortages ( )

(g) Pilferage ( )

(h) Traffic delays ( )

19. Which of the following institutions gives you problem in the course transporting agricultural commodities?

(a) Police ( ) (b) VIO ( ) (c) FRSC ( ) (d) Union workers

APPENDIX II

QUESTIONNAIRE FOR TRADERS

FREIGHT TRANSPORTATION FLOW OF AGRO-BASED COMMODITIES IN KADUNA STATE

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The objective for the administration of this questionnaire is to analyse the inter-regional freight transportation of agro-based commodities from Kaduna state, Nigeria.

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Thank you.

Masugari, Danjuma Yakubu
MSc/SCIE/2885/2010-2011

SECTION A –SOCIAL ECONOMIC CHARACTERISTICS OF RESPONDENTS

1. Sex: [a]. Male ( ) [b]. Female ( )

2. Age: [a]. < 20 ( ) [b]. 20-24 ( ) [c]. 25-29 ( ) [d].30-34 ( ) [e].35-39 ( )

   [f] 40-44 ( ) [g] 45-49 ( ) [h] 50-54 ( ) [i] 55-59 ( ) [j] 60 > ( )

3. Marital status: [a]. Single ( ) [b]. Married ( ) [c]. Divorced ( )

4. Educational status: [a]. No formal education [b]. ( ) Primary School ( ) [c]. SSCE ( ) [d]. Post SSCE. Please specify ……..

5. How long have you been trading? [a]. < 5 years ( ) [b]. 5-9 years ( )

[c]. 10-14 years ( ) [d]. 15-19 years ( ) [e]. > 20 years ( )

SECTION B: QUESTIONS FOR TRADERS

6. What is the name of the distribution hub…….

7. How many times does this distribution holds in a week?

(a) Once ( ) (b) Twice ( ) (c) Thrice ( ) (d) Four times ( )

(e) Everyday ( )

8. From where do you get your agricultural commodities?

(a) Personal farm ( ) (b) In the market ( ) (c) From other Farms ( )

(d) Others. Please specify……

9. Which agricultural commodity do you buy……..

10. What type of trader are you

(a) Whole seller ( ) (b) Retailer ( ) (c) Road side seller ( )

(d) Others (please specify)……

11. What type of agricultural commodity do you sell?

(a) Grains ( ) (b) Vegetables ( ) (c) Livestock ( ) (d) Tuber crops ( )

12. Which destination do you sell your agricultural commodities to?

……

13. Do you have any storage facilities in your distribution hub?

(a) Yes ( ) (b) No ( )