

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background to the Study**

The movement of households within an area is an increasingly important issue which has attracted research interest over the years (Ahmed, 1995; Pawson and Bramley, 2000; Oishi, 2010; Oluwole, 2013). This growing interest in mobility is particularly prominent within population geography (Tyner, 2013). Gobillon (2008) posits that residential mobility is necessitated by response to a change in housing needs. The response rate may have implications for the social stability of urban neighbourhood. van der Vlist, Gorter, Nijkamp and Rietveld (2001), Pawson and Bramley (2000) explained that the relatively inelastic supply of housing in the short run will cause scarcity of housing and this, in turn, will lead to social disorder. It is therefore necessary for models of landuse dynamics to consider residential relocation or mobility behavior of households in the forecast for future landuse patterns which are critical to activity and travel demand forecasting. Eluru, Sener, Bhat, Pendyala and Axhausen (2008) regard residential mobility as a critical component of landuse dynamics. This is because landuse dynamics are, in part, driven by relocation decisions made by households. Household behaviour plays a crucial role in urban system performance and can profoundly shape the urban landscape (Li, 2014).

Residential mobility, which varies widely with characteristics of the household, and which may also be influenced, in part, by neighbourhood characteristics or community – level variables, is thus one of the key factors in the demographic dynamics of the neighbourhood (Browning and Burrington, 2006; Pendakur and Young, 2013). Residential mobility is important for its influence on the local housing and labour markets and the efficient allocation of resources across the urban economy. A better understanding of the economics of housing decisions is essential for budgetary planning and taxation where local government finance is driven by population and the distribution of the housing stock (Whitehead, 1999; Kloop, 2002; Gibb, 2006; Namazi-Rad, Shukla, Munoz, Mokhtarian and Ma, 2013). Hui (2006) explained that mobility has wide-range impacts on the financial management of property issues such as consumption and

investment on housing. Residential mobility is the mechanism through which the character of social areas is maintained or changed while social areas themselves provide the context in which individuals make decisions about their residential location and subsequent mobility (Siddle, 2000; Clark and Withers, 2007). Likewise, Clark and Withers (2007) explained that the special interest the spatial demographers have in residential mobility is as a result of how residential mobility changes the character of neighbourhoods and cities.

Numerous studies have shown that the propensity to move is associated with a number of factors such as age, life-cycle stage, education, occupation, tenure, duration of residence, cost of rent and location relative to the center of the city. These factors have frequently been found to discriminate ‘movers’ from ‘stayers’. Other reasons include realtors’ involvement in the search process and tendency of households to maximize expected utility (Speare, 1974; Olatubara, 2008). Afolayan (1976) referred to the factors that may lead to changes in the initial location of migrants as ‘dislocating forces’. Ahmad (1992) and Afolayan (1994) identified social links as important reasons for residential mobility among African households. Li and Tu (2011) posit intra-urban migrants prefer to settle close to friends or relatives, or in areas where the majority of households are of the same ethnic background. Aluko (2011) buttressed this assertion by stating that neighbourhoods are geographic units within which certain social relationships exist. This behaviour in turn affects social ties and interactions, thereby leading to the consolidation, breaking and reconstruction of families and friendship groups (Holdsworth, 2013; Heath and Calvert, 2013; Coulter, van Ham, and Findlay, 2015). Spilimbergo and Ubeda (2004), Dawkins (2006) and Zorlu (2008) have shown that family ties matter in spatial mobility in the United States. Such links as kinship, family and cultural ties could lead to changes in residences as well as the expansion of certain areas of a city.

Intra urban residential migration has been a focus of intense research for the past few decades (Ayeni, 1979). However, in spite of the notable works in the area, many factors influencing residential mobility are still shrouded in obscurity (Olatubara, 2008; Oluwole,

2014; Ngamini, Apparicio, Fleury, Gregoire, Moisan, Lesage and Vanasse, 2014). For instance, little is known about the residential mobility between neighbourhoods that brings about changes in the patterns of ethnic segregation (Bolt and van Kempen, 2010). Residential segregation is defined in general terms as “the degree of spatial proximity or territorial conglomeration of families belonging to the same social group, be it in terms of ethnicity, age cohort, religious preference, or socioeconomic status” (Nieves, 2004; Limon, 2010). Krysan (2002) explains further that residential segregation is one outcome of a complex system in which prejudice, segregation, discrimination, and racial or ethnic economic disparities are simultaneously determined. Each of these phenomena influences the others. As a result of their complexity, these relationships are difficult to study, but most scholars recognize that racial and ethnic prejudice and discrimination are both causes and consequences of residential segregation.

Studies of residential mobility are implicated in spatial processes such as gentrification, ethnic segregation, and neighbourhood polarization (Coulter *et al.*, 2015; Marcinczak, Gentile, Rufat and Chelcea, 2014; Crowder, Pais and South, 2012; Hedin, Clark, Lundholm and Malmberg, 2012). Olatubara (2008) and Coulton, Theodos and Turner (2013) describe urban residential mobility as a complex process, which in turn has significant imprint on the urbanscape. Beatty, Lawless, Pearson and Wilson (2009) stated that residential mobility impacts on neighbourhood renewal in complex ways. On the one hand, mobility amongst individuals may be seen as positive, in that it may reflect access to better housing or employment circumstances. On the other hand, high levels of mobility in deprived areas can be problematic, being often associated with decreasing social capital and increasing demands on local services. The reason for and the pattern of moves are so complicated both at the micro and macro levels that they make it difficult for one to predict. Hence, Animashaun (2011) suggested the need for empirical study of residential mobility in several cities. Such a study is necessary in Kaduna metropolis as the significant political, social and economic transformations the metropolis has witnessed over a period of 1997 to 2011 would be difficult to understand without considering the role of the significant population movements within the region. Kaduna

has witnessed massive residential mobility over the period of 15 years. Hence, the unprecedented change of residences presents the metropolis as a major research interest.

## **1.2 Research Problem**

The study of intra urban residential mobility has been popular among social scientists, as it is felt that the changing economic and demographic structure of cities can only be fully understood by analyzing the underlying factors associated with residential movement patterns (Cadwallader, 1982; Huang and Deng, 2006). The dominant view during the 1970s and 1980s assumed that residential choice belongs to the broader spectrum of individual economic behavior (Sonis, 1992; Benenson, 2004). A typical example is the trade-off between housing and travel costs (Alonso, 1964; Muth, 1969; Kim, Pagliara and Preston, 2005). The closer the residential location to work (that is, the lower the commuting costs), the higher the probability that the agents will choose this location for residence. Households evaluate the benefits of particular housing locations and the costs of commuting between these locations and their work places (Clark and Huang, 2004). Basically, the optimization assumption adjusts residential distributions to the distribution of jobs, commerce and transport networks over regions (Alonso, 1964; Mills and Hamilton, 1989). However, the optimization assumption has failed to survive empirical tests. For instance, the trade-off between housing and commuting costs is either not true at all, or is so weak that it can be ascertained only after the effects of housing and neighbourhood characteristics are eliminated (Herrin and Kern, 1992; van Ommeren, Rietveld and Nijkamp, 1996; Benenson, 2004). The optimization assumption has failed to explain the unprecedented intra-city residential mobility such as witnessed in Kaduna metropolis from the tail-end of 20<sup>th</sup> Century to the first decade of 21<sup>st</sup> Century.

Gbakeji and Rilwani (2009) researched on the effect of socio-economic factors of residents on the intra-urban residential mobility process in the Warri metropolis, Nigeria. Fattah, Salleh, Badarulzaman and Ali (2015) using logistic regression method found age, occupation and tenure of households as the significant factors affecting residential mobility of households in Penang, Malaysia. Wu (2006) found age and education to be

the significant predictors of intra-urban migrant mobility in Beijing and Shanghai. Balcer, Bentley, Lester and Beer (2016) found housing affordability to be the most important driver of residential mobility of some of the Australians into less advantaged areas. Kevin, Feng, Faller, Grace, Stivell and Elsa (2014) researched on the issue of residential mobility in Congo and found inadequate means to housing affordability as an important reason for residential mobility in the city of Brazzaville. Interest in residential mobility has focused on housing affordability, increased externalities, dissatisfaction with present accommodation and changes in household structure. These factors encourage gradual relocation of households within cities. However, the massive residential mobility such as witnessed in Kaduna metropolis between 1997 and 2011 has received limited empirical attention in the literature. Hence, this study is set out to investigate the pattern, the volume, the causes as well as the implications of the mobility.

### **1.3 Research Questions**

The questions addressed in this research are:

- i. What is the pattern of residential mobility in Kaduna metropolis?
- ii. What is the rate of the residential mobility?
- iii. What is the relationship between residential mobility and distance?
- iv. What are the causes of the residential mobility?
- v. What is the relationship between residential choice and neighbourhood characteristics?
- vi. What are the implications of residential mobility in the metropolis?

### **1.4 Aim and Objectives of the Study**

The aim of this study is to analyze the pattern, rate and implications of residential mobility in a pluralistic society.

The study addresses the following specific objectives:

- i. Determine the current pattern of residential mobility within the metropolis
- ii. Determine the rate of residential mobility

- iii. Determine the relationship between residential mobility and distance
- iv. Identify the factors in residential mobility
- v. Determine the relationship between residential choice and neighbourhood characteristics
- vi. Examine the implications of the emerging residential pattern for the effective management of Kaduna metropolis

### **1.5 Research Hypotheses**

- i. The volume of residential mobility decreases with increasing distance from points of origin
- ii. Residential mobility is influenced by socio-economic and cultural factors
- iii. Residential choice is influenced by neighbourhood characteristics
- iv. There is residential segregation along sectarian lines within Kaduna metropolis

### **1.6 Significance of the Study**

Residential mobility is not a new phenomenon. However, most of the factors that induce intra-urban residential mobility are not well known (Olatubara, 2008; Ngamini *et al.*, 2014). Hence Animashaun (2011) stresses the need for more studies in several cities, most especially in the developing countries of the world so that some of the important factors that trigger mobility but are yet to be given their rightful place in the literature will be revealed. This study is designed to extend the knowledge base that currently exists in the field of residential mobility. It affirms the principles of the ‘push-pull’ theory and the model of residential tipping. It also provides new insights to the importance of religion in residential mobility. The information generated by this study, will therefore inform policy that will mitigate the negative effects of massive residential mobility in cities.

## **1.7 Scope of the Study**

This study is specifically about intra-urban residential mobility in Kaduna metropolis. It covers the entire Kaduna South and North Local Government Areas and parts of the adjoining Local Government Areas of Igabi in the northern axis and Chikun in the southern axis of the metropolis. The study covers the period of 1997 – 2011, a period that witnessed massive residential mobility within the metropolis.

## **1.8 The Study Area**

### **1.8.1 Historical Background**

Kaduna metropolis is the capital of Kaduna State (Figure 1.1). The metropolis became prominent as a result of being the administrative capital of Northern Nigeria Protectorate from 1906 to 1914. The city later became the capital of Northern Region at independence in 1960. In 1967 the Northern Region was split into six States; and Kaduna metropolis continued as the State capital of one of the newly created States: the North Central State. In 1976 the name changed from North Central State to Kaduna State and Kaduna metropolis remained the capital. In 1987 Katsina State was carved out of Kaduna State and Kaduna metropolis remains the capital of Kaduna State (Ideh, 1993; Ikhuoria, 1993; Ajibuah, 2008). Adewuyi (2008) acknowledges that the city started as a little town but has grown rapidly into a metropolis, which has engulfed the neighbouring settlements of Kawo, Kakuri, Barnawa, Sabo, Ungwa Rimi, Mahuta and Kamazou amongst others. Kaduna metropolis covers the entire Kaduna North and South Local Government Areas (LGAs) and parts of Igabi LGA in the northern axis and Chikun LGA in the southern axis of the metropolis.

### **1.8.2 Geographical Location**

Kaduna metropolis is located between latitudes  $10^{\circ} 22' N - 10^{\circ} 40' N$  and longitudes  $7^{\circ} 20' E - 7^{\circ} 28' E$ . The metropolis occupies an area of about  $260 \text{ km}^2$  and the distance between the eastern and western limits of the city is approximately 13.7 km, though this keeps changing as development increases (Adewuyi, 2008; Oluwole, 2013).

### **1.8.3 Jurisdictional Organization of Kaduna Metropolis**

The metropolis consists of four Local Government Areas (LGAs). These are Kaduna North, Kaduna South, part of Igabi and part of Chikun Local Government Area (Figure 1.2). These LGAs are subdivided into wards (Table 1.1) for administrative convenience. The wards were labelled as Kaduna North Ward (KDNW) for the wards that are in Kaduna North LGA, Kaduna South Ward (KDSW) for the wards in the Kaduna South LGA, Igabi Ward (IW) for the wards in Igabi LGA and Chikun Ward (CW) for the wards in Chikun LGA.

#### **1.8.3.1 Wards in Kaduna North Local Government Area**

Kaduna North LGA occupies an area of about 72 km<sup>2</sup> and is the most prominent of all the LGAs in the metropolis. Its Headquarter is at Doka. Most offices in Kaduna metropolis including the Central Business District (CBD) are located within this LGA. Its population is 574,375 comprising 51.3 percent males and 48.7 percent females.

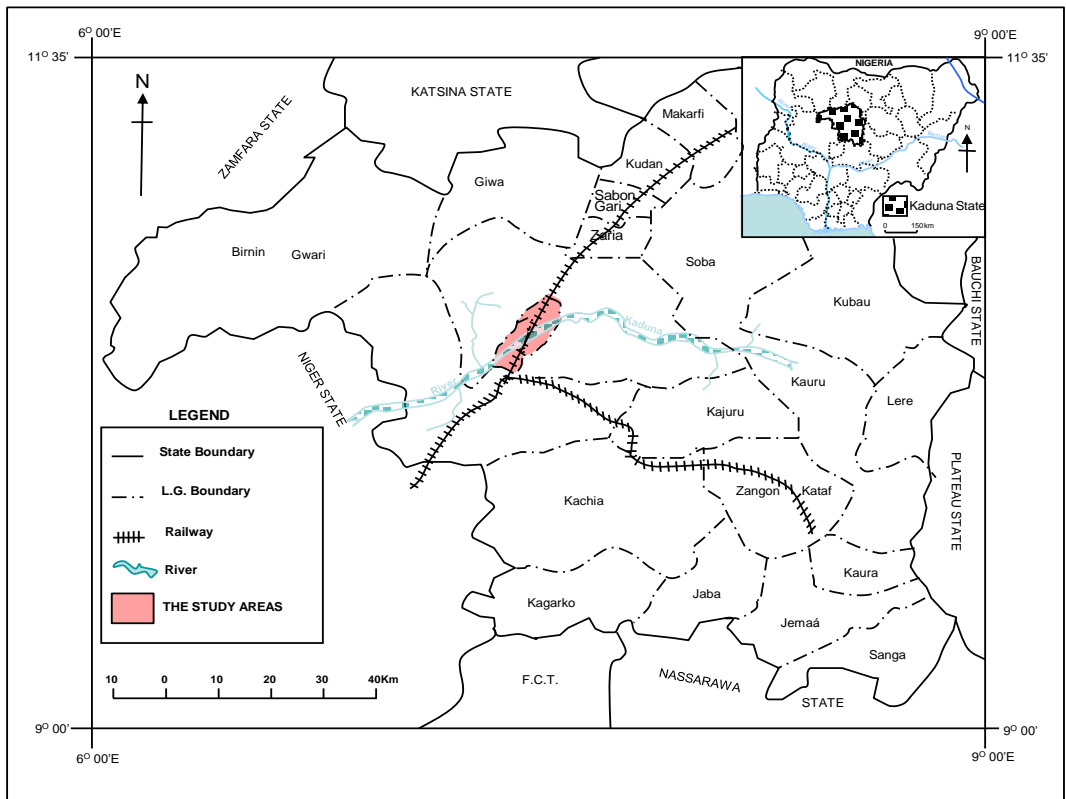
#### **1.8.3.2 Wards in Kaduna South Local Government Area**

Kaduna South Local Government Area occupies an area of about 59 km<sup>2</sup> and its Headquarter is at Makera. It is bounded in the North by Kaduna North LGA and in the West by Igabi and Chikun LGAs and in the South by Chikun LGA and in the East by Kaduna North and Igabi LGAs. Its population is 631,022 out of which 50.9 percent are males and 49.1 percent are females. The wards in this LGA are KDSW2, KDSW5, KDSW8, KDSW9, KDSW10, KDSW11 and KDSW12.

#### **1.8.3.3 Wards in Chikun Local Government Area**

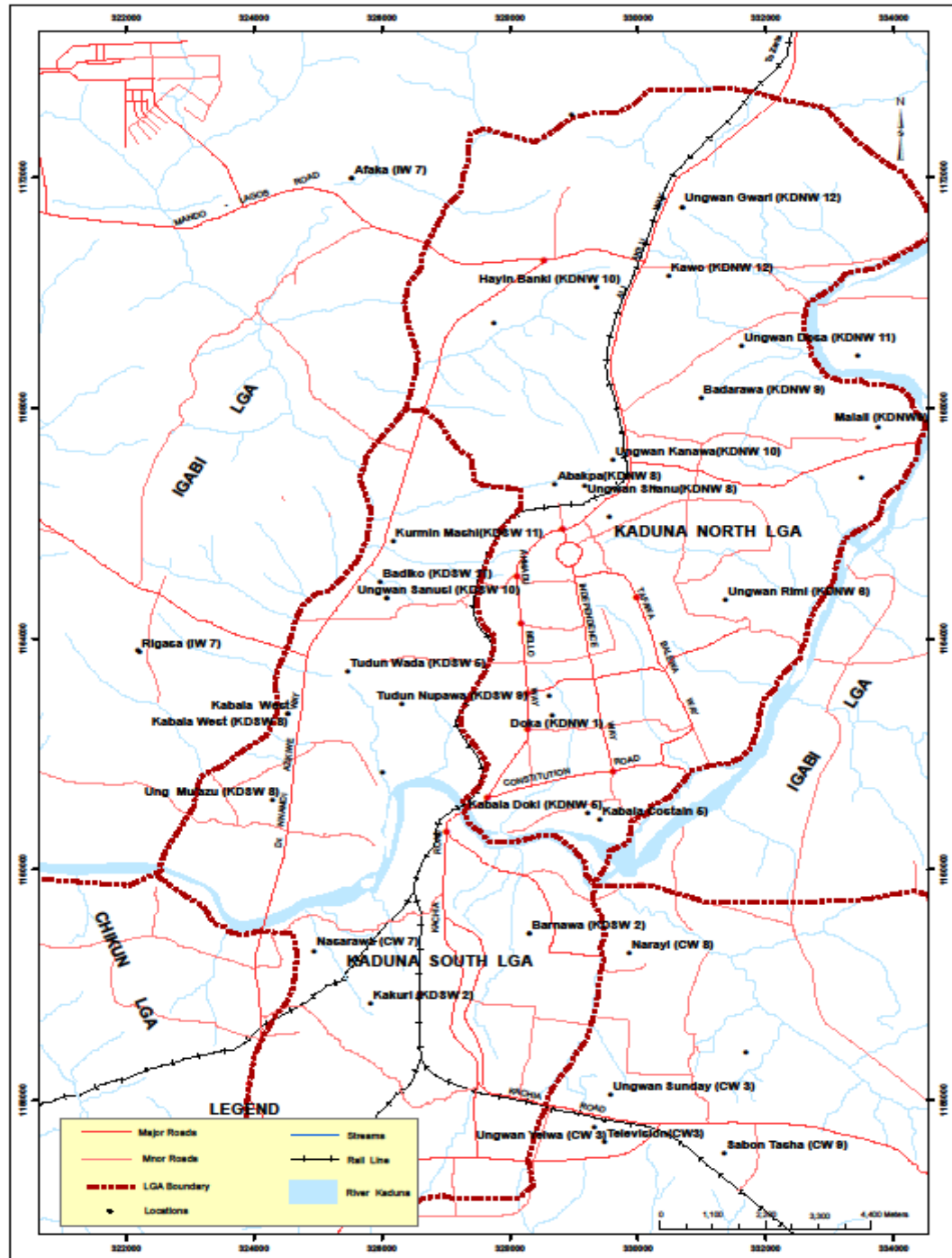
Chikun Local Government Area occupies an area of about 4,645 km<sup>2</sup>. It is only a small proportion of this LGA that is under the area of study. Likewise, Kujama, the Headquarters of this LGA is outside the scope of the study.





**Fig. 1.1: Map of Kaduna State**

(Source: Dept of Geography, NDA, Kaduna, 2015)



**Fig. 1.2: Map of Kaduna Metropolis**

(Source: Adapted from Quickbird Imagery of Kaduna Metropolis, 2002)

**Table 1.1: Local Government Areas, Corresponding Wards and Localities**

Local Government Area	Wards	Localities
Kaduna North LGA	KDNW1, KDNW5, KDNW6, KDNW7, KDNW8, KDNW9, KDNW10, KDNW11, KDNW12	Doka, Kabala Costain & Kabala Doki, Ungwan Rimi, Ungwan Sarki, Ungwan Shanu & Abakpa, Malali & Badarawa Ungwan Kanawa & Hayin Banki Ungwan Dosa, Ungwan Gwari & Kawo
Kaduna South LGA	KDSW2, KDSW5, KDSW8, KDSW9, KDSW10, KDSW11, KDSW12	Kakuri & Barnawa, Tudunwada Kabala West & Ungwan Muazu, Tudun-Nupawa Ungwan Sanusi, Kurmin Mashi & Badiko Sabongari
Chikun LGA	CW3, CW7, CW8, CW9	Ungwan Yelwa, Ungwan Sunday & Television Nasarawa, Narayi, Sabon Tasha
Igabi LGA	IW7	Afaka & Rigassa

Source: Author's Fieldwork, 2011

Chikun LGA is situated at the Southern part of the metropolis and is bounded in the North by Igabi and Kaduna South LGAs. Its population is 300,191 out of which 50.3 percent are males and 49.7 percent are females. There are four wards in this Local Government Area: CW3, CW7, CW8 and CW9.

#### **1.8.3.4 Ward in Igabi Local Government Area**

Igabi Local Government Area (LGA) is one of the adjoining LGAs to Kaduna North and Kaduna South LGAs. It stretches along the western part of Kaduna South and Kaduna North LGAs and at the Northern fringe of Kaduna North LGA and tapers down at the eastern part of the Kaduna North LGA and to the south of it is Chikun LGA. Turunku its administrative headquarters is not within the scope of this study. The notable ward in this local government Area is Igabi Ward (1W) 7.

#### **1.8.4 Road Transportation Network**

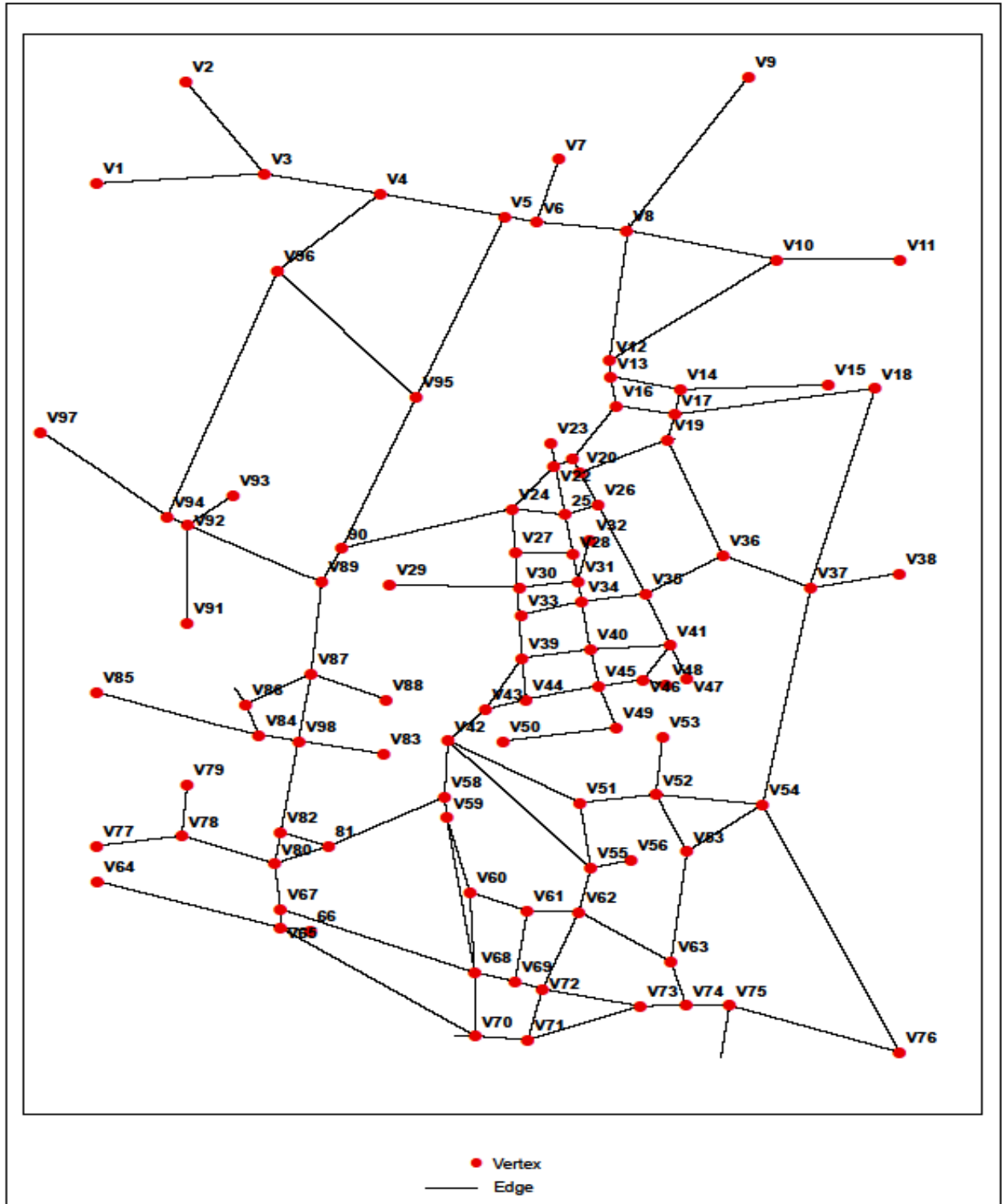
The road network in Kaduna metropolis is very extensive with beautiful roundabouts constructed at major nodes to ease movement of traffic. The network within the metropolis is endowed with numerous loops. There are three bridges across river Kaduna to facilitate the movement of commuters from the southern part of the metropolis to the northern part and vice-versa. These are the bridge on Nnamdi Azikwe ring road at Ungwa Muazu, the bridge on station-stadium road by Ahmadu Bello Stadium and the newly constructed bridge on Ungwa Rimi - Refinery road. Most of the roads within the metropolis are well tarred. The evaluation of the connectivity of road network in Kaduna metropolis is based on one of the graph theoretic measures (Gamma Index) introduced by Kansky (1963).

The gamma index is the ratio between the actual and the maximum possible number of edges in a graph. It is computed as  $\gamma = \frac{e}{3(v-2)}$  in which e is the actual number of edges, v is the number of vertices and 3(v-2) is the maximum possible number of edges in a graph. The limits of the gamma index are 0 and 1. The performance of road network depends on its topological characteristics which help to define its connectivity and direct influence on

economic development of a region (Oluwole and Daful, 2014). The topological representation of the major roads (see Figure 1.2) in Kaduna metropolis (Figure 1.3) shows that there are 127 edges (e) and 98 vertices (v). Hence, the value of gamma for the major road network in Kaduna metropolis is 0.44. This value indicates a poor level of connectivity and a dire need for improvement. Adewuyi (1998) observes that city dwellers' movement facilitated by various modes of transportation enables spatial interaction to take place enabling places of demand to be linked with sources of supply. The existing road network has contributed positively to mobility within the metropolis.

### **1.8.5 Population**

Right from the period of colonial administration, Kaduna metropolis recorded a steady growth in population from 10,653 in 1931, through 44,500 in 1952 to 149,910 in 1963 (Kore, 2003). The census figures of 1991 put the population at 976,272 out of which 518,180 (53%) were males and 458,092 (47%) were females (Kaduna State of Nigeria, 1991). The 1991 census gave a growth rate of 3.2% per annum for Kaduna State hence Kaduna would have a population of 1,073,035 in 1994, 1,179,378 in 1997, 1,295,623 in 2000 and 1,487,454 in 2005 (Adewuyi, 2005; Adewuyi, 2008). This projection is realistic because the census figures of 2006 put the population of Kaduna metropolis at 1,570,331 (NPC: 2006). From the 2006 census figures, Chikun LGA has a population of 372,272 out of which 187,433 were males and 184,839 were females. Igabi LGA has a population of 430,753 out of which 217,414 were males and 213,339 were females. Kaduna South LGA has a population of 402,731 out of which 204,969 were males and 197,762 were females. Kaduna North has a population of 364,575 out of which 187,075 were males and 177,500 were females. It can be observed that males were more in number in all the LGAs than the females. The population density of the city grew from 155 people per km<sup>2</sup> in 1931 to 1,077 people per km<sup>2</sup> in 1960; by 2000 it had recorded 4,148 people per km<sup>2</sup> and 4,540 people per km<sup>2</sup> in 2005 (Adewuyi, 2005; Adewuyi, 2008).



**Fig. 1.3: Topological Graph of Major Roads in Kaduna Metropolis**  
 (Source: Author's Fieldwork, 2011)

The population of Kaduna metropolis is distributed over the high, medium and low density residential areas of the city. The low density residential areas are the Government Residential Areas (GRAs) of Malali in the northern part of the city and Barnawa in the southern part of the city. The medium density residential areas are the areas located not far from the city centre, while the high density residential areas are typical of the Ungwas, for example, Ungwan-Sarki, Ungwan-Kanawa, Ungwan Rimi, and Ungwan-Boro.

#### **1.8.6 Ethnicity and Religion**

Kaduna metropolis attracted different individuals and groups from diverse socio-cultural backgrounds before, during and even after independence (Ajibuah, 2008). The ethnic groups in Kaduna metropolis are Hausa, Fulani, Yoruba, Ibo, Igala, Idoma, Adara, Atyap, Bajju, Gbagyi, Gure, Gwong, Ham, Jaba, Kadara, Kagoma, Kagoro, Kaninkon, Koro, Kuramo, Moro'a Ninzo, Numana, and many others. The main religions of the people in the metropolis are Islam and Christianity. There are few traditional worshipers and few that do not belong to any major religion. The low density and the medium density residential areas of the city are not dominated by any particular ethnic or religious group. However, the high density residential areas of the metropolis are dominated by certain ethnic and/or religious groups. For instance, Ungwan Boro, Ungwan Pama, Ungwan Makama, Ungwan Romi and Sabo areas of the metropolis are dominated by Christians and heterogeneous ethnic groups. On the contrary, Ungwan Rimi, Ungwan Sarki, Ungwan Muazu, Ungwan Kanawa, Tudunwada and Rigasa are dominated by Muslims and Hausa/Fulani ethnic groups.

#### **1.8.7 Landuse**

Kaduna metropolis, being the administrative capital of the defunct northern Nigeria, is well laid out. The Central Business District (CBD) is located in Kaduna North Local Government Area. The CBD houses the largest market in the metropolis (Kaduna Central Market). It provides general purpose items such as fabrics, cooking utensils, food items, electronics and lot more. The CBD also has commercial banks, insurance and brokers'

firms, eateries, offices of various sorts such as headquarters of different telecommunication firms, individual and corporate organizations' offices. Apart from the central market, there are other markets in the metropolis such as Sabo market, Sunday market and Kawo market. The industrial area of the metropolis is in Kaduna South Local Government Area. The industries include breweries, textile factories, electrical cable manufacturing industry, long-span roofing sheets factory, and motor vehicle assembly plant, around Kakuri area of the metropolis. Industries in other parts of the metropolis include Federal Super Phosphate Fertilizer Company Plc, National Oil and Chemical Company, and Kaduna Petrochemical Refining Company. Private and public corporation offices are located all over the metropolis. The State Government Secretariat is not far from the Nigerian Television Authority while the Federal Government Secretariat is not far from Sir Kashim Ibrahim House. Market gardening takes place along river banks and streams while most of the other areas of the metropolis are residential areas.

### **1.8.8 Housing Development**

Housing is a sign of urban development. The City has been experiencing tremendous housing development over the years. Apart from Kaduna State Government Low Cost Housing Estates in Barnawa, Narayi and Sabo, housing development in the metropolis is largely in the hands of private investors. Private investors prefer to build for high income tenants who can afford to give them a good return on their investments (Max Lock Consultancy, 2008). In trying to bridge housing deficit in the metropolis, the Kaduna State Government signed a Memorandum of Understanding (MoU) with Trans Atlantic Integrated Development Limited for the construction of 3,000 units of houses under its Public Private Partnership (PPP) on Mass Housing Scheme which will cover the metropolis and other towns in the State.

This study could not establish the housing stock in the metropolis. There are multiple regulatory planning authorities in Kaduna with conflicting information. Skinvington (2012) noted that there is no instrument in place to prevent uncontrolled development in the outer areas of the City and any City-wide body to oversee planning in the metropolis.



Attempt to establish the current housing stock through some agencies was not successful. The officials of the Primary Health Care in the State are known for marking all the buildings they visit during child oral immunization programme. When contacted, their data only captured the households that have eligible members (ages not more than 5 years) for immunization. Hence, their data captured only eligible households in the houses visited. The 2006 Population Census also captured the data on the households within the metropolis (NPC: 2006) but failed to capture the available number of houses. In Kaduna metropolis, housing development is influenced by increasing demand for housing. People move to new areas to search for accommodation. The demand for accommodation inspires private investors to build houses to meet the demand for housing.

## **CHAPTER TWO**

### **LITERATURE REVIEW AND THEORETICAL FRAMEWORK**

#### **2.1 Literature Review**

Residential mobility which is the change of residences by households within urban areas has been the focus of research in the past few decades. In this chapter, the reviews of literature are in different parts. These are the analytical approaches to the study of residential mobility, factors associated with migration, reasons for moving, the decision to move, the search for a new residence, and choosing a new home.

##### **2.1.1 Analytical Approaches**

Studies of residential mobility can be conveniently subdivided into micro- and macro-analytical approaches. The micro approach focuses on the characteristics of ‘movers’ and ‘stayers’, and is concerned with the construction of models that realistically represent the individual decision making process involved in residential mobility. The traditional migration theory focuses on the assumption that residential mobility occurs when individuals compare the costs and benefits of moving to a particular destination with the costs of staying in a present area. Thus at the individual level, the socio-economic characteristics of movers is very important (Cadwallader, 1982; Massey, 1990). The macro approach has been used in two main contexts (Moore, 1971; Erginli and Baycan, 2011). First, to identify the spatial pattern of mobility rates, and second, to establish the interrelationships between mobility rates and other features of the urban environment, for instance, economic, demographic, and housing characteristics (Erginli and Baycan, 2011). At the macro level, mobility patterns are influenced by factors associated with the opportunity structures of both the place of origin and the place of destination (Massey, Arango, Hugo, Kouaouci, Pellegrino and Taylor, 1994). Notwithstanding the manner or scale of approach to residential mobility studies, many factors are associated with residential mobility.

### **2.1.2 Factors Associated with Residential Mobility**

Olatubara (2008) and Animashaun (2011) posit the ability to respond to a desire or aspiration to change residence depends on certain factors. These factors include the conditions in the housing market, the urgency of the factors motivating a change in residence, the ability to cope with stress, dissatisfaction with the present residential location, dislike for type of people in the neighbourhood, eviction notice, and the possibility of getting accommodation within a desired residential district.

Brummell (1979), Schafft (2005), Kamruzzaman, Washington, Baker and Turrell (2013), and Mateyka (2015) opine that a household decides to move in response to a perceived difference between what the household has and what the household believes it could have through relocation. The decision to move is however based on households' residential stress. Villaraga, Sabater and Modenes (2014) opine household residential mobility is associated with living conditions, age and income. Clark and Huang (2003) stated that age is an essential predictor in models of residential mobility. They noted that younger households move more frequently than older households. Angelini and Laferrere (2011) studied residential mobility in Europe and found the residential mobility of the European elderly to be low. However, those who moved in old age tend to reduce housing consumption and investment by going from owning to renting. Angelini and Laferrere (2011) explain that this 'downsizing' is positively linked to housing capital gains, while the existence of mortgages in a country reduces it. Also as households increase in size, they require more space, thereby adjusting to the housing stock (Clark, 2011; Clark and Huang, 2003).

Tenure is another critical differentiator in models of residential mobility as owners, with more locational capital, move less frequently than do renters (Levine, Perkins and Perkins, 2005). This is because the cost of moving for home owners is an additional constraint on moving. Hui (2006) envisaged that renters based their mobility decisions on demographic factors while owners, on the other hand, tend to view home buying as an investment. Sherraden (2005) explained that home ownership is one of the strongest

predictors of residential permanence. He however cautioned that it is not clear whether reduced mobility leads to home ownership, or home ownership leads to reduced mobility. Therefore causality is open to question in most studies, but what is clear is that owners move less frequently than renters. Alkay's (2011) study of the residential mobility pattern in the Istanbul metropolitan area found that renters are more mobile than owners. Residential mobility, regardless of tenure can be seen as a rational decision making process of utility maximization (Clark, Deurloo and Dieleman, 2006). Thus, the decision of movers hinges on the disposition of socio-economic cum political factors prevailing at a point in time and space.

The mismatch between families' housing needs and the actual space they have available is also a mobility predictor. For instance, research in the United States, Holland, Germany and Britain shows that there is a direct link between the need for more space and household relocation decisions (Clark and Huang, 2003). It has also been observed that individual mobility decisions are influenced by socioeconomic characteristics, as well as their perception of the level to which their residential situation meets their needs (Baker, 2008). Amongst other factors, Sinai (2001) identified the use of housing for income generation as a possible determinant of intra urban mobility. This has to do with the relocation to apartments both for shelter and/or for income generation through informal sector activities. An extended model of mobility includes measures of marital status, birth of a child, and change in marital status and income. Alkay (2011) noted that the prevailing factors will determine whether there are enough reasons to move or not.

### **2.1.3 Reasons for Moving**

Reasons for movement of households are very essential in residential mobility decisions and as households are considered to be the primary unit of residential mobility decisions (Steele, Clarke and Washbrook, 2013). The reasons for change of residences by households can be distinguished as voluntary and involuntary moves. As Rossi (1980) showed in his classic study of migration in Philadelphia, involuntary moves make up a significant proportion of the total number of households that moved, and majority of

these were precipitated by property demolitions and evictions. In addition to these purely involuntary moves is a further category of 'forced' moves arising from marriage, divorce, retirement, ill - health, death in the family and long distance job changes. Ahmed's (1995) research on the pattern of residential mobility in Bahawalpur City, Pakistan, found that the residents of Bahawalpur City were largely immobile. About 70% of the households had not changed their residence in spite of their long stay in the city. The few families that changed their residence were renters and students. Some of their reasons for changing residences include misunderstanding between the tenant and landlord, education of the children, economic and social factors.

In his study of residential mobility in Leicester, England, Pritchard (1976) demonstrated the way in which most people moved frequently within local communities. He found that longer distance moves were most often undertaken by those with higher incomes and that the effect of this residential movement within urban areas was to sustain working class communities but also increase levels of segregation between groups as those on higher incomes distanced themselves from the least attractive neighbourhoods. Afolayan (1994) discloses that inadequate supply of housing for workers and students of the tertiary institutions in Ibadan around the institutions' premises in the mid 1970s forced many of them to look for alternative places to live. Afolayan (1994) also posits that movements within the city could be influenced by social links. Hedman (2012) observed that social ties are among the most important factors that determine destination choices on the international or national scale but much less is known about their role in short-distance mobility. He examined how the presence of extended family in a neighbourhood affects destination choices in a local housing market in the city of Uppsala, Sweden. He employed a probit model to investigate who is more likely to move to neighbourhoods where extended family members are resident, followed by a conditional logit model that tests the importance of the presence of family in relation to other neighbourhood characteristics. The results show that the presence of family is indeed a strong determinant for neighbourhood choice and that non-Western immigrant middle-aged

adults with low socio-economic status are most likely to move near family (Hedman, 2012; 2013).

Clark and Huang (2003) studied mobility in British housing markets and used data from the British Household Panel Survey (BHPS). Age, tenure, and room stress were found to be significant predictors of moving. In addition, Clark and Huang (2003) found the life course ‘triggers’ of marital-status change and in some situations birth of a child to have played important roles in moving within housing markets in the United Kingdom. The results of their research also support the view that residential mobility is a demographically driven process. Residential mobility is associated with the human life cycle such as personal and family attributes as well as the residents’ housing profiles such as home ownership and housing type (Fattah *et al.*, 2015). However, many of the key insights of the life – course approach have yet to be fully operationalized in residential mobility research (Coulter and van Ham, 2013). Generally, residential mobility is associated with specific changes in households, changes in housing condition and changes in the housing market. van der Vlist *et al.* (2001) regard changes in households as the reason why families move but Knox and Pinch (2000) acknowledge that the reasons given for moving are not always entirely reliable. Some people have a tendency to rationalize and justify their decisions, others may not be able to recollect past motivations, and most will inevitably articulate reasons that are simpler and more clear-cut than the complex of factors under consideration at the time of the move. Nevertheless, survey data are useful in indicating the major elements that need to be taken into consideration in explaining movement behaviour.

#### **2.1.4 The Decision to Move**

Knox and Pinch (2000) have maintained that the first major decision in the residential mobility process whether or not to move home can be viewed as a product of the stress generated by discordance between household’s needs, expectations and aspirations on the one hand and its actual housing conditions and environmental setting on the other. Knox and Pinch (2000) opine whatever the household’s expectations and aspirations may be,

the crucial determinant of the decision to move is the intensity of the stress (if any) generated as a result of the difference between these and its actual circumstances. The point where tolerable stress becomes intolerable stress will be different for each household. However, once the point is reached, the household must decide between three avenues of behaviour: environmental improvement which embraces a wide range of activities depending on the nature of the stressors involved, lowering aspirations which is an alternative means of coming to terms with existing housing conditions, and residential relocation which has to do with the actual change of residence.

Alkay (2011) viewed mobility as a product of housing opportunities and the housing needs and expectations of households. Therefore, residential mobility and urban structure have a circular and cumulative effect on each other. Patterns of household mobility have been primarily explained by changes in social organization, such as changes in family structure and by economic and social forces, such as increases in employment opportunities and wages. It is known that intra-urban residential mobility processes are based on a number of notions which include life style aspirations and the spatial configuration of the city. Moore (1972) and Ayeni (1979) identified four classes of life style aspirations. The first, described as consumption oriented aspiration, is typified by the situation whereby emphasis is placed by a household on enjoying the material benefits of the modern urban society. The behaviour of the affluent single person or the young unmarried person is of this form. The second is called social prestige oriented aspiration. In this case, emphasis is placed on a life style perceived to be appropriate to one's job and position within the community. The third is family oriented aspiration, and it involves the provision of the right type of environment for children. In western cities, this behaviour is the cause of movement to the suburbs. The fourth is described as community oriented aspiration and places emphasis on the nature of the interaction with others who have the same set of group oriented values. It is important to know that households of different types are not equally mobile. Hence, it becomes imperative to examine the characteristics that differentiate 'movers' from 'stayers' (Alkay, 2011). The

decision to move, however, leads to a second important area of locational behaviour, the search for and selection of a new residence.

### **2.1.5 The Search for a New Residence**

Cullingworth and Caves (2003) observed that the people of the United States are constantly on the move – to seek better accommodation in order to improve their housing conditions or less frequently to obtain cheaper accommodation. Whatever might be the reason, all relocating households must go through the procedure of searching for suitable vacancies and then deciding upon the most appropriate new home. Cadwallader (1982) observe that the search for available alternatives has generally focused upon the role of information acquisition and utilization. The mass media, specialized agencies, such as real estate agents, display boards, and the household's network of social contacts, are all important sources of information about housing vacancies. Dada (2009) explains what should be considered in the search process. He notes that the search for accommodation in an area one is not familiar with will at first involve finding out information about the neighbourhood from friends and residents. It is necessary to find out how safe the place is, ask neighbours about previous tenants and if possible ask to look around the property while the present tenants are still there. In Nigeria where electricity supply is very erratic, it is important to find out about the schedule of supply for the area. There is also the need to find out about the personality of the potential landlord. Is he the troublesome type? Will he reside in the same building with his tenants or does he live elsewhere? What are the responsibilities of the landlord on the property and what are the limits of what the tenant can do? Dada (2009) expressed concern about the prospective tenant's income whether it will allow him to afford the house or not. This is because there is no point taking up an accommodation that one's income cannot support. Likewise, it is not just the rent that will be paid; utility bills are also to be considered.

Knox and Pinch (2000) contributed immensely to the literature on the search procedure. They identified the general objective of the search procedure as finding the right kind of dwelling, at the right price, at the right time. Knox and Pinch (2000) posit that though



there are some households that do not have to search deliberately because their decision to move comes after accidentally discovering an attractive vacancy, the majority of movers, must somehow organize themselves into finding a suitable home within a limited period of mind boggling decision. Most households organize the search procedure in a way focusing attention on particular neighbourhoods which are selected on the basis of their perceived situational characteristics and the household's evaluation of the probability of finding vacancies satisfying their site criteria. They also considered the issue of the relative importance and effectiveness of different information sources for different households. They maintained in their work that accessibility to information sources is also related to another important issue affecting residential behaviour: the problem of search barriers. There are two important aspects of this problem: barriers that raise the costs of searching or gathering information, and barriers that explicitly limit the choice of housing units or locations available to households. The final part of the decision making process, however, has to do with the choice of a new home.

#### **2.1.6 Choosing a New Home**

The final part of the decision making process has required researchers to identify the evaluative dimensions across which individuals assess the relative desirability of neighbourhoods, or houses. Also, it has required researchers to identify the appropriate combination rules for deriving an overall utility value for a specific neighbourhood, or house, from measurements of the evaluative dimensions of that neighbourhood, or house. Johnston (1973) suggested that the major evaluative dimensions used to discriminate between alternative neighbourhoods can be conveniently categorized as representing physical characteristics, social characteristics, and location. Giudice *et al.* (2009) stated that household residential location choice is a complex function of a wide range of housing and location attributes. The importance of these attributes will vary across different types of household (Kim *et al.*, 2005; Giudice, Paola, Torrieri, Pagliari and Nijkamp, 2009). Brandstetter (2011) divided the variables that could influence the residence choice process into three groups viz: (i) Socio-economic characteristics of the inhabitants (age, sex, income, patrimony, occupation, marital status, family life cycle,

size and family composition and home ownership) (ii) Economic circumstances (residence price, financing, and inflation) and (iii) Characteristics of the desired residence (location, area and quality). Pagliara and Wilson (2010) and Limbumba (2010) clustered the factors under three main themes viz: (i) Accessibility to the Central Business District and workplace (ii) lifecycle of households and (iii) neighbourhood, environment and the community

Residential choice can be influenced by a wide range of factors. These include income level of households, journey to work, employment opportunity and access to good infrastructural facilities (Oyebanji, 2003; Pagliara and Wilson, 2010; Shawal and Ferdous, 2014). A household's residential choice could be as a result of socio-economic, cultural, administrative or psychological reason (Sanni and Akinyemi, 2009). Residential location choice could be influenced by religious and ethnic affiliations, security of neighbourhood and cost of land. Households may desire to reside in areas having people with similar social characteristics. They may decide to live very close to friends and acquaintances. This is believed will help to maintain a high level of kinship and social ties (Pagliara *et al.*, 2002; Galster and Santiago, 2006; Ogunbajo, Ajayi, Usman and Wali, 2015). Limbumba (2010) posit the factors influencing residential location choices of individuals to include access to good environment, nearness to place of work, closeness to friends and relatives, cost saving and availability of land. Fattah *et al.* (2015) found housing type to be an important factor of residential location choice. Other determinants are access to recreational and educational centers, time and costs of transportation (Mohammadzadey, Ghanbari and Nazemfar, 2015). Housing affordability also influences residential choice. Okesoto, Oke and Olayiwola (2014) examines the residential location preference of population working in the Central Business District of Lagos Central, Nigeria. They observed that workers expressed preference over where they will like to live but could not have their residential location preference because housing affordability had made a greater proportion of the working population not to be able to live within the envisaged rings of their working environment.

Megbolugbe (1989) observed that housing is not just a game of numbers, but one of congruence between people on the one hand and their housing and its environment on the other. Given this premise, it is expedient to assume that people are rational in their actions, not only in the strict economic sense but on a gross self-assessment or 'self-audit' of their own social, psychological, health and even economic circumstances. The self-audit leads to 'self-selection' and those who fail to self-select on these bases become highly susceptible to problems in their housing and its environment. Problems which arise from failure to self-select might warrant adapting to, or migrating from the residence. Therefore, the process of self-selection acts as a sorting procedure which brings about congruence between households and their housing environment. Studies by British researchers have paid more attention to the role of neighbourhoods, including the inter-connection with residential choice and household decision-making. In a review of the significance of neighbourhood, Kearns and Parkinson (2001) argue that the type of neighbourhood can be a source both of opportunity and of constraint. It can foster belonging and attachment and, of course, by extension play a role in potential mobility. Neighbourhoods can also be 'traps' which make upward mobility very difficult (Entwisle, 2007). The studies by Brower (1996), Butler and Robson (2001), and Forrest and Kearns (2001) were designed to investigate the way in which neighbourhoods shape life chances.

Rents vary greatly within neighbourhoods. Dada (2009) suggested that a household may have to consider living a little outside where it actually wants to be for a fraction of the cost and larger apartment size. He also stated that it is important for the household to identify its needs before committing its resources to a property. The household will prefer a property that will satisfy family needs. Is the property located in a good neighbourhood and are the schools around it good enough for the children? What about the ease of transportation to and from the households work place? Is there reliable water supply or does the household have to provide for water? What about sources of noise pollution in the neighbourhood – places of worship, market, musical record sellers among others? Arimah (1990) observes that the choice of housing and its location must have to be made

from the available housing stock. The producer of housing acts almost independently of consumers' preferences, but on the basis of his estimation of the potential profit which is likely to accrue from his investment. This made Sheffer (1990) to imply that housing allocation in the city is based on financial affordability.

Entwisle (2007) noted that where people live is a matter of choice, at least to some extent. Friendly climate, socioeconomic and ethnic composition, safety, accessibility, and quality of the natural and built environment may influence where people choose to live. When choosing a neighbourhood, people may anticipate the consequences of living there. People may also choose neighbourhoods based on their potential to enhance health and to avoid negative outcomes. In addition, it is important to know that the change of intra-urban spatial structure is largely the aggregate outcome of residential mobility and residential location choice (Kim, 1994; Knox and Pinch, 2000; Wu, 2004). Security has long been recognized as an important element in residential choice (Kay, Geisler and Bills, 2010). For instance, Agbola (2002), and Megbolugbe (1991) posit that a man may first and foremost, look for safety and security in his choice of residence. This is an important need for self preservation. Thereafter, man seeks to satisfy self-esteem and self-actualization.

## **2.2 Theoretical Framework**

Theories of migration which are also applicable to residential mobility are clearly divisible into two groups. The first comprises those that take as their starting point the questions 'Why' and 'Who', that is, who migrates and why? What forms do migrations take? Why do migration streams take on particular patterns in time and space? Such theories are concerned with the causation and structuring of migration. They search for motivations and constraints, and generally attempt to account for the forms and processes of migration. The second group of theories takes a different line of approach, their objective being to explain the effects of migration on varying physical, social, economic and political environments. These impact theories deal with the impacts on origins and

destinations together with those on the migrants themselves. This section examines some of these theories as they relate to residential mobility.

### **2.2.1 Distance Decay Function**

Distance decay function replicates the empirical fact that the interaction between two locations decreases as the distance between them increases (Karlsson, Anderson and Norman, 2015). O'Leary (2011) opines that numerous studies have established that distance decay exists. For instance, van Koppen and Jensen (1998), Bernasco (2006), Santilla, Pekka, Manne and Angelo (2007) and Gimpel, James, Kimberly, John and Shanna (2008) found clear evidences of distance decay effects in their studies. Reilly (1931) observes a decrease of intensity in shopping trips with distance. Halas and Klapka (2015) observe a decrease of intensity in daily travel to work with distance. Distance decay measures are commonly encountered in the analysis of population structures (Lloyd, Shuttleworth and Wong, 2014). Most residential moves are made over comparatively short distances (Clark and Maas, 2013; Cooke, 2013). Tobler (1970) observed that everything is related to every other thing but near things are more related than distant things. The volume of commuting between two locations depends significantly on the distance between them (Drobne and Lakner, 2014). Distance decay effect is crucial in geographical research (Haggett, 1965). The role of distance on migration gave rise to the modeling of spatial interactions (Ravenstein, 1885). Distance is the major factor that influences the values of interaction intensities (Halas, Klapka and Kladivo, 2014). Nevertheless, Coulter *et al.* (2015) observe that researchers pay less attention to short-distance residential mobility than international migration. The understanding of distance decay effect is crucial to this study.

### **2.2.2 Systems Theory**

de Haas (2008) defined migration systems as spatially clustered flows and counter-flows of people, goods and capital (remittances) between a particular community of origin and a particular destination. Migration systems theory fundamentally assumes that migration changes the socio-cultural, economic and institutional conditions at the sending and

receiving ends (de Haas, 2008; Bariagaber, 2014). The theory provides a useful framework with which to understand how macro-structural forces are linked to individual migrants (Douglass and Roberts, 2014). The application of systems theory to migration as pioneered by Mabogunje (1970) has been the most comprehensive attempt at integrating both first (endogenous) and second order (contextual) migration system feedbacks so far (Kallstrom, 2011). Mabogunje (1970) and Kallstrom (2011) defined migration system as a set of places linked by flows and reverse-flows of people, goods, services, and information, which make easy further exchange between the places (Bakewell, de Haas and Kubal, 2011; Skeldon, 2014). Borrowing from general systems theory, Mabogunje (1970) focused on the role of flows of information and new ideas (such as ideas on what is the “good life” and new consumption patterns) in shaping migration systems. Mabogunje (1970) stressed the importance of feedback mechanisms through which information about destinations is transmitted back to the place of birth. de Haas (2008; 2010) opine that information is not only instrumental in facilitating further migration, but suggests that new ideas and exposure to urban life styles transmitted back by migrants may also increase aspirations to migrate. Mabogunje (1970) and de Haas (2010) posit that migration system links people, families, and communities over space which results in a rather neat geographical structuring and clustering of migration flows, which is far from a “random state”. The central idea of the systems approach is that the exchange of capital and people between certain areas takes place within a particular economic, social, political and demographic environment (Jennissen, 2007; Lebhart, 2005). Likewise, people relocate to an environment that is best suited to them. Mabogunje (1970) based his analysis on rural-urban migration in Africa. However, migration systems theory can be extended to residential mobility and to a large extent international migration (Fawcett, 1989; Kritz, Lim, and Zlotnik, 1992; de Haas, 2010; Kurekova, 2010).

### **2.2.3 Concept of Invasion-Succession-Dominance**

One of the relevant concepts in residential mobility is the zonal patterning of socio-economic status associated with the sequence of invasion-succession-dominance (Burgess, 1924). This model was based on the pressure of low-status in-migrants arriving

in inner-city areas. As this pressure increases, some families penetrate surrounding neighbourhoods, thus initiating a chain reaction whereby the residents of each successively higher-status zone are forced to move further out from the centre in order to counter the lowering of neighbourhood status. The concept of invasion-succession-dominance provides a useful explanatory framework for the observed sequence of neighbourhood change in cities where rapid urban growth is fuelled by large-scale in-migration of low-status families. Nevertheless, Knox and Pinch (2000) explained that the concept of invasion-succession-dominance is of limited relevance to most modern cities, since its driving force, that is, the inflow of low-status migrants is diminishing in importance as the bulk of in-migrants are now middle-income families moving from a suburb in one city to a similar suburb in another. Kirst-Ashman (2007) based the invasion-succession model on the idea that conflict occurs when new groups of people having racial, cultural, or religious characteristics move into areas already inhabited by people with different characteristics. A new group will invade and the other will withdraw. Invasion, therefore, is the tendency of each new group of people coming into an area to force existing groups out; while succession is the replacement of the original occupants of a community or neighbourhood by new groups.

#### **2.2.4 The Intervening Opportunities Model**

Intervening opportunities models are developed based on a residential location specific travel preference function (Cheung and Black, 2005). The model was originally used in the context of migration, but has since been used more widely in the field of transportation to model trip distribution pattern (Ahmadinejad, Afandizadeh and Yadi, 2013). The conceptual foundation rests on the idea that the movement behaviour of individuals in space obeys the principle of least effort. Individuals will consider opportunities that are closest to them first, and, if they find them unacceptable, they will go on to the next closet opportunity or opportunities (Rogerson, 2006). Alternative vacancies may create opportunities at a less desired residential location and if migrants are constrained by socio-economic factors, they may eventually relocate to such site(s). Wu (2006) stated that given the shortage of affordable housing in developing cities, many

migrants have no choice but to settle for substandard housing at a less desired residential location. The basic evaluation process in this approach is that of trade-offs between the alternatives that can best be explained by the theory of consumer behaviour.

### **2.2.5 Theory of Consumer Behaviour**

Brumell (1979) and Quigley and Wienberg (1977) viewed mobility behaviour as a search for optimal solutions, adopting either directly or indirectly the general framework provided by the theory of consumer behaviour to analyze mobility decisions. This theory represents a general theory of evaluation and choice based on the idea that consumers attempt to obtain a combination of quantities of goods which maximizes their satisfaction or utility, subject to certain constraints such as income. However, consumer behavior could sometimes be guided by self-related motives rather than by rational economic considerations (Cisek, Sedikides, Hart, Godwin, Benson and Liversedge, 2014). Residential satisfaction can as well be used to evaluate user's perceptions regarding the inadequacies of their residential environment (Onibokun, 1973; Francescato, Weidemann and Anderson, 1989). Individuals adjust quantities of goods on the basis of opportunity cost. An important aspect of this theory is its generality, which permits a variety of interpretations (Breen, van de Werfhorst and Jaeger, 2014). It need not for example imply perfect economic rationality. It may be interpreted in a manner consistent with a behavioural approach. The theory of consumer behaviour, therefore, seems to provide a framework for developing a theory of mobility behaviour (Julsrud, 2014). The model is based on the concepts of place utility, attainable aspirations, needs, and residential stress (Brumell, 1979; Clark *et al.*, 2006). The basic idea is that a household decides to move in response to a perceived difference between what the household has (its experienced place utility) and what the household believes it could have through relocation (its attainable aspirations). The level of utility associated with these aspirations is the household's aspiration place utility. The decision to move is based on the difference between experienced and aspiration place utilities, which is defined as the household's residential stress. The actual decision, however, is also affected by various constraints, particularly the household's specific needs and income (Brumell, 1979).



Lieber (1978) expressed the overall attractiveness or place utility of a potential destination,  $A_i$ , as a function of the attributes on which individuals judge geographical places or situations.

Thus:

$$A_i = f(Z_{ik}), k = 1, \dots, n \dots\dots\dots (1)$$

Where

$A_i$  = the perceived attractive force or place utility of destination  $i$

$Z_{ik}$  = the value of the  $k^{\text{th}}$  variable in relation to the  $i^{\text{th}}$  destination that contributes to the place utility of  $i$

$f$  = the specific function that relates the  $Z_{ik}$  attributes of each place to the overall values of place utility,  $A_i$ .

Such a model can be developed for the case where the  $Z_{ik}$  values are themselves a function of the perceptions of each individual decision maker for the different levels of relevant attributes present at each alternative location. People move only if calculated benefits that would accrue to them are higher than the cost to be incurred (Afolayan, 1976). In such moves, any household is faced with a complex set of decisions that involve tradeoffs based on his perception.

### 2.2.6 Tiebout Model

Tiebout (1956), most known for his development of the Tiebout model, is frequently associated with the concept of ‘feet voting’, that is, moving to another jurisdiction where policies are closer to one’s ideologies, instead of voting to change any government and/or their policies. Indeed, from a policy perspective, it is important to understand how residential mobility affects geographic polarization of events is important for identifying intervention programmes that can arrest the proliferation of spatial inequalities (Haynes and Martinez, 2015). Marsh and Kay (2006) provided explanation for Tiebout model by stating that the consumer-voter may be viewed as picking that community which best

satisfies his preference pattern for public goods and then moves to such community. Hence, mobility can be seen as the means of registering demand, and the resulting distribution of households will approximate an ideal market situation. This is the essence of what has become known as the 'voting with feet' model. Coulombel (2010) explained further that the crux of the Tiebout hypothesis is that individuals have heterogeneous tastes for public services. As a result, they look for communities that are in accordance with their tastes. The ability to pay for public services also varies among individuals as a result of income heterogeneity. The main finding of the model is that because the residents have freedom of movement, government and residents will determine an equilibrium provision of local public goods in accordance with residents' tastes, hence sorting population into optimum communities.

The Tiebout model assumes that there are many local governments and that they provide a mix of services that will attract prospective residents (Fischel, 2008). However, the problem with the model is that it is only verbal, its propositions are not stated precisely, and its conclusions are not established properly. In particular, it is not clear what Tiebout had in mind when he claimed that the consumer-voter may be viewed as picking that community which best satisfies his preference pattern for public goods as a consumer may patronize a region for many reasons (Kvasnička, 2011).

### **2.2.7 The Behavioural Approach to Mobility Studies**

In urban geography, the growth of behavioural research arose from the rising dissatisfaction associated with the inability of the factorial ecology method to explain how spatial patterns were created, maintained and/or changed. For many, processes and spatial form can be linked in the analysis of household behaviour (Bassett and Short, 1980; Monk, 2011). Wolpert (1965) argued that aggregate models, including the gravity models, were of limited use in explaining patterns of mobility. To understand population movement it was essential, he argued, to comprehend the behavioural aspects of the decision to migrate. Afolayan (1976) and Knox and Pinch (2013) explained the behavioural approach as the way people perceive happenings in their environment which

undoubtedly affect their reactions to such happenings. Response to such conditions may take two forms: either a person moves to the desired place or remains in the old place and makes the best use of the situation. The first type of response gives rise to the spatial patterns that are observed because it denotes change over space while the second type of response might be influenced by duration of residence effect.

### **2.2.8 The Principle of Cumulative Inertia**

This principle relates to duration-of-residence effect whereby the longer a household remains in a dwelling the less likely it is to move. The principle is usually explained in terms of the emotional attachments that develop towards the dwelling and immediate neighbourhood and the reluctance to break-off the increasingly strong and complex social networks in favour of the unknown pattern of daily life elsewhere. In contrast, experience of moving home may reinforce the propensity to move. Movers are more oriented to future mobility than are persons who have not moved in the past and are better able to actualize a moving plan and choice (Knox and Pinch, 2010; Gaube and Remesch, 2013).

Many scholars of community attachment and integration have contended that residential mobility or individual length of residence in a community is one of the most important factors influencing individual's local social bonds and associated ties (Kang and Kwak, 2003; Kasarda and Janowitz, 1974; Sampson, 1991). This line of research dubbed the 'system model' of community attachment has received empirical support (Kasarda and Janowitz, 1974). Length of residence has been found to correlate with various features of community attachment, including local friendship (Liu, Ryan, Aurbach and Besser, 1998), community interest (Orupesa, 1992), local participation (Kasarda and Janowitz, 1974) and local media use (Stamm, Emig and Hesse, 1997). Length of residence by extension is cohort effects which refer to the commonalities of experience shared by individuals who are born at the same time and live out their lives under similar structural conditions (Stockdale and Catney, 2014). Length of residence in community research is important enough to have prompted Viswanath, Kosicki, Fredin and Park (2000) to characterize individual – level variable as an 'investment in the community'. Alkay

(2011) however observed the duration of time in the residence to have reflected a different pattern from previous studies in Istanbul where it appears not to have reduced residential mobility. In a situation where the stress generated by residential dissonance increases to intolerable limits, the principle of cumulative inertia may no longer be effective. It will be essential at this stage to consider a model that will explain the effect of stress on mobility.

### **2.2.9 The Stress- Threshold Model**

The stress – threshold model is of the view that people do not consider moving unless they experience residential stress (Rossi, 1955; Wolpert, 1965; Brown and Moore, 1970; Speare, 1974; Phipps and Carter, 1984; Baum and Hassan, 1999; Knox and Pinch, 2010). Conceptual models of residential mobility argue that moving is a household response to housing stress, which is generated when there is disequilibrium between households housing and location requirements and their current housing situation (Coulter, van Ham, and Feijten, 2011; Clark and Ledwith, 2006). Housing stress is thought to be generated when the dwelling and/or neighbourhood in which a household resides no longer meet the needs and preferences of its members (Feijten and van Ham, 2009). Households decide to move in response to rising stress, attempting to relocate to a new dwelling which better satisfies their changing needs, desires and aspirations (Coulter *et al.*, 2011; Brown and Moore, 1970). The stress can build up gradually and generate dissatisfaction, which in turn stimulates regular sequence of moving desires, intentions and expectations (Kley, 2010; Lu, 1999; Coulter, van Ham and Feijten, 2012). Disequilibrium can also be produced more rapidly by life events such as union formation or dissolution, child birth or changes in employment status (de Groot, Mulder, Das and Manting, 2011; Mulder and Hooimeijer, 1999). The stress-threshold approach suggests that the decision to stay or move occurs in stages: The first stage deals with the decision to consider a move; the second stage marks the search for alternative destinations; while the third stage deals with choices among alternative destinations. The alternative destinations may be defined by the housing characteristics and neighbourhood effect.

### **2.2.10 Spatial Assimilation, Place Stratification, and Ethnic Enclave Models**

Understanding the complex pattern of demographic characteristics of movers and map patterns of movement streams is crucial. Adams (2006) and Snidal (2012) identified three models of residential mobility for racial/ethnic minorities: spatial assimilation model, place stratification model, and ethnic enclave model. The classical sociological model of assimilation essentially describes a process through which members of an ethnic or racial minority group adopt the behaviour, culture and ways of life of majority group (South, Crowder and Chavez, 2005). Painter, Yang and Yu (2004) describe assimilation theory as a straight-line process of adaptation and acculturation leading immigrants to a state of structural integration into the host society. The model asserts that as minorities and immigrants obtain the socio-economic and human capital development similar to whites, their residential patterns will also become comparable (Taeuber and Taeuber, 1965). The spatial assimilation model assumes that, upon entry, immigrants cluster mainly with their co-ethnics in neighbourhoods that are not of the highest quality. Once they acquire higher levels of education and income, immigrants seek to bring their residential status in line with their improved socioeconomic status. As a result, immigrants leave their ethnic neighbourhoods as they undergo this process of translating their socioeconomic mobility into residential attainment (Massey and Denton, 1985; Friedman, Singer, Price and Cheung, 2005). A potential outcome of this process is a decrease in the inequality present between the residential characteristics of minorities and those of majority group members (Logan and Alba, 1993; Friedman *et al.*, 2005).

In contrast, the place stratification model, also referred to as ethnic disadvantage model, assumes there are barriers to residential mobility and integration through acts of discrimination and prejudice (Massey and Denton, 1993; Iceland and Scopilliti, 2008). This model focuses on the role that prejudice and discrimination play in restricting residential options for minority groups. It is based on the view that the host group differentiates people into racial groups based on perceived phenotypic or physiognomic similarity (Scopilliti and Iceland, 2006). The experiences of racial and ethnic groups depend on their place within this racial and ethnic hierarchy. They further explain that

research on Blacks in the United States has found support for the place stratification model. Blacks have high levels of segregation and tend to live in less desirable neighbourhoods that have higher rates of poverty and crime. Place stratification for racial minorities implies that racial inequality is an integral part of the social structure reflected by the unequal spatial distribution of minority groups and their residential segregation from the white majority (Logan, Alba and Leung, 1996). The model further suggests that differential characteristics of neighborhoods are associated with the uneven distribution of minority groups (Darden and Kamel, 2000; Freeman, 2000). The place stratification model points to persistent racialization as the main cause of segregation, suggesting that even as groups do better they will remain spatially disadvantaged by both inter-group relations and structural constraints limiting residential and economic mobility.

Schensul (2009) made us to know that place stratification can occur as a result of government legislation. He pointed out that in Durban, place stratification was legislated: communities were zoned for races, so people's race explicitly prevented them from moving to different neighbourhoods, regardless of their economic or cultural characteristics. The result of the research showed that White people lived in the vital core areas of cities, where there was access to services and infrastructure, buoyant economic activity and prospects for class and residential mobility. On the other hand, Africans lived in peripheral or poorly located townships, the opposite in every respect: cut off from economic opportunity, and indeed from the core area of the city, with inadequate infrastructure and little opportunity for advancement. Indians and Coloureds lived in geographical areas between Africans and Whites. Class stratification for the majority of the population, was an outcome of a legal structure that reflected the racial hierarchy in Durban. However, residential and economic mobility are not tied to race in post-apartheid Durban. Few groups may concentrate geographically in certain neighborhoods and to form ethnic enclaves (Qadeer, 2004; Hiebert, 2000). An ethnic enclave is an ethnic community which retains some cultural distinction from surrounding areas. It may be a neighbourhood, an area or an administrative division based on ethnic groups. Ethnic enclaves shape the physical and social landscape of an area. The ethnic enclave model

asserts that residential location is determined by preferences for sharing neighbourhoods with the same racial and ethnic groups (Wikipedia, 2010). Ethnic enclaves are basically urban neighbourhoods in which immigrant groups or ethnic minorities are residentially concentrated (Zhou, 2013). Terzano (2014) however, posit understanding the roles of ethnic enclaves requires some understanding about immigrants' identities, as some immigrants become blended into society over a period of time, while others sometimes retain their cultural heritage and traits helping to form a multicultural or pluralists' society.

Abrahamson (1996), Wilson and Portes (1980) and Wilson and Martin (1982) noted that there are economic benefits to be derived by living with others of the same group. Headrick (2007) explained that the model provides a scenario whereby compounds of high and low status may be directly next to one another instead of neighbourhoods in which apartment compounds exhibit relatively homogeneous status markers. The 'ethnic residential niche' model states that immigrants with a strong cultural, social and financial capital may settle in suburbs where identifiable well-off immigrant neighbourhoods will emerge. Such neighbourhoods are characterized by greater ethnic and racial diversity than is the case in the spatial assimilation model in inner-city enclaves as well as in suburbs. Some authors have called these new residential patterns 'ethnoburbs' in reference to the formation of ethnic suburbs (Sandoval-Strausz, 2011; Liu and Geron, 2008; Audebert, 2009). Lancee and Schaeffer (2015) observe that studies on ethnic diversity and social cohesion are predominantly cross-sectional. Shvarts (2010) and Greve and Salaff (2005) posit enclaves are a social system of families, neighbours, friends, and acquaintances that engage in ethnic employment and consumption. Their ethnic boundaries are socially defined: they recognize each other as people like us.

### **2.2.11 Agent-Based Modeling of Urban Segregation as Self-organizing Phenomena**

Race and ethnic issues are important in the conversations about the housing segregation phenomenon (Clark, 2009). One of the first agent – based models was Schelling's (1971, 1972, 1974, 1978, 2006) model of residential tipping which showed how the preferences

of autonomous individuals about where to live give rise to (unanticipated) aggregate patterns of residential segregation, that is, the model shows how micro-motives can lead to unintended macro-behaviour (Benenson, 2004). Ethnic concentration in the neighbourhood is often thought to compel ethnic minorities' social ties with majority group members (Vervoort, 2011, 2012; Bannister and Kearns, 2013). Keels, Duncan, Deluca, Mendenhall and Rosenbaum (2005) explained that when choosing residences, each ethnic group prefers to live in neighbourhoods that have large percentages of its own members. Bruch and Mare (2011), Macy and Willer (2002), Bonabeau (2002) and Bhavnani, Miodownik and Nart (2008) observe that agent based models link individual mobility to neighbourhood dynamics and represent the feedback mechanism between individuals' behavior and aggregate processes.

Residential distributions in cities populated by people of two non-friendly types tend to display segregation. Schelling (1971, 1974) and Sakoda (1971) independently published this basic result in the early 1970s. They used this model with explanatory chessboard to question the long-term consequences of individual tendencies to locate within friendly neighbourhoods and to relocate when residential dissonance increases (Zhang, 2011; Wilensky and Rand, 2015). In their model, the chessboard was populated with constant number of agents of two types, that is, Black (B) and White (W), whose overall number was much below the number of cells. The cells themselves were set as designating location only. The residential behaviour of the model agent was determined by the residential dissonance between the agent and her neighbors within the 3x3 square neighbourhoods around the agent's location.

Schelling and Sakoda differed in the way they computed local residential dissonance and formulated rules of agent reaction to dissonance (Table 2.1). In the table, attraction is scored 1, neutrality is scored 0 and avoidance is scored -1. In Table 2.1a, agents are attracted to the agents of their type and avoid agents of other type, in Table 2.1b agents are neutral to the agents of their type and avoid agents of other type, while in Table 2.1c, agents are attracted by agents of their type and neutral to agents of the other type. In



**Table 2.1: Attitudes of Agents to Their Neighbours**

a. Sakoda I			b. Sakoda II			c. Schelling		
Agent Type	Neighbour type		Agent Type	Neighbour type		Agent Type	Neighbour type	
	B	W		B	W		B	W
B	1	-1	B	0	-1	B	1	0
W	-1	1	W	-1	0	W	0	1

Source: Benenson, 2004

Schelling's (1971) experiments, agents located in cells where their own type is less than halves of the agents in such cells migrates to the closest free cell, where the fraction of agents of their own type is above 50 percent. Sakoda (1971) assumes that an agent tries to optimize her state and repeatedly estimates her potential dissonance at each empty cell within a 3x3 square neighbourhood. If vacancies better than the current one are found, an agent migrates to the best of those options. Initially, agents are randomly distributed on the chessboard in each model; they make decisions in sequence, according to a preliminary order established in advance. Thus, the models show that socially determined local residential preferences do result in full segregation in the long run. Although Schelling's ideas are well known to students of residential mobility and segregation, they are seldom used to analyze neighbourhood change in real populations, nevertheless Maloutas (2004) maintained that implicitly rather than explicitly, segregation is still considered to be generated through the 'shifting and sorting' of population produced by residential mobility. Some researchers have advanced Schelling's model of residential segregation in their studies. For instance, Stoica and Flache (2014) proposed a computational model of school segregation that is aligned with a corresponding Schelling-type model of residential segregation. Dodson (2014) recast Schelling's model as a network model which opens the model up to network analysis. The analysis allows the easy definition of a 'social network' that is overlaid on Schelling's 'neighbourhood network'

### **2.2.12 The Concept of White Flight**

Brama (2006) describes 'White Flight' as the process whereby White 'flees' when the share of Black residents in their neighbourhood exceeds a certain proportion of the population. The critical level at which this happens is referred to as the 'tipping-point'. Krysan (2002) identifies the conditions under which white flight does and does not occur, and has also demonstrated that it cannot be ignored as one of the many contributing causes of persistent segregation. In addition, he notes that there are considerable institutional and structural barriers to racial integration. African Americans are and have been routinely and systematically barred from living and purchasing homes in

predominantly or overwhelming white neighbourhoods by practices, such as block busting, red lining, racial steering, discrimination in obtaining financing and insurance, and countless other subtle and not – so – subtle policies and practices. Haines (2010) explains that urban decay may develop as a result of white flight. This in turn will make housing to be more affordable because of the exit of higher income households. Haines (2010) explains further that the new residents are also less likely to be homeowners and thus tend to participate less in community development. Consequently, communities with low income households are left devoid of infrastructural resources such as good schools, libraries and police stations; and as such, they face social problems like teenage pregnancies and high crime rates. Byrnes (2009) agreed with the fact that racial changes do occur when blacks move into white areas, namely increasing numbers of lower-income blacks, decreasing school quality and deteriorating economic conditions.

### **2.2.13 The SimSeg Model**

The SimSeg model was specifically designed for the purpose of conducting simulation experiments of segregation dynamics (Choi, 2013; Fossett 1998, 2006). In the formulation, agents are “virtual households with the ability to search in a virtual housing market and make residential choices (Buskens, Raub and van Assen, 2012). Households have preferences for co-ethnic contact specified in terms of the percentage of co-ethnic households found in the neighbourhood in which the household lives or to which it is considering moving” (Berg and Hoffrage, 2010; Fossett and Warren, 2005). The results of the simulation can be summarized in three major findings. First, ethnic preferences have the theoretical capability within the constraints of the model, of course, to produce substantial levels of ethnic segregation without discrimination. Second, ethnic preferences and social distance dynamics not only generate high levels of majority – minority segregation, but high levels of minority – minority segregation. Third, hyper segregation can arise in the context of the simulation model and is an outcome of the interaction of housing quality, neighbourhood quality, and ethnic preferences. In all, ethnic segregation may be sustained by multiple sufficient causes, including preferences and discrimination (Fossett, 1998; Fossett, 2006).

#### **2.2.14 Choice Based Lettings**

Manley and van Ham (2011) apply Choice Based Letting (CBL) to the housing sector in England. Manley and van Ham (2011) stated that the CBL has been widely introduced to the social housing sector in England to give applicants more freedom where they live. The authors expressed the concern that giving people choice in residential locations has the potential to increase neighbourhood segregation. Manley and van Ham (2011) stated that a lack of real choice might be the cause of social and ethnic segregation in England. Non availability of real choice makes the most vulnerable to access the easiest housing options: often in deprived and segregated neighbourhoods. Choice based lettings allow councils to allocate some of their housing according to tenant choices on more of a first come first served basis. The process creates a responsive system driven by the choices of tenants rather than administrative fiat (Gibb and MacLennan, 2006). In addition, the residential choices available to social sector tenants can be on the increase through choice based lettings (Forrest and Lee, 2002). However, choice based lettings are easier to introduce successfully in areas of low housing demand where there are relatively high numbers of vacancies. The introduction of choice based letting into social housing in high demand areas will be more difficult to achieve while maintaining a commitment to house the neediest people (Kemp, 2006).

#### **2.2.15 The Push-Pull Theory**

Yang (2010) stated that the earliest classical approach to the explanation of migration is the push-pull theory and that the theory can be traced back to the pioneering work of Ravenstein (1889), who analyzed internal migration in England from 1871 – 1881, and the refinement by an American demographer, Lee (1966), who formulated it as a general theory of migration for both internal migration and international migration. The push-pull theory of mobility suggests that mobility is as a result of an individuals' assessment of three sets of factors. These are the strains and conditions that push the person to consider leaving his place of origin; characteristics of destination area that attract the person; and intervening factors that either lower or raise the cost of carrying out the move. Ravenstein's (1889) laws of migration indicates that unfavourable conditions in one place

such as oppressive laws and heavy taxation “push” people out and favourable conditions in an external location “pull” or draw people to that location. Kainth (2009), Biddle and Yap (2010) and Animashaun (2011) defined push factors as those factors which operate to induce or encourage households to change their residence in a city. Pull factors on the other hand are the attractions which make people to select the particular new housing and/or its location instead of alternatives. Regional economic studies, for instance, suggest that migrants are allured by amenities nearly as often as by low taxes (Waltert and Schlapfer, 2010; Holey and Donoghue, 2011).

Ravenstein’s (1889) laws stated that the primary cause for migration was better external economic opportunities; the volume of migration decreases as distance increases; migration occurs in stages instead of one long move; population movements are bilateral; and socio-economic differentials (e.g., gender, social class, and age) influence a person’s mobility. Many theorists have built on Ravenstein’s theory and the dominant theories in contemporary scholarship are more or less variations of his conclusions. Lee (1966) reformulated Ravenstein’s theory to give emphasis to internal (or push) factors. Lee also explains the effect of intervening obstacles on migration process. He argues that variables like distance, climate, terrain and political barriers can impede or even prevent migration. Lee explains that the migration process is selective because different factors affect people’s response to movement. Furthermore, personal factors such as a person’s level of education, and family ties can induce or impede migration. However, Animashaun (2011) stated that the change of residence by urban households in cities of the developing countries is rare because of severe handicaps imposed by limited stock of housing.

### **2.3 Issues Arising From the Literature Review/Theoretical Framework**

The change of residences by households within urban areas is defined as residential mobility, and it is an issue which has attracted considerable attention over the years in the developed countries like Britain and the USA. However, very few studies on residential mobility have been undertaken in the developing countries of the world. Hence, it is needful to search for regularities in intra-urban movement in the developing world in the

belief that such regularities, if they exist, might help to illuminate a key dimension of the relationships between residential mobility and urban ecology. The literature on residential mobility can be subdivided into micro and macro analytical approaches. The micro approach is concerned with the construction of models that realistically represent the individual decision making process involved in residential mobility, while the macro approach has been used to identify the spatial pattern of mobility rates and to establish the interrelationships between mobility rates and other features of the urban environment. Many factors are associated with mobility. These factors include household characteristics, conditions in the housing market, urgency of the factors motivating a change in residence, ability to cope with residential stress, dissatisfaction with the present residential location and possibility of getting accommodation within a desired residential district. Variables such as age, life cycle stage, education, occupation, tenure, duration of residence, and location relative to the center of the city have frequently been found to discriminate ‘movers’ from ‘stayers.’

Movement is an integral part of human existence from its origin to the present (Datta, 2004). Hence, numerous theories have been applied to mobility studies. It is in such vein that mobility is expressed as an integral aspect of life on this planet and people move for different reasons. Such movements affect the communities which migrants leave and the communities that receive these migrants. Although a comprehensive theory is unattainable, it remains a crucial task to explain why people move. Age old debates about movement frequently point to “push” and “pull” factors. Hence, the conceptual framework for this study is the “push” and “pull” theory of migration. The “push” and “pull” theory of migration is adopted as the conceptual framework for this study because it synthesizes the various theoretical perspectives already reviewed in this study. Basically, most of the causes of households’ movement can be narrowed down to dissatisfaction with their current residence (push factor) and/or attraction at alternative residential location (pull factor). The debates continue today in public policy circles with a focus on “pull” factors such as family, employment and public benefits and “push”

factors such as inter-tribal and religious crises. Hence, this study helps to expand the frontier of knowledge by providing a new insight into residential mobility.

## **CHAPTER THREE**

### **METHODOLOGY**

The general factors which contribute to residential mobility within cities have been examined across disciplines using a wide variety of approaches. In this study, descriptive and explanatory approaches were used. These approaches provide answers to ‘why people move’, and characteristics of the movers. This chapter spells out the methodology employed in this study.

#### **3.1 Data Types and Sources**

Primary data via field survey were the key data in this research. Questionnaire (Appendix 1) was administered in the field to derive data on socio-economic and cultural characteristics of the respondents such as age, sex, income, marital status, educational qualification, access to information, religion, ethnicity, migration history etc. The secondary data, 1991 census figures, were obtained from the National Population Commission (NPC: 1991) reports and information on the existing wards in the metropolis was obtained from Kaduna State Urban Planning and Development Authority (KASUPDA).

#### **3.2 Reconnaissance Survey**

Reconnaissance survey was first carried out in the study area. This was done to get acquainted with the various census tracts and the neighbourhoods where the research took place. During the reconnaissance survey, the boundaries of the four Local Government Areas (LGAs) and the Wards within them were identified. In the Kaduna North LGA, nine Wards were identified, in the Kaduna South LGA, seven Wards were identified, in Chikun LGA, four Wards were identified, while in Igabi LGA, only one Ward was identified to be part of the study area.



### **3.3 Pilot Survey**

A pilot survey was carried out at Janruwa (a census tract in the study area) to test the adequacy of the survey instruments and to gain some experience ahead of the main survey. During the survey, field assistants administered the instruments for the study after intensive training for the field work was conducted for them.

### **3.4 Sampling Technique**

Census tracts (Localities in Table 3.1) were used as the spatial units for the household sampling. The projected 1991 National population figures were used for this study. This is because by 2011, the 2006 population figures are yet to be disaggregated into wards and localities. In this study, the national growth rate of 2.8 percent is preferred to the Kaduna State growth rate of 3.2 percent for the data to have national acceptability. Sample size calculator by Macorr Research Solutions online (n.d.) was used to determine the required sample size for this research. Given the households sample space of 345236, and at 95% confidence level, 3.04 confidence interval and at estimated proportion of 50%, the sample size needed was 1036 households. This sample size was used because the number of households in the metropolis was fairly large; thus, the sample size of 1036 households gave a very large number of households which when carefully selected across the metropolis was representative enough (Table 3.1). Stratified-systematic sampling technique was employed in the selection of the respondents. However, 1020 households responded. The data from the field were eventually subjected to analysis. Table 3.1 contains the population of each of the localities for 1991 projected to 2011.

**Table 3.1: PROJECTED POPULATIONS AND ESTIMATED NUMBER OF HOUSEHOLDS IN KADUNA METROPOLIS BY LOCALITY**

S/NO	LOCALITY	1991 CENSUS	2011 CENSUS PROJECTED	2011 NUMBER OF HOUSEHOLDS	NUMBER OF HOUSEHOLDS SAMPLED
1	Ung/Gwari	10,781	18,729	3,746	11
2	Kawo	37,107	64,464	12,893	39
3	Hayin Banki -1	16,538	28,731	5,746	17
4	Malali	22,677	39,396	7,879	24
5	Ung/Sarki	6,509	11,308	2,262	7
6	Ung/Kanawa	9,732	16,907	3,381	10
7	Ung/Shanu	18,442	32,038	6,408	19
8	Abakpa	13,539	23,521	4,704	14
9	Ung/Rimi	52,717	91,583	18,317	55
10	Kabala Doki	22,694	39,425	7,885	24
11	Kabala Constain	13,566	23,568	4,714	14
12	Doka	53,911	93,657	18,731	56
13	Hayin Banki- 2	17,378	30,190	6,038	18
14	Ung/Dosa	19,658	34,151	6,830	21
15	Badarawa	32,751	56,897	11,379	34
16	Sabon Afaka	991	1,722	344	1
17	Afaka	14,560	25,294	5,059	15
18	Mahuta	434	754	151	1
19	Rigasa	72,483	125,921	25,184	76
20	Nariya	1,813	3,150	630	2
21	Kurmin Mashi	20,026	34,790	6,958	21
22	Tudun Nupawa	39,311	68,293	13,659	41
23	Badiko	16,265	28,256	5,651	17
24	Ung/Sanusi	23,971	41,644	8,329	25
25	Sabo Gari	55,588	96,570	19,314	58
26	Tundun Wada	60,299	104,754	20,951	63
27	Kabala West/Ung-Muazu	37,713	65,517	13,103	39
28	Kakuri/Makera	77,374	134,418	26,884	81
29	Barnawa	32,684	56,780	11,356	34
30	Ung/Television	28,344	49,241	9,848	30
31	Kudandan -2	420	730	146	-
32	Kudandan -1	334	580	116	-
33	Gonin Gora	3,806	6,612	1,322	4
34	Zarma Zarma	326	566	113	-
35	Nasarawa	61,501	106,843	21,369	64
36	Ung/Romi	8,182	14,214	2,843	9
37	Ung/Yelwa	25,186	43,754	8,751	26
38	Ung/Sunday	6,840	11,883	2,377	7
39	Narayi	23,674	41,128	8,226	25
40	Sabon Tasha	27,251	47,342	9,468	28
41	NNPC Staff Quarter	2,656	4,614	923	3
42	Ung/Boro	494	858	172	1
43	Pantuta	1,396	2,425	485	1
44	Bayan Dutse	303	526	105	-
45	Ung/Na Maigero	394	684	137	-
46	Ung/Maigero	302	525	105	-
47	Janruwa	255	443	89	-
48	Kamazo	447	777	155	1
	<b>TOTAL</b>	<b>993,623</b>	<b>1,726,173</b>	<b>345,236</b>	<b>1,036</b>

Source: NPC, 1991; Author's Fieldwork, 2011

The formula used for the population projection is as follows:

$$P_t = P_o (1 + r)^t \dots\dots\dots (2)$$

where

$P_t$  = future population or population at the end of the period

$P_o$  = present population

1 = constant

r = the rate of growth of the population

t = time or period of projection (in years)

The lower limit of 5 persons per household was applied from the national household range of 5-7 (NPC: 1991) to derive the average number of households in each of the localities within the metropolis. The lower limit of household size (5 persons) was used to generate a larger number of households from the total population figure from which samples were taken. The census tracts (Localities in Table 3.1) were used as the spatial units from which the samples were drawn. Systematic sampling was employed to pick the samples from each tract. This was achieved by knowing the number of households within each tract, determining the number of the respondents that was needed in each tract and selecting the first household in a tract at random and thereafter every household in the tenth building was selected.

### **3.5 Data Collection**

Research assistants (RAs) were engaged for data collection. The RAs were divided into two groups (seven in a group) with each group having two females. This structuring is essential because of the cultural space. The female RAs were made to enter into houses where entry is forbidden for men (“baa-shiga”) to interview the respondents while their male counterparts waited for them outside the house. Each group was answerable to a supervisor who coordinated their activities on a daily basis. Data collection lasted for two weeks. The questionnaire was amongst others designed to include information on the

following: sex, income, age, educational status, marital status, present address, town of origin, and place of birth, question to determine whether they have changed residence and reasons for change of residence, and their jobs amongst others (see Appendix 1). The questionnaire was designed to include both structured and unstructured questions. During the period of data gathering, the RAs were made to fill the questionnaire for the respondents who could not read and write. Additional information (Appendix 2) was obtained from four Estate Agents in the city to reveal the change in the residences of their clients. During the survey, some of the households were not responsive; they were substituted by the next available households. In addition, few of the respondents refused to give their age; we tackled this problem through retrogressive questioning of events that occurred during their birth, hence, their ages were matched with those events.

### **3.6 Data Analysis**

Data analysis involved a systematic examination of data in order to understand patterns and to identify cause and effect relationships between the dependent and independent variables. Residential mobility (the dependent variable) was seen as a function of independent variables of household characteristics: religion, race/tribe, age, sex, marital status, household size, income, educational status and job/employment. Analysis of data was directed at testing the research hypotheses.

#### **3.6.1 The Effect of Distance on Residential Mobility**

The interest here was to determine the relationship between the volume of residential mobility and distance from points of origin. Pearson Product Moment Correlation Coefficient ( $r$ ) was used to test the hypothesis. Data were generated on the number of mover household's and distances in kilometers from points of origin to points of destination. Distance is the independent variable ( $x$ ) while the number of mover household's is the dependent variable ( $y$ ). The correlation took into consideration the points of origin and destination of the mover household's in the determination of the distance(s) in kilometers between the wards.

### 3.6.2 The Effect of Socio-Economic and Cultural Factors on Residential Mobility

The interest here was to determine whether socio-economic and cultural factors affect residential mobility (dependent variable) in Kaduna metropolis. This was done by using the Statistical Package for the Social Sciences (SPSS) to run logistic regression on the relevant variables. The independent variables are age, education, occupation, income, marital status, household size, tribe and religion represented by their variable labels q5, q7, q8, q9, q10, q11c, q12 and q13 respectively (see Appendix 3). SPSS limits variable names to eight characters; hence, our variables are labeled along their case number on the questionnaire for easy identification. Logistic regression is suitable for this exercise because it predicts the probability that an observation falls into one of two categories of a dichotomous dependent variable based on one or more independent variables that can be either quantitative or categorical. The dependent variable which is residential mobility is measured on a dichotomous scale (moved: “yes” or “no”: variable label q21). The binary variable 1 means moved and 0 means not moved. The independent variables age, income and household size are quantitative while education, occupation, marital status, tribe and religion are categorical.

The Logistic Regression model was used to test the effect of socio-economic and cultural factors on residential mobility. The logistic regression equation is shown in equation 3

$$Y = \frac{\exp^{(a+b_1 x_1 + b_2 x_2 + b_3 x_3 + \dots + b_n x_n)}}{1 + \exp^{(a+b_1 x_1 + b_2 x_2 + b_3 x_3 + \dots + b_n x_n)}} \dots \dots \dots (3)$$

Where

Y = the probability that the dependent variable is in a particular category and in this case moved or not moved

exp = the base of natural logarithms (2.71828)

a = the constant of the equation

b = the coefficient of the independent variables and

$x_i$  = the independent variables ( $x_1, x_2, x_3, \dots, x_n$ )

whereby  $x_1$ =age of respondents,  $x_2$ =income,  $x_3$ =household size,  $x_4$ =non-formal education,  $x_5$  = primary certificate,  $x_6$ =OND/NCE,  $x_7$ =Graduate/HND,  $x_8$ =other forms of education,  $x_9$ =civil servant,  $x_{10}$ =company worker,  $x_{11}$ =self employed,  $x_{12}$ =unemployed,  $x_{13}$ =other type of jobs,  $x_{14}$ =single,  $x_{15}$ =married,  $x_{16}$ =divorced,  $x_{17}$ =widowed,  $x_{18}$ =Hausa tribe,  $x_{19}$ =Yoruba tribe,  $x_{20}$ =Ibo tribe,  $x_{21}$ =Fulani tribe,  $x_{22}$ =other tribes,  $x_{23}$ =Christianity,  $x_{24}$ =Islam,  $x_{25}$ =traditional religion and  $x_{26}$ =other types of religion. SPSS was used to conduct the regression statistics.

### 3.6.3 Neighbourhood’s Influence on Residential Choice

The interest here was to determine neighbourhood’s influence on residential choice. This was done by subjecting the neighbourhood characteristics of religion (Christianity and Islam) to Chi-Square statistical test in the four Local Government Areas of the metropolis.

The Chi- Square statistic is depicted as

$$\chi^2 = \sum \sum \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \dots\dots\dots (4)$$

Where

O = Observed Value

E = Expected Value

### 3.6.4 Pattern of Residential Mobility

The interest here was to determine the pattern of residential mobility in Kaduna metropolis. Residential mobility in the metropolis resulted into residential segregation. Measuring residential segregation within a given geographical area entails two basic operations: (i) defining the neighbourhoods within which individuals live and (ii) quantifying the extent to which the distribution of the social attribute of interest (for

example, social class) varies across neighbourhoods (Reardon and O’Sullivan, 2004). Here, we accounted for residential segregation within the metropolis based on religion using the multigroup dissimilarity index. The multigroup dissimilarity index describes the degree to which two or more population groups are similarly distributed among sub areas. The dissimilarity index measures evenness (how evenly the units are spatially distributed), and is measured in terms of the percentage of a group that would have to change residence for each neighborhood to have the same distribution (Massey, 1990; Massey *et al.*, 1994; Adams, 2006). The values of multigroup dissimilarity index range from 0 (no segregation) to 1 (complete segregation).

The formula for multigroup dissimilarity index (from Reardon and Firebaugh, 2002) is:

$$D = \frac{\sum_{m=1}^M \sum_{j=1}^J t_j \left| \pi_{jm} - \pi_m \right|}{2TI} \dots\dots\dots (5)$$

Where

D is dissimilarity index

T is total number of respondent households in the metropolis

M is the number of religious group in the metropolis

J is the number of sub areas or wards in the metropolis,

t<sub>j</sub> is number of households in each sub area or ward,

π<sub>m</sub> is the proportion of each religious group in the population

π<sub>jm</sub> is the proportion of each religious group in each ward

I is the Simpson’s Interaction index, given by

$$I = \sum_{m=1}^M \pi_m (1 - \pi_m) \dots\dots\dots (6)$$

The parameters in equation 6 are as in equation 5

The traditional indices of residential segregation equate the neighbourhoods within which individuals live with the administrative units (for example, the census tracts) into which the geographical area of interest is divided (Reardon and O'Sullivan, 2004; Pisati, 2009). Iceland and Scopilliti (2008) and Knox and Pinch (2010) noted that one of the most widely used methods of quantifying the degree to which a group is residentially segregated is the index of dissimilarity, which is analogous to the Gini index of inequality and which produces a theoretical range of values from 0 (no segregation) to 100 (complete segregation). In order to test the hypothesis that there is residential segregation along sectarian lines within Kaduna metropolis, Analysis of Variance Statistic was employed.



## **CHAPTER FOUR**

### **SOCIO- ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF INTRA URBAN MOVERS**

In this chapter, socio-economic and demographic characteristics of intra urban movers are analyzed. This is done because intra-urban residential mobility is related with education, occupation, income, religion race, age, sex, marital status and family size of the urban dwellers. The intention is to determine the extent to which these attributes affect residential mobility within the metropolis. The detail account of how these attributes affect residential mobility in the metropolis in the various wards and the four Local Government Areas of Kaduna metropolis is shown in Appendix 4.

#### **4.1 Socio-Economic Status of Intra-Urban movers**

Intra-urban residential mobility is closely related with education, occupation and income level of urban dwellers (Poppe, 2013). However, these three characteristics are neither independent nor mutually exclusive. Often a person with high education has good income and is engaged in an occupation of high status, while low income often goes with low status jobs and low educational levels. However, there is the need to recognize the fact that a person with little education may acquire great wealth in business while a highly educated person sometimes fails to find a good job. Keeping these conditions in mind, this section will examine the relationship between education, occupation, income and residential mobility in Kaduna metropolis.

##### **4.1.1 Education and Residential Mobility**

Education plays an important role in intra-urban residential mobility. It is generally believed that mobility will increase with education, since highly educated people may have access to more information about potential destinations and have more resources to carry out a move and may be better positioned to take advantage of economic opportunities in other places. Investigations of the independent effect of education using mobility rates report that more education is either associated with higher mobility (Brown

and Kain 1972; Quigley and Weinberg 1977) or it has no effect (Long 1972; Morrison 1972; Speare, Goldstein and Frey, 1974). Gbakeji and Rilwani (2009) noted that people of high educational attainment are status conscious. They often seek for residential locations that satisfy their desires for prestigious dwellings and neighbourhoods comparable to their jobs, their incomes as well as their personality. Residential location is strongly linked to education (Cordes, Schwartz, Stiefel and Zabel, 2015). Table 4.1 shows the educational status of mover households in Kaduna metropolis. In Kaduna North Local Government Area (KDNLGA), 108 respondents (85.04 percent) have education above the primary school level. Specifically, 35 (27.56 percent) have secondary education, 36 (28.35 percent) have Ordinary National Diploma (OND) or Nigeria Certificate in Education (NCE), while 29 (22.83 percent) and 8 (6.30 percent) are educated to Higher National Diploma (HND)/University and Postgraduate levels respectively. This is contradictory to the work of Brown and Kain (1972) and Quigley and Weinberg (1977) which found that the more the educational attainment of people the higher their residential mobility. However, majority of the movers have at least secondary school education.

In Kaduna South Local Government Area (KDSLGA), 39 respondents (21.31 percent) did not obtain formal education, 24 (13.11 percent) have primary education while 120 (65.58 percent) have been educated above the primary school level. This has similar trend to that in Kaduna North LGA where the educated respondents are more in number than the uneducated using at least secondary school education as a bench mark. In Chikun Local Government Area (CLGA), 81 respondents (75.7 percent) have been educated above the primary school level. Specifically, 37 (34.58 percent) have secondary education, 20 (18.69 percent) have OND or NCE, while 17 (15.89 percent) and 7 (6.54 percent) are educated to HND/University and Postgraduate levels respectively.

**Table 4.1: Educational Status of Mover Households in Kaduna Metropolis**

<i>Education</i>	<i>KDNLGA</i>	<i>KDSLGA</i>	<i>CLGA</i>	<i>ILGA</i>	<i>Total</i>	<i>Percentage</i>
Non formal	12 (9.45%)	39 (21.31%)	11 (10.28%)	17 (34.69%)	79	16.95
Primary	7 (5.51%)	24 (13.11%)	15 (14.02%)	7 (14.29%)	53	11.37
Secondary	35 (27.56%)	42 (22.95%)	37 (34.58%)	15 (30.61%)	129	27.70
OND/NCE	36 (28.35%)	40 (21.86%)	20 (18.69%)	7 (14.29%)	103	22.10
Grad/HND	29 (22.83%)	32 (17.49%)	17 (15.89%)	2 (4.08%)	80	17.16
Post Grad	8 (6.30%)	6 (3.28%)	7 (6.54%)	1 (2.04%)	22	4.72
<b>Total</b>	<b>127 (100%)</b>	<b>183 (100%)</b>	<b>107 (100%)</b>	<b>49 (100%)</b>	<b>466</b>	<b>100</b>

Source: Households Survey, March, 2011

In Igabi Local Government Area (ILGA), 25 respondents (51.02 percent) are educated above the primary school level. Specifically, 15 (30.61 percent) have secondary education, 7 (14.29 percent) have OND/NCE, while 2 (4.08 percent) and 1 (2.04 percent) are educated to HND/University and Postgraduate levels respectively. The data for Igabi LGA shows that about 51 percent of the sample population has been educated above primary school level while about 49 percent of the respondents have not been educated beyond primary school level. This 51/49 distribution could be why Long (1972), Morrison (1972), and Speare *et al.* (1974) were indifferent about the effect educational status has on residential mobility.

Generally, the educational background of the mover households in Kaduna metropolis reveals a high level of literacy among the sample population. For example, Table 4.1 shows that 334 respondents (71.68 percent) have been educated above the primary school level in the metropolis. Specifically, 129 (27.70 percent) have secondary education 103 (22.10 percent) have Ordinary National Diploma or Nigeria Certificate in Education, while 80 (17.16 percent) and 22 (4.72 percent) are educated to Higher National Diploma/University and Postgraduate levels respectively. A conclusion that can be drawn from this finding is that most of the mover households in the metropolis can read and write.

#### **4.1.2 Occupation and Residential Mobility**

Kaduna metropolis is an administrative and commercial centre with modest industrial activity. In order to boost and stabilize electricity in the metropolis, the Federal Government of Nigeria has connected the metropolis to the newly built Gurara dam Hydro Electricity Plant. The metropolis has a large number of government offices and many other offices. Kaduna metropolis is also an important educational centre with tertiary institutions such as the Nigerian Defence Academy (the only military university in West Africa), Kaduna State University and Kaduna Polytechnic. Also, in the metropolis, are the offices of the National Board for Technical Education (NBTE) and National Teachers Institute (NTI). There are numerous private and government owned

primary and secondary schools in the metropolis. Kaduna metropolis is an important wholesale and retail centre. Many Banks, insurance and other financial institutions and industries are there. Some of the industries in the metropolis include Peugeot Automobile Nigeria Ltd (PAN) NOCACCO Wire and Cable industry, Queensway Aluminum, Breweries, Textile industries, Northern Noodles, Pipeline Product and Marketing Company (PPMC) and Kaduna Refining and Petrochemical Company (KRPC).

Table 4.2 shows the occupational distribution of the mover households in Kaduna metropolis. The occupational distribution of the mover households reflects the economic base of the neighbourhoods. It is evident from the table that a sizeable proportion of the residents are self employed and civil servants. This could largely be linked to the commercial nature of the city and its administrative functions. For instance, in Kaduna North LGA, 41.73 percent of the respondents are self employed while the civil servants are 45.67 percent. In the Kaduna South LGA, the self employed are 45.90 percent of the respondents and the civil servants are 34.97 percent. This result is replicated in Chikun LGA where the self employed are 46.73 percent of the movers and 28.04 percent are civil servants and Igabi LGA where the self employed constitute 59.18 percent of the movers and 22.45 percent civil servants. It is necessary to evaluate these results. Sociologists, using mobility rate analysis, found that accessibility and work related reasons provide impetus, though minor, for residential mobility (Quigley and Weinberg 1977; Speare *et al.*, 1974; Thibeault, Kaiser, Butler and McAllister, 1973; Zimmer 1973; Stegman 1969; Goldstein and Mayer, 1964). This impetus might be one of the reasons that made Kaduna North LGA that houses the Federal Secretariat and Kaduna State Government Secretariat to have a higher percentage of movers as civil servants (45.67 percent). The situation is different in Kaduna South LGA, Chikun LGA and Igabi LGA where larger proportions of movers are self employed.

**Table 4.2: Occupational Distribution of Mover Households in Kaduna Metropolis**

<i>Occupation</i>	<i>KDNLGA</i>	<i>KDSLGA</i>	<i>CLGA</i>	<i>ILGA</i>	<i>Total</i>	<i>Percentage</i>
Civil Servant	58 (45.67%)	64 (34.97%)	30 (28.04%)	11 (22.45%)	163	34.9
Company/ Industrial worker	9 (7.09%)	24 (13.12%)	19 (17.76%)	3 (6.12%)	55	11.8
Self Employed	53 (41.73%)	84 (45.90%)	50 (46.73%)	29 (59.18%)	216	46.4
Unemployed	6 (4.72%)	11 (6.01%)	8 (7.47%)	6 (12.25%)	31	6.7
Others	1 (0.79%)	- (0%)	- (0%)	- (0%)	1	0.2
<b>Total</b>	<b>127 (100%)</b>	<b>183 (100%)</b>	<b>107 (100%)</b>	<b>49 (100%)</b>	<b>466</b>	<b>100</b>

Source: Households Survey, March, 2011

The company and/or the industrial workers also account for a substantial proportion of movers in the metropolis. For instance, in the Kaduna North LGA, the respondents that are company workers consist of 7.09 percent, in Kaduna South LGA, the company workers are 13.12 percent, in Chikun LGA, 17.76 percent and in Igabi LGA, the company workers account for 6.12 percent. More company workers are found at Kaduna South and Chikun LGAs compared to Kaduna North and Igabi LGAs. This is because Kaduna South and Chikun LGAs are the industrial areas of the metropolis. Most of the industries earlier mentioned are situated in these two LGAs.

There are relatively few unemployed amongst the movers in the four LGAs of the metropolis. This could be as a result of insufficient financial resources to change house, because rent for new accommodation has to be paid coupled with the fact that a house-owner will not like to lease his/her property to a jobless person who might find it difficult to pay subsequent house rents after the first payment is made. The recent concerted efforts of Kaduna State Government to construct new roads linking Kaduna South with the North through Mahuta and the rehabilitation of the dilapidated roads in the metropolis have continued to facilitate movement of residents from their homes to their work places and vice-versa. This notwithstanding, the pattern of the occupational distribution of the residents in the metropolis clearly reflects the economic base of the metropolis.

#### **4.1.3 Income and Residential Mobility**

One of the generators of intra-urban movement is the economic condition of the households. When the economic condition of a person improves, he moves to a better and larger house. He searches for better neighbourhoods where facilities are available (Ahmed, 1995; Gbakeji and Rilwani, 2009). The economic means of households shapes and reinforces population distribution given that low income movers will be economically excluded from neighbourhoods and housing that are more expensive (Smith, Finney, Halfacree and Walford, 2015). Numerous studies have been conducted to find the relationship between income and residential mobility. It must however be noted

that income and education are two demographic characteristics whose effects are difficult to disentangle. In a previous study, Abu-Lughod and Foley (1960) found that movers have lower incomes than non-movers. Pickvance (1973), using mobility rates and Kain and Quigley (1975), using regression analysis, found that mobility decreases with income. However, Fredland's (1974) results suggest a slight increase in mobility with income, while Brown (1975) reported that rising income increases mobility.

Table 4.3 shows the income of movers in Kaduna metropolis. An analysis of the income of movers in the Kaduna North LGA reveals that the low income group with salary of ₦18000 (National Minimum Wage) and below, and the high income group of ₦55000 and above have the same rate of mobility. Each group accounts for 25.20 percent of the movements in the Local Government. The low-income group and the high income group in this local government account for about half (50 percent) of the residential mobility, while the middle income group (₦19000 to ₦54000) accounts for the remaining half of the mobility. There is high rate of mobility for the low-income group (₦18,000 and less) in Kaduna South LGA with 37.70 percent of the movers falling into this category. In Nigeria, ₦18,000 is the current minimum wage for workers. However, some establishments and organizations are yet to comply, thereby paying their employees monthly salaries that are below the minimum wage. Crowley (2003) explains that moves are common in low-income families because of pressures to share housing, be near family members, be near temporary employment and avoid creditors among other factors. He explains further that the limited availability of housing that the low income households can afford contributes to housing instability resulting in frequent moves and in some cases period of homelessness. The next group of wage earners amongst the movers in the Kaduna South LGA are those in the income bracket of ₦19,000 to ₦36,000. This set of people account for 25.14 percent of the movers.



**Table 4.3 Income of Movers in Kaduna Metropolis**

<i>Income (₦) Per Month</i>	<i>KDNLGA</i>	<i>KDSLGA</i>	<i>CLGA</i>	<i>ILGA</i>	<i>Total</i>	<i>Percentage</i>
≤ 18000	32 (25.20%)	69 (37.70%)	50 (46.73%)	16 (32.65%)	167	35.84
19000-36000	40 (31.49%)	46 (25.14%)	30 (28.04%)	22 (44.90%)	138	29.61
37000-54000	23 (18.11%)	46 (25.14%)	16 (14.95%)	9 (18.37%)	94	20.17
≥ 55000	32 (25.20%)	22 (12.02%)	11 (10.28%)	2 (4.08%)	67	14.38
<b>Total</b>	<b>127 (100%)</b>	<b>183 (100%)</b>	<b>107 (100%)</b>	<b>49 (100%)</b>	<b>466</b>	<b>100</b>

Source: Households Survey, March, 2011

The mover households that earn between ₦37,000 and ₦54,000 also account for 25.14 percent of the movers while the high income earners of ₦55,000 and above constitute 12.02 percent of the mover households. This confirms the work of Pickvance (1973), using mobility rates, and Kain and Quigley (1975), using regression analysis that mobility decreases with income.

The income of movers in Chikun LGA replicates the situation in Kaduna South LGA with more movers found among the minimum wage group. The low-income households contribute 46.73 percent to the mobility in Chikun LGA. Crowley (2003) gave reasons that could be responsible for higher mobility of the low income earners as discussed earlier. The wage earners in the category of ₦19,000 to ₦36,000 account for 28.04 percent, ₦37,000 to ₦54,000 account for 14.95 percent, while the high income earners of ₦55,000 and above account for 10.28 percent of the mobility. This again confirms the work of Pickvance (1973), and Kain and Quigley (1975) which found that mobility decreases with income. The situation in Igabi LGA is slightly different. There is a fairly large number of movers in the low income group of ₦18,000 and below, which accounts for 32.65 percent of the moves in the Local Government. However, there is a higher proportion of movers in the category of ₦19,000 to ₦36,000 income earners. This middle income group accounts for 44.90 percent of the moves. Brown and Kain (1972) found mobility to be highest in the middle income range, a result supported by Weinberg's (1975) regression analysis and thereafter, the contribution to the mobility decreases with income. For instance, the wage earners in the category of ₦37,000 to ₦54,000 account for 18.37 percent, while the income earners from ₦55,000 and above account for 4.08 percent.

#### **4.1.4 Effect of Socio-Economic and Cultural Factors on Residential Mobility**

A logistic regression analysis was conducted to determine whether socio-economic and cultural factors affect residential mobility in Kaduna metropolis. (see Case Processing Summary, Appendix 3) using age, education, occupation, income, marital status, household size, tribe and religion as independent variables. The result of the analysis was

statistically significant, indicating that the variables as a set reliably distinguished between “movers” and “non movers” in Kaduna metropolis (chi-square = 59.152,  $p < 0.000$  with  $df = 27$ ) [see Omnibus Tests of Model Coefficients, Appendix 3]. SPSS provides two “pseudo R-squared statistics” that were interpreted in a way similar to that in multiple regressions. It shows that all the independent variables in the logistic model together account for between 7.3% and 9.8% of the variance in “moved” status (see Model Summary, Appendix 3). This shows a low level of explanation by the variables but does not reflect the extent to which each of the variables explains the mobility. The strength of the explanation could sometimes be weak because we are dealing with human behaviours.

Table 4.4 gives coefficients and the Wald statistic and associated degrees of freedom and probability values for each of the independent variables. The simplest way to assess Wald is to take the significance values and if less than .05 the statistic shows that the variable does make a significant contribution. In this case, we note that while the “p” values for all the other variables in the model are higher than .05, religion as a set contributed significantly to the model ( $p = .012$ ) and a Wald (10.980). The “B” column in the table gives the coefficients for each of the independent variables in the model. For instance, the negative coefficients for education of respondents indicates that the odds of residential mobility declines with additional unit sample on education of respondents, while the positive coefficients for occupation of respondents indicates that the odds of residential mobility increases with additional unit sample on occupation of respondents. The Exp (B) column in the table presents the extent to which raising the corresponding measure of an independent variable by one unit influences the odds ratio. This study has shown that religion is a significant factor ( $p = .012$ ) of residential mobility in Kaduna metropolis.

Table 4.4: Variables in the Equation

	B	S.E	Wald	Df	Sig.	Exp(B)
Step 1 <sup>a</sup> q5age	.009	.009	1.131	1	.288	1.009
q9income	.000	.000	.072	1	.788	1.000
q11chsiz	-.035	.021	2.836	1	.092	.966
q7edu			13.662	7	.058	
q7edu (1)	-21.924	19924.904	.000	1	.999	.000
q7edu (2)	-21.661	19924.904	.000	1	.999	.000
q7edu (3)	-21.436	19924.904	.000	1	.999	.000
q7edu (4)	-22.867	19924.904	.000	1	.999	.000
q7edu (5)	-20.939	19924.904	.000	1	.999	.000
q7edu (6)	-21.156	19924.904	.000	1	.999	.000
q7edu (7)	-21.305	19924.904	.000	1	.999	.000
q8occup			.9078	5	.106	
q8occup (1)	21.315	28296.945	.000	1	.999	1.808
q8occup (2)	21.153	28296.945	.000	1	.999	1.537
q8occup (3)	20.882	28296.945	.000	1	.999	1.173
q8occup (4)	20.884	28296.945	.000	1	.999	1.175
q8occup (5)	19.427	28296.945	.000	1	.999	2.736
q10mstat			3.063	4	.547	
q10mstat (1)	.124	1.354	.008	1	.927	1.133
q10mstat (2)	.859	1.250	.472	1	.492	2.361
q10mstat (3)	.756	1.270	.354	1	.552	2.129
q10mstat (4)	.556	1.300	.183	1	.669	1.743
q12tribe			2.477	5	.780	
q12tribe (1)	.351	.522	.453	1	.501	1.421
q12tribe (2)	.548	.462	1.405	1	.236	1.730
q12tribe (3)	.553	.554	.997	1	.318	1.739
q12tribe (4)	.324	.455	.505	1	.477	1.382
q12tribe (5)	.364	.492	.546	1	.460	1.439
q13relig			10.980	3	.012	
q13relig (1)	-.149	1.493	.010	1	.920	.862
q13relig (2)	-.763	1.498	.260	1	.610	.466
q13relig (3)	.813	1.888	.186	1	.667	2.255
Constant	-.479	34605.290	.000	1	1.000	.619

Source: Households Survey SPSS Output, 2011

## **4.2 Demographic Characteristics of Intra-Urban Movers**

In this section, the demographic characteristics of intra urban movers are analyzed. This is done because demographic characteristics influence residential mobility. The age, sex, marital status and family size of the movers in each of the Local Government Areas are carefully analyzed.

### **4.2.1 Age**

Age is an essential predictor in models of residential mobility. It is therefore necessary for the age group of movers in each of the four LGAs to be analyzed. Table 4.5 shows the age group of movers in Kaduna metropolis. The respondents are grouped in 5 years age intervals. In Kaduna North LGA, the highest movers were in the age group of 31 to 35 years. This group accounts for 27.50 percent. This is the age when most young men in the developing countries of the world try to settle down with a partner after very long years of educational pursuit and having a job at hand, deem it fit to go and search for a house and settle down with a wife. The next on the high rank of movers is the age category 36 to 40 years (21.30 percent). These are young families. This confirms Ahmed's (1995) observation that younger households move more frequently than older households. The movers in the category 26 to 30 years contribute 17.30 percent of the moves. Though, this is high, it is not as high as the mobility in the age groups of 31 to 35 years and 36 to 40 years. This is because in this part of the world, most people in the age category of 26 to 30 years are dependants. However, in the developed world, most people above 18 years are independent. In Nigeria, at 18 years of age, most people are in secondary schools and at best in tertiary institutions such as universities, polytechnics or colleges of education. However, few people that learn trades or crafts are independent at this stage. Ahmed (1995) designates the age category 21 to 40 years as child-bearing and child rearing stage. In his study of residential mobility in Bahawalpur City of Pakistan, he found that the maximum number of movements is made in the age category of 21 to 40 years. During this period 65.3 percent of the households moved. This is similar to what is observed in the Kaduna North Local Government Area of Kaduna metropolis where 66.10 percent moved.

**Table 4.5: Age Group of Movers in Kaduna Metropolis**

<i>Age group</i>	<i>KDNLGA</i>	<i>KDSLGA</i>	<i>CLGA</i>	<i>ILGA</i>	<i>Total</i>	<i>Percentage</i>
≤ 20	- (0%)	- (0%)	3 (2.80%)	1 (2.04%)	4	0.86
21-25	- (0%)	5 (2.70%)	7 (6.54%)	- (0%)	12	2.58
26-30	22 (17.30%)	25 (13.70%)	8 (7.48%)	5 (10.20%)	60	12.88
31-35	35 (27.50%)	25 (13.70%)	18 (16.82%)	4 (8.16%)	82	17.59
36-40	27 (21.30%)	25 (13.70%)	15 (14.02%)	11 (22.45%)	78	16.74
41-45	11 (8.70%)	22 (12.00%)	19 (17.76%)	4 (8.16%)	56	12.01
46-50	11 (8.70%)	37 (20.20%)	13 (12.15%)	7 (14.29%)	68	14.59
≥ 51	21 (16.50%)	44 (24.00%)	24 (22.43%)	17 (34.70%)	106	22.75
<b>Total</b>	<b>127 (100%)</b>	<b>183 (100%)</b>	<b>107 (100%)</b>	<b>49 (100%)</b>	<b>466</b>	<b>100</b>

Source: Households Survey, March, 2011

This is a confirmation that youths are vibrant in residential mobility. In Kaduna North Local Government Area, the movers in the age category of 41 to 45 years are 8.70 percent and same for the movers in the age category of 46 to 50 years (Table 4.5). This confirms the observations of Quigley and Weinberg (1977) that residential mobility is inversely related to the age of household head. This is because at this age, a household is expected to have a settled family life and be in the process of building its own house. An attempt to move at this stage in some cases will be movements to personal houses. However, the observations of Quigley and Weinberg (1977) is not in conformity with the mobility of the elderly (51 years and above) in Kaduna North Local Government Area. There is large number of movers in this age group. The movers in this category make up 16.50 percent of the moves. What informed the use of 51 years and above as the age of the elderly is the life expectancy at birth in Nigeria which is 52.05 years. However, for the male it is 48.95 years while for the female it is 55.33 years (Nigeria Demographic Profile, 2012). This age group according to Ahmed (1995) is the post child and late life stage. The children might have left to form their own families, hence, the elderly search for smaller apartments that can easily be maintained, and some, having retired from their place of work may also retire to their personal houses, as continuous payment of house rents may no longer be feasible for them after retirement from work. It is of interest to observe that there is no residential mobility below the age of 26 years in the household sample. At 25 years of age, very few people are independent and hardly take decisions on their own. There are many jobless young people in the society resulting in youth restiveness which poses security challenges to the nation. This is at variance with what obtains in the developed countries of the world, where at this same age; many youths are in their own personal houses, made possible through mortgage facilities.

In the Kaduna South Local Government Area, the highest movers are in the age category of the elderly (Table 4.5). This is the group above 51 years of age. This group accounts for 24 percent of the movers in Kaduna South Local Government Area. It is expected that at old age, there should be fairly low residential mobility but this is at variance with the expected. The observation contradicts the view of Johnston (1971) that the desire for

movement declines above the age of 60 years; however, this could be because the age of the elderly for this study is taken from age of 51 years. Ahmed (1995) observes that in the late stage, majority of the households (father and mother) live with their sons as dependants and are relatively immobile. This is why Animashaun (2011) posits that the reason for and the pattern of residential mobility are so complicated that they make it difficult for anybody to predict. The factors that influence residential mobility in an area may be completely different from that of another area. Hence he suggested the need to study residential mobility in several cities. The proportion of movers across the age categories in the Kaduna South Local Government Area are almost alike, with the age category of 26 to 30 years contributing 13.70 percent of movers, 31 to 35 years contributing 13.70 percent of movers, 36 to 40 years, also 13.70 percent of movers. The age group of 41 to 45 years accounts for 12 percent while 46 to 50 years accounts for 20.20 percent. The distribution of movers across the age categories can largely be explained by the peculiar situation in Kaduna metropolis. The metropolis has been affected by ethno-religious crises over a period of many years (Ajibuah, 2008). Most non-Hausas and non-Muslims are forced to move to this LGA irrespective of age. Safety of lives and properties is a priority to the movers in this LGA. This movement can be categorized as forced moves; hence, age of movers as a factor of mobility is not very important. It was observed that 2.70 percent of movers in Kaduna South Local government Area are made up of households below the age of 25 years. This is because most people of this age group are dependents in Nigeria.

Chikun is another Local Government Area of Kaduna metropolis. In this Local Government Area, the proportion of movers across the age categories is shown in table 4.5. The 31 to 35 years age group accounts for 16.82 percent of the moves, 36 to 40 years accounts for 14.02 percent, 41 to 45 years accounts for 17.76 percent, 46 to 50 years accounts for 12.15 percent, while the elderly group, 51 years and above accounts for 22.43 percent of the mobility. This is against all expectations as the elderly are expected to be less mobile. Angelini and Laferrere (2011) and Quigley and Weinberg (1977) reported the inverse relationship between age of household head and mobility. Angelini



and Laferrere (2011) in their study of residential mobility of the European elderly found that mobility of the elderly is low. Different results emanating from various studies on residential mobility suggest the need for more studies of residential mobility, as peculiar situations will continue to unfold. The situation in Chikun Local Government Area of Kaduna metropolis is peculiar, just like the situation in Kaduna South Local Government Area. The ethno-religious crises in the metropolis ignite forced moves that propel non-Muslims especially the non-Hausa/Fulani ethnic groups to move into this Local Government Area irrespective of age of heads of households.

In Igabi Local Government Area of the metropolis, only Ward 7 falls in the area of study. The situation in Igabi Local Government Area is similar to that in Kaduna South and Chikun Local Government Areas. The elderly (age 51 years and above) accounts for the majority of the moves, with 17 households out of the 49 constituting 34.70 percent of the movers, while the mobility for age 36 to 40 years is also high, with eleven households accounting for 22.45 percent of the movers. Five households are in the age category of 26 to 30 years, accounting for 10.20 percent of the movers, four households in the age category of 31 to 35 years, accounting for 8.16 percent of the movers, four households in the age category of 41 to 45 years, accounting for 8.16 percent of the movers, seven households in the age category of 46 to 50 years accounting for 14.29 percent of the movers, while one household was in the age bracket of 20 years and below, accounting for 2.04 percent of the movers. Precisely, 40.81 percent of the movers are in the age category of 26 to 40 years. This supports the claim by Ahmed (1995) that the largest number of movements is made in the age category of 21 to 40 years.

In Kaduna metropolis, residential mobility was experienced in all the age categories. This shows that household's life cycle is not enough for the explanation of residential mobility in Kaduna metropolis. An in-depth analysis of the residential mobility in the metropolis reveals the importance of crises as a major factor of residential relocation. Residents determine areas that are safe and relocate there irrespective of age.

#### 4.2.2 Sex

In Nigeria, the head of the family is usually male. Therefore, the decision to change residence is mostly taken by men. However, the advice and desire of the womenfolk particularly wives, mothers and daughters carry some weight in decision making. Under normal circumstances, they are not only consulted, but their wishes are also respected. The survey of intra-urban movers by sex (Table 4.6) conducted in the Kaduna metropolis shows that in Kaduna North LGA about 90 percent of the households which changed residence were headed by males and 10 percent by females. Likewise, in the Kaduna South LGA, about 87 percent of the families which changed residence were headed by males and 13 percent by females. In Chikun LGA, about 95 percent of the households which changed residence were headed by males while 5 percent were headed by females. The situation in Igabi LGA is not different. About 90 percent of the households that changed residence were headed by males, while 10 percent were headed by females.

The distribution of intra urban movers by sex as shown in Table 4.6 is expected. Gbakeji and Rilwani (2009) in their analysis of residents' socio-economic characteristics and the residential mobility process in Warri found that 82.8 percent of the mover households are headed by males while 17.2 percent are headed by females. The reasons for this are not farfetched. Traditionally and scripturally, a man is the head of a household. The term 'household' refers to a group of persons who live together and share living expenses. These include husband, wife and children and other people such as relatives and/or servants living with them. The women that head the mover households are widowed, divorced or unmarried.

**Table 4.6: Intra-urban Movers by Sex in Kaduna Metropolis**

<i>SEX</i>	<i>KDNLGA</i>	<i>KDSLGA</i>	<i>CLGA</i>	<i>ILGA</i>	<i>Total</i>	<i>Percentage</i>
Male	114 (89.80%)	160 (87.43%)	102 (95.30%)	43 (87.76%)	419	89.91
Female	13 (10.20%)	23 (12.57%)	5 (4.70%)	6 (12.24%)	47	10.09
Total	127 (100%)	183 (100%)	107 (100%)	49 (100%)	466	100

Source: Households Survey, March, 2011

### 4.2.3 Marital Status

Marital status is an important factor of residential mobility. Alkay's (2011) study of residential mobility pattern in the Istanbul metropolitan area in Turkey includes marital status change as one of the factors for analysis. van der Vlist *et al.* (2001) observes that changes in households are probably the most important reason families move. Likewise, Clark and Huang (2003) studied mobility in British housing markets and observe that marital status change amongst other factors plays important roles in moving within housing markets in the United Kingdom. Table 4.7 shows the marital status of movers in Kaduna North LGA, Kaduna South LGA, Chikun LGA and Igabi LGA respectively. In Kaduna North LGA, the married are about 68 percent of the movers, singles are about 24 percent, divorced constitute less than 1.0 percent and widowed are about 8.0 percent. In Kaduna South LGA, the movers that are single are almost 17 percent, the married are about 74 percent, the divorced are less than 2.0 percent and the widowed are about 8.0 percent. In Chikun LGA, the movers that are single are about 24 percent, the married are about 73 percent, the widowed account for 3.0 percent of the movers while there is no divorcee. In Igabi LGA, the mover households that are single are about 4.0 percent, the married, about 90 percent, the divorced, about 4.0 percent and the widowed account for the remaining 2.0 percent of the movers. In Kaduna metropolis, most of the movers are married. This confirms the result of the study by Gbakeji and Rilwani (2009) in their analysis of marital status and household mobility in Warri.

The study of the effect of family change on geographical mobility has a long pedigree (Kulu and Milewski, 2007; Rossi, 1955; Long, 1972). For example, Fredland (1974), using regression analysis on a sample of households from the Philadelphia-Trenton area in the USA, finds the single less likely to move than the married. Goldstein (1970) using same technique to analyze a sample of San Francisco households, confirms Fredland's findings. It also corroborates the findings of this research where the married constitute the majority of movers when compared with the single, divorced or widowed. For instance, in Kaduna North LGA, the married made up 67.71 percent of the movers in the LGA, in Kaduna South LGA, the married made up 73.77 percent of the movers in the LGA, in

**Table 4.7: Marital Status of Movers in Kaduna Metropolis**

<i>Marital Status</i>	<i>KDNLGA</i>	<i>KDSLGA</i>	<i>CLGA</i>	<i>ILGA</i>	<i>Total</i>	<i>Percentage</i>
Single	30 (23.62%)	31 (16.94%)	26 (24.30%)	2 (4.08%)	89	19.10
Married	86 (67.71%)	135 (73.77%)	78 (72.90%)	44 (89.80%)	343	73.61
Divorced	1 (0.80%)	3 (1.64%)	- (0%)	2 (4.08%)	6	1.29
Widowed	10 (7.87%)	14 (7.65%)	3 (2.80%)	1 (2.04%)	28	6.00
<b>Total</b>	<b>127 (100%)</b>	<b>183 (100%)</b>	<b>107 (100%)</b>	<b>49 (100%)</b>	<b>466</b>	<b>100</b>

Source: Households Survey, March, 2011

Chikun LGA, the married that change residence are 72.90 percent and finally in Igabi LGA, the married constitute 89.58 percent of the movers in this LGA. However, the reason for and the pattern of moves are so complicated that it is difficult for one to predict. A study in Rhode Island, by Speare *et al.* (1974) found that the mobility rate of the married is lower than for those who are divorced or separated. Likewise, Maisel (1966) found that a couple is less likely to move than a single person. The findings of Speare *et al.* (1974) and Maisel (1966) are at variance with the results of this study. Chevan's (1971) analysis of household data from Philadelphia-Trenton area in the USA indicates that mobility rates decline sharply during the early years of marriage.

Married couples exhibit higher residential mobility in Kaduna metropolis than single persons. The serial ethno-religious crises in the metropolis make the heads of households to think first of the family safety. Hence, married couples and their children relocate to safe environment. The singles on the other hand are able to handle ethno-religious crises better as plan of escape into safe environment such as the military barracks is easier to undertake by a single person when need arises than to evacuate entire households. The larger the household size, the higher the cost of escape into 'safe havens'. The contribution of the divorced and widowed to mobility in Kaduna metropolis is minimal. This is because only few household heads are either divorced or widowed.

#### **4.2.4 Family Size**

Family size is an important factor of residential mobility. Okraku (1971) and Quigley and Weinberg (1977) explains that family size has a positive effect on mobility, but only in the household's perception of dwelling unit adequacy. When family size expands, families need large houses, so they change from smaller to larger homes. In Kaduna metropolis, apart from singles and in some cases the widowed who report one person per household, married respondents in most of the neighborhoods have family sizes of between 3 and 5 persons. Ahmed (1995) in his analysis of residential mobility in Bahawalpur City, Pakistan, found that childless families have no desire to move from

small houses to big houses. They only change their residence for better accommodation, good neighbours and better locality.

Table 4.8 shows the relationship between family size and residential mobility in Kaduna metropolis. The table shows that mobility is higher with smaller household size and as the household size increases, mobility tends to decrease. This confirms the observation of Gbakeji and Rilwani (2009) in their analysis of residents' socio-economic characteristics and residential mobility in Warri metropolis. Two hundred and forty seven (247) households representing 53 percent of the movers in the metropolis have household sizes of 1 to 5 persons. The corresponding figures for the 6 to 10 and 11 and over are 163 (35 percent) and 56 (12 percent) respectively. It confirms the observations of Rossi (1955) and Weinberg (1975) that mobility decreases with larger family sizes. However, in Igabi LGA, household sizes of 6-10 members experienced higher mobility than smaller sizes of 1 to 5 members and larger family sizes of 11 and above. The result in Igabi is at variance with what exists in the other three LGAs. In Kaduna North, South and Chikun LGAs of the metropolis, the interplay between household size and residential mobility is a clear case of inverse relationship. With the exception of the result from Igabi LGA, the results of this research show that smaller household sizes of between one and five members experience higher residential mobility than larger household sizes.

**Table 4.8: Family Size and Residential Mobility in Kaduna metropolis**

<i>Family Size</i>	<i>KDNLGA</i>	<i>KDSLGA</i>	<i>CLGA</i>	<i>ILGA</i>	<i>Total</i>	<i>Percentage</i>
1-5	71 (55.91%)	93 (50.82%)	66 (61.68%)	17 (34.69%)	247	53.00
6-10	42 (33.07%)	64 (34.97%)	37 (34.58%)	20 (40.82%)	163	34.98
≥ 11	14 (11.02%)	26 (14.21%)	4 (3.74%)	12 (24.49%)	56	12.02
Total	127 (100%)	183 (100%)	107 (100%)	49 (100%)	466	100

Source: Households Survey, March, 2011



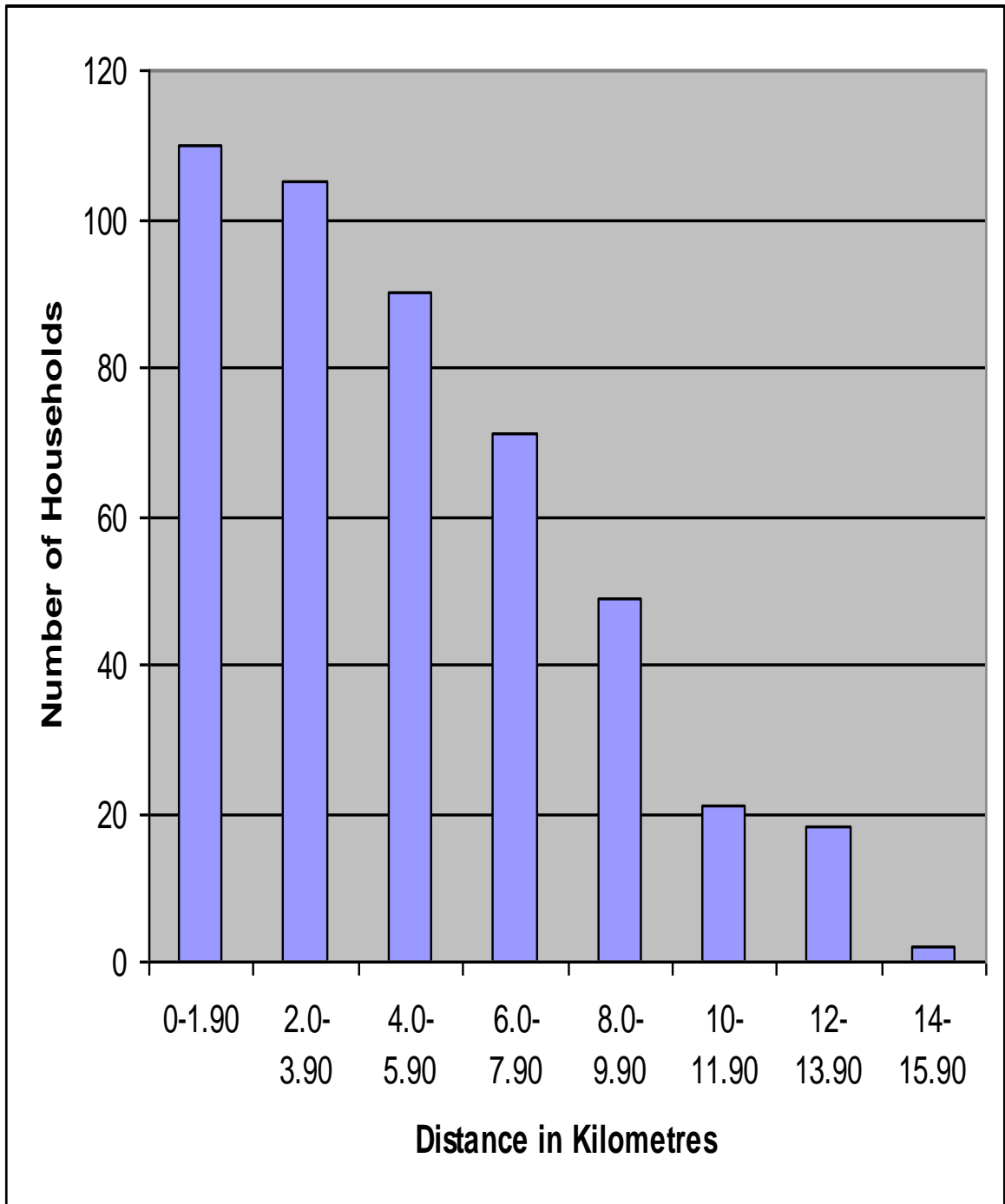
## **CHAPTER FIVE**

### **DISTANCE, DIRECTION AND RESIDENTIAL MOBILITY**

This chapter focuses on the relationship between volume of residential mobility and distances between the present and previous residences of households in Kaduna metropolis. It also examines the direction of movement of the 466 households who changed residence. In this chapter, the objective is to determine if the residential mobility varies with respect to distance between the present and previous residences of households in Kaduna metropolis and to explore the role of religion in the direction of residential mobility.

#### **5.1 Distances Moved by Households**

Among the 1020 sampled households in Kaduna metropolis, 466 households moved. The distances moved by the 466 households in Kaduna metropolis is shown in Appendix 5. The data in Appendix 5 are summarized into distance bands (Figure 5.1) for a better visual impression. In Figure 5.1 it can be seen that 110 households moved a distance of less than 2 kilometres (km), 105 households are in the distance band of 2 to 3.9 km, 90 households in the distance band of 4 to 5.9 km, 71 in the distance band of 6 to 7.9 km, and 49 households were in the distance band of 8 to 9.9 km. There are 21 households in the distance band of 10 to 11.9 km, 18 households in the distance band of 12 to 13.9 km and 2 households in the distance band of 14 to 15.9 km. This gives credence to the works of O'Leary (2011), Gimpel *et al.* (2008), Santilla *et al.* (2007), Bernasco (2006), van Koppen and Jessen (1998), Tobler (1970), Haggett (1965), Reilly (1931) and Ravenstein (1885) that distance decay exist. Information concerning potential residences is usually acquired through friends, relatives, personal search and realtors amongst others (Table 5.1). A larger proportion (31.97%) of the mover households acquired information concerning potential residences through friends, 20.82% through relatives and 16.30% through personal search.



**Fig. 5.1: Volume of Movement and Distance Covered by Households in Kaduna Metropolis**

(Source: Households Survey, March, 2011)

**Table 5.1: Information Acquisition by Mover Households**

<i>S/No</i>	<i>Source</i>	<i>Frequency</i>	<i>Percent</i>
1	Friends	149	31.97
2	Relatives	97	20.82
3	Personal Search	76	16.30
4	Realtors	43	9.23
5	Co-workers	21	4.51
6	By chance	13	2.79
7	Bill-boards	11	2.36
8	Newspapers	6	1.29
9	Others	50	10.73
TOTAL =		466	100

Source: Households Survey, March 2011

The information acquisition through newspapers contributed the least (1.29%). This could be because the newspapers focused on national issues, hence, could not relay the happenings in a micro system in detail. Kaduna metropolis is a fairly big city. The distance from the city centre to the city limits is about 19km. In the metropolis, the longest distance moved is 15km and the shortest distance is less than 2km. In this context, a move of 5km or less will be considered short, 6 to 10km medium and 11 to 15km long. Table 5.2 shows the proportion of movers in the short, medium and long distance categories. In the metropolis, about 65 percent of the households moved short distances, 26 percent moved medium distances and 9 percent moved long distances (Figure 5.2). A large proportion of the movers made short distance moves. These moves confirm the view of Ahmed (1995) that much of the residential mobility in many parts of the world has been found to be relatively short – distance moves. This study also confirms the findings of Clark (2011) in Australia that residential change is highly distance dependent and that most moves involve short distances. About 26 percent of the households covered the medium distance of 6 to 10km. The households in this category were mostly middle income earners and civil servants. A small percentage of families, about 9 percent, made long distance moves of 11km and over.

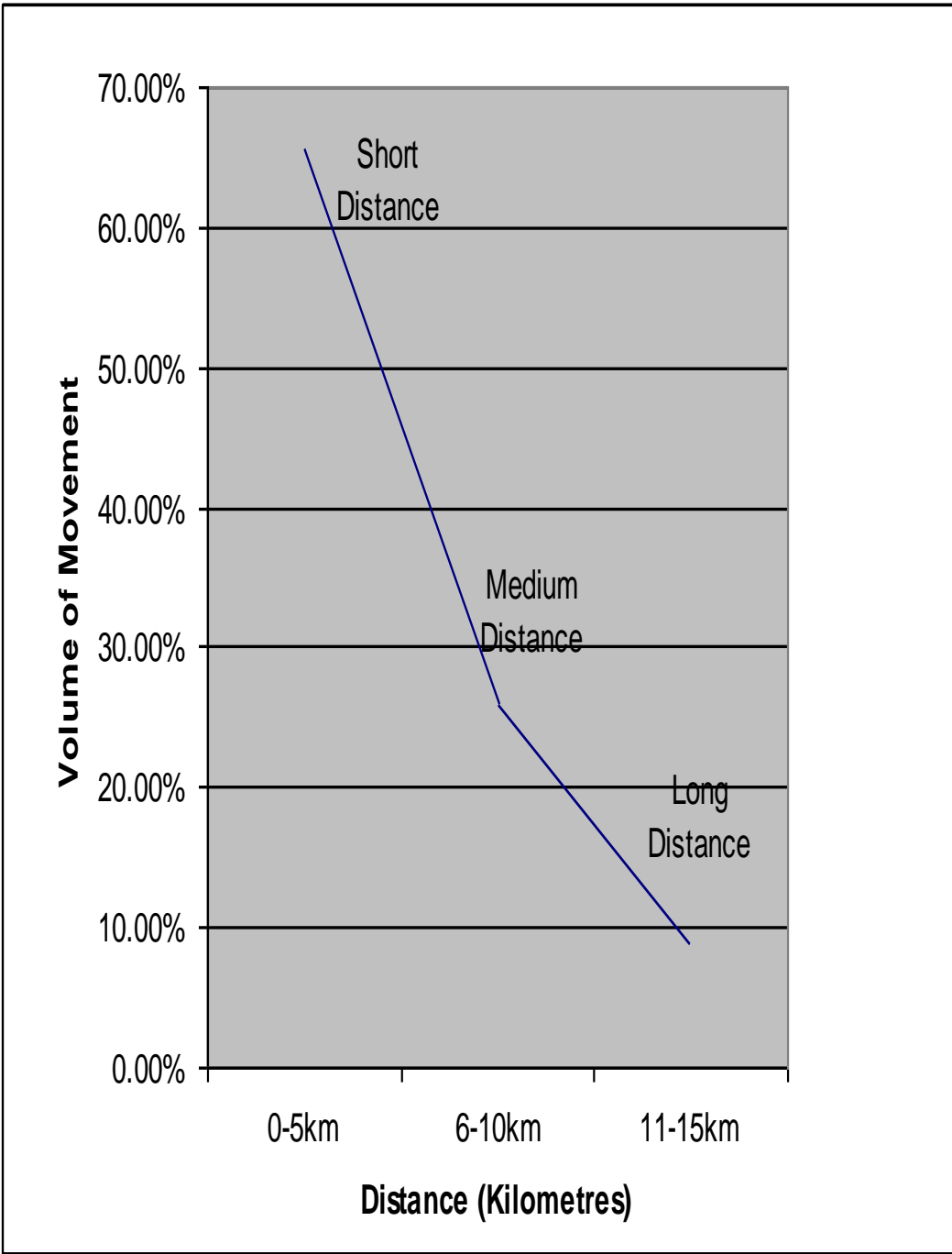
## **5.2 The Effect of Distance**

In order to test the hypothesis that the volume of residential mobility decreases with increasing distance from points of origin, the data in Appendix 5 on the volume of movement and distances covered by households in kilometers was subjected to Pearson product moment correlation (Appendix 6). The resulting correlation coefficient ( $r$ ) is -0.317. This means that as distance increases, the volume of residential mobility decreases. The calculated  $t$ -value is 3.24 (Appendix 6) while Table value of  $t$  under 0.05 (1-tail) and 94 degrees of freedom is 1.6612. The calculated value (3.24) is higher than the critical value  $t$  (1.6612) and therefore, it is significant. It is on these grounds, that the stated hypothesis that volume of residential mobility decreases with increasing distance from points of origin is accepted.

**Table 5.2: Short, Medium and Long Distance Moves**

<i>Classification</i>	<i>Distance</i>	<i>Movers</i>	<i>Percentage</i>
Short	0 – 5 km	305	65.45
Medium	6 – 10 km	120	25.75
Long	11 – 15 km	41	8.80
TOTAL =		466	100

Source: Households Survey, March 2011



**Fig. 5.2: Distance Covered by Movers**  
 (Source: Households Survey, March, 2011)

### **5.3 Movement of Households from the four Local Government Areas of Kaduna Metropolis**

Data on residential relocation in Kaduna metropolis shows that about 47 percent of the households relocated from Kaduna South LGA, 31 percent relocated from Kaduna North LGA, 15 percent from Chikun LGA, and 7 percent from Igabi LGA (Table 5.3). The destinations and religions of the households are presented in Table 5.4.

### **5.4 Movement of Households from Kaduna North Local Government Area (KDNLGA)**

The mobile households from KDNLGA of the metropolis make up 31 percent of all those who moved within the metropolis. The 31 percent represents 146 out of 466 sampled mobile households (Table 5.3). A total of 57 households out of the 146 mobile households in the KDNLGA relocated within the Local Government Area. This is about 39 percent of the moves from this LGA (Table 5.4). The people that relocated within the Local Government are made up of 21 percent Christians and 79 percent Muslims. Majority of these people changed their residences and relocated within the Local Government Area (LGA) for various reasons. These reasons are discussed in detail in chapter six of this work. However, some of the reasons are space requirement and more comfortable accommodation. A total of 52 households (about 36 percent) of the 146 households that moved from KNLGA moved into Kaduna South Local Government Area (KDSLGA). These mover households were made of 29 percent Christians and 71 percent Muslims. There is a part of the KDSLGA called Tudunwada. The place is largely inhabited by Muslims, hence most of the movers from the KNLGA who are Muslims moved to Tudunwada for religious reasons. There are also business opportunities in this LGA. Fairly used building materials are available for sale in Panteka and fairly used textile materials popularly referred to as 'bend down' are available for sale in Kasuabarchi.

**Table 5.3: Movement of Households from Different Local Government Areas of Kaduna Metropolis**

<i>From</i>	<i>Number of Households</i>	<i>Percentage</i>
KDNLGA	146	31.33
KDSLGA	217	46.57
CLGA	70	15.02
ILGA	33	7.08
<b>TOTAL</b>	<b>466</b>	<b>100</b>

Source: Households Survey, March 2011



**Table 5.4: Direction of Households Movement in the Metropolis**

<i>From</i>	<i>Religion</i>	<i>To</i>										Grand Total (%)
		KDNLGA	KDSLGA	CLGA	ILGA	Total (%)	Grand Total					
KDNLGA	Christian	12	15	31	-	58	12.45	146	31.33			
	Muslim	45	37	-	6	88	18.88					
KDSLGA	Christian	12	18	33	-	63	13.52	217	46.57			
	Muslim	43	77	3	31	154	33.05					
CLGA	Christian	5	17	33	-	55	11.80	70	15.02			
	Muslim	3	6	1	5	15	3.22					
ILGA	Christian	1	5	3	-	9	1.93	33	7.08			
	Muslim	7	8	-	9	24	5.15					
TOTAL		466					100	466	100			

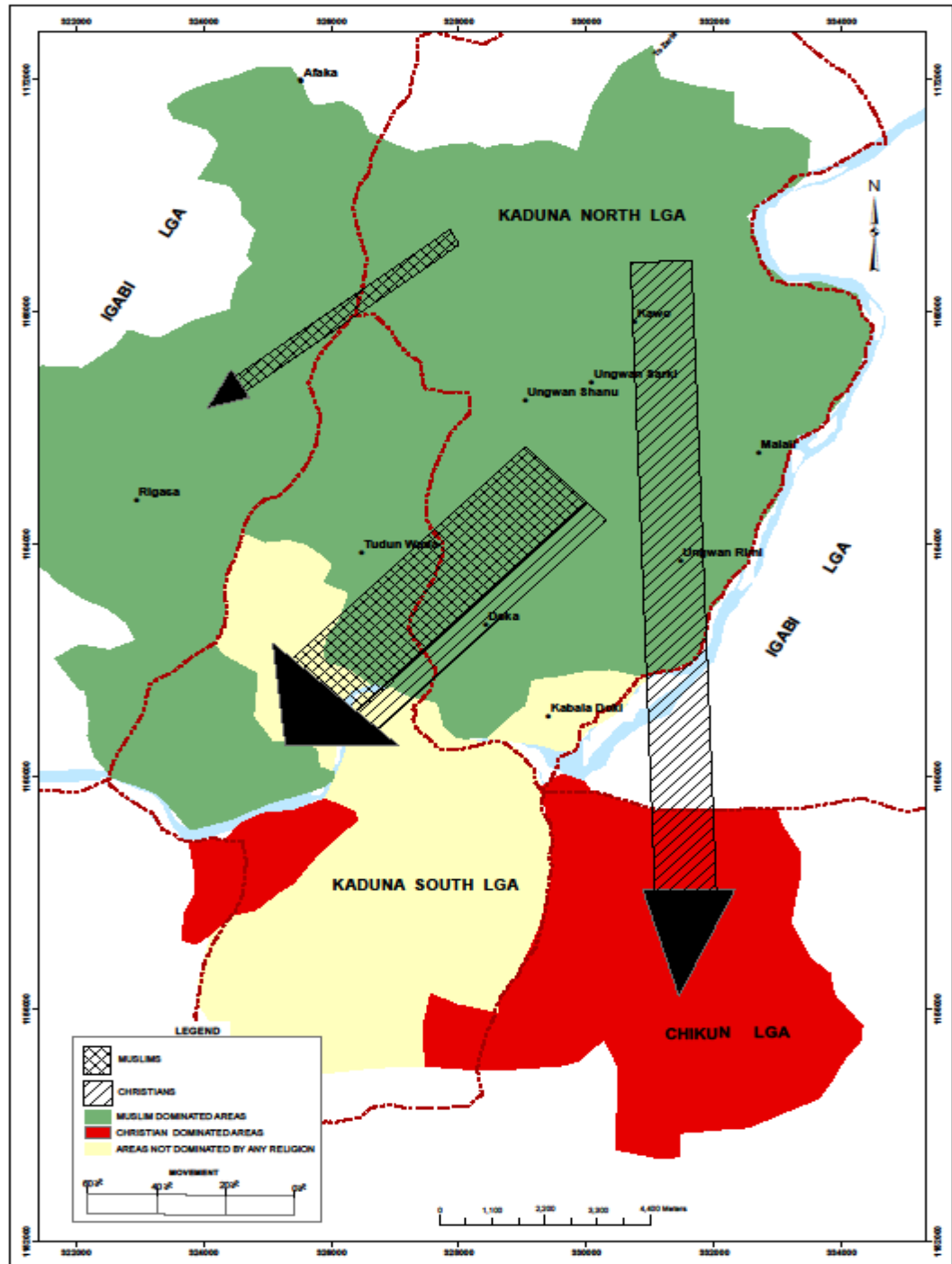
Source: Households Survey, March 2011

Some of the households that moved from KDNLGA into KDSLGA moved because of business opportunities, among other factors. Twenty one percent (31 households) of the mover households from the KDNLGA moved into Chikun Local Government Area (CLGA).

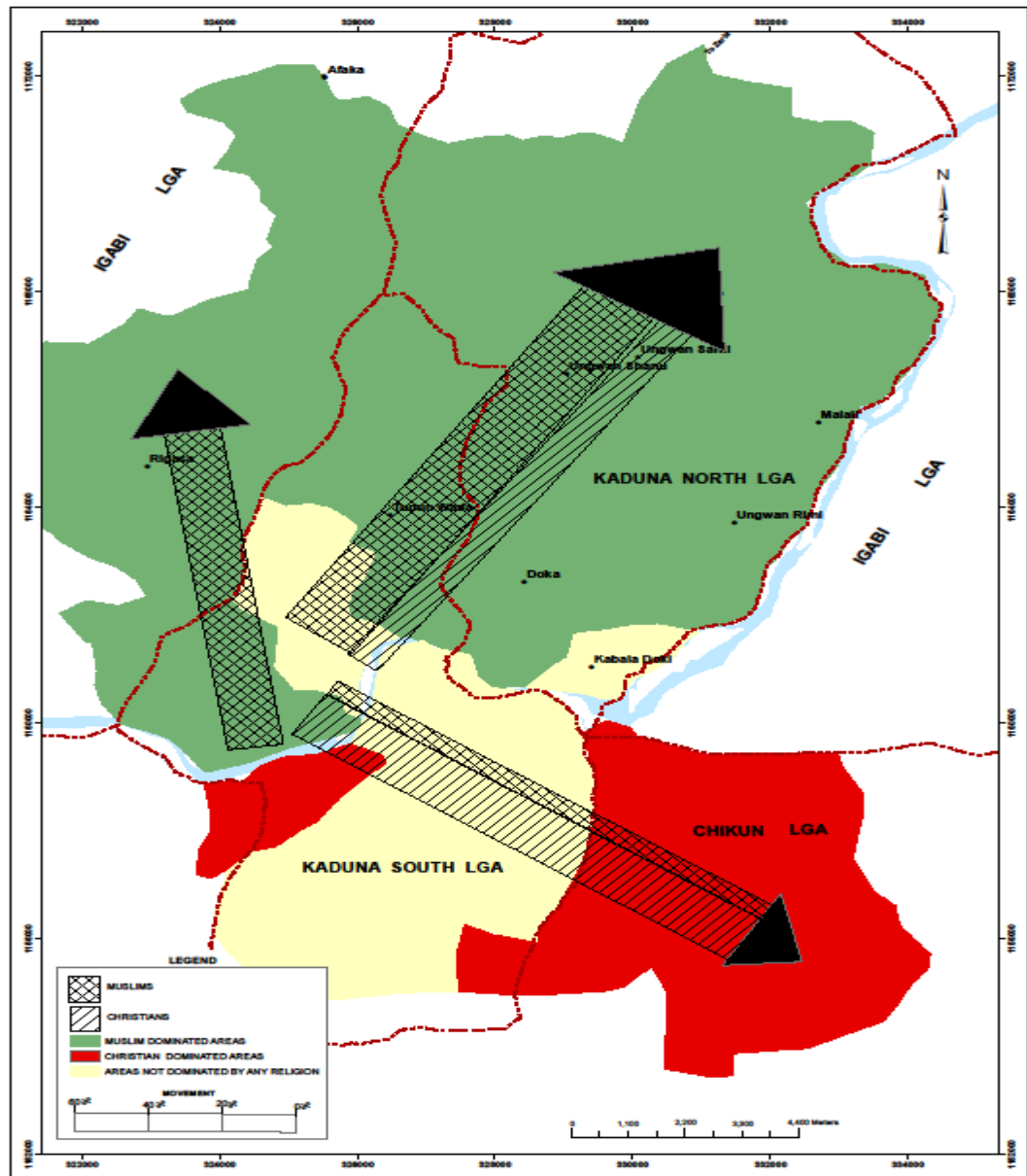
All the households that moved from KDNLGA into CLGA are Christians. These people moved for socio-political and cultural reasons. Chikun LGA is largely inhabited by Christians. The people that moved into this LGA did so largely because of security of lives and properties. Kaduna metropolis is bedeviled by ethno-religious crises; hence, Christians decide to relocate to this part of the metropolis that is largely populated by people of Christian faith. This is in conformity with Schelling's (1971, 1972, 1974, 1978, and 2006) model of residential tipping which showed how the preferences of autonomous individuals about where to live give rise to (unanticipated) aggregate patterns of residential segregation. About 4 percent (that is 6) of the households that moved from KNLGA moved into Igabi Local Government Area (ILGA). Interestingly, unlike the households that moved into CLGA, the movers from the KDNLGA into ILGA are 100 percent Muslims. Igabi LGA is a Muslim enclave. The people that migrate to this zone from KDNLGA do so for safety of their lives and properties. This is because they feel well protected in the environment by living among people of same religion. Figure 5.3 shows the direction of movement of households from Kaduna North Local Government Area of the metropolis.

### **5.5 Movement of Households from Kaduna South Local Government Area (KDSLGA)**

Table 5.4 shows that the largest volume of movement of households within the Kaduna metropolis was from KDSLGA. The mobile households from this LGA were made of 217 households representing about 47 percent of the 466 households that actually moved within the metropolis. Figure 5.4 shows the direction of movement of households from KDSLGA of the metropolis. A substantial portion of the mobility occurs within the Local Government.



**Fig. 5.3: Movement of Households from Kaduna North LGA to other LGAs**  
 (Source: Author's Conceptualization, 2011)



**Fig. 5.4: Movement of Households from Kaduna South LGA to other LGAs**  
 (Source: Author's Conceptualization, 2011)

A total of 95 households representing 44 percent of the 217 households that actually moved relocated within the LGA. Most of these movers relocated for comfortable accommodation in terms of space and facilities and a few moved as a result of nearness to work. The households in this category were made up of 19 percent Christians and 81 percent Muslims. Kaduna South Local Government Area is the industrial base of the metropolis.

In Kaduna South LGA are situated Textile industries, Peugeot Automobile Nigeria (PAN) Ltd, Queensway Aluminum, IBBI Breweries, NOCCACO Cable and Wire industries, Coca-Cola bottling company and 7-up bottling company amongst others. It is therefore, not a surprise that the residents of this LGA are more of company workers and self employed than civil servants. Fifty-five households, representing 25 percent of the mover households from KDSLGA moved to KDNLGA. The movers were made of 22 percent Christians and 78 percent Muslims. The proportion of the Christians and Muslims that moved to KDNLGA is similar to those that moved from KDNLGA to KDSLGA. This is why Graif (2012) noted that geographic proximity between two neighbourhoods and similarity in socio-demographic characteristics shape inter-neighbourhood connectivity based on residential mobility flows. The Central Business District (CBD) of the metropolis is situated in KDNLGA, hence people moved there for business activities. The Federal and State Government Secretariats are there, hence, the civil servants moved there, so as to be nearer their place of work. About 17 percent of the movers from this Local Government Area comprising of 36 households moved to Chikun LGA. The movers were made of 92 percent Christians and 8 percent Muslims. This is similar to the 100 percent Christians that moved from KNLGA to Chikun LGA. The movement of households to this LGA is largely influenced by religion. Chikun Local Government Area is a Christian enclave. The 8 percent of movers from KDSLGA to CLGA that were Muslims did so for multifarious reasons. For instance, these are Muslims that are neither Hausas nor Fulanis. They feel more secure, living among their tribesmen or even among the Christians. This is because they can be grouped along with 'infidels' during any religious crises while living in a Muslim dominated community. About 14 percent of the

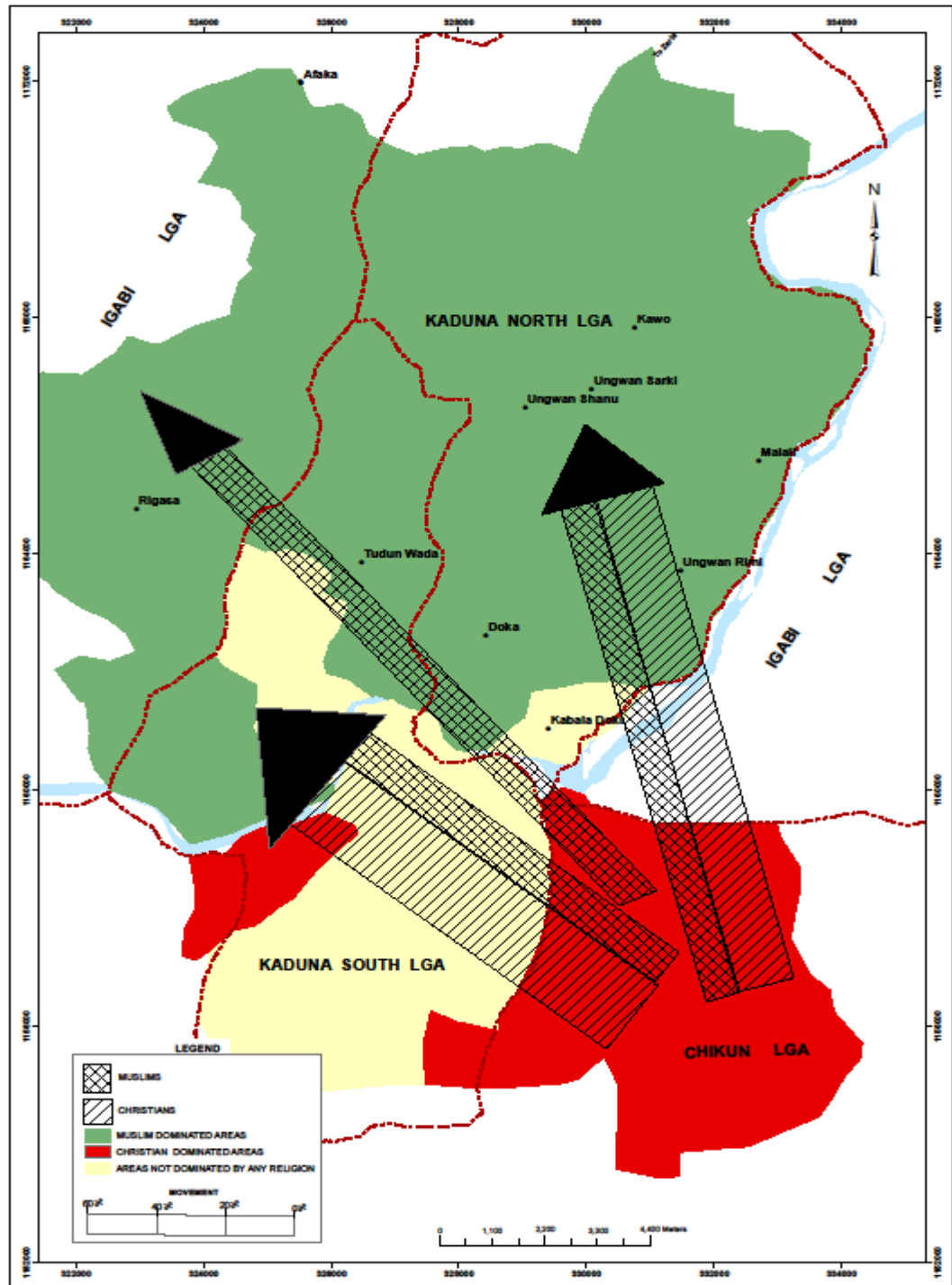
movers comprising 31 households moved from KDSLGA to ILGA. All the households that made the moves were all Muslims. The reason for this residential behaviour is similar to the behaviour exhibited by the Christians that moved to Chikun LGA. Igabi LGA is a Muslim enclave. The households that moved to this LGA were influenced by religious factors. The people feel safer amongst people of the same religion.

### **5.6 Movement of Households from Chikun Local Government Area (CLGA)**

Chikun LGA is situated at the southern part of the metropolis. Figure 5.5 shows the direction of movement of households from this Local Government Area. The LGA is largely inhabited by Christians. Chikun LGA accounts for 15 percent of the mover households within the metropolis. This is because 70 households moved from Chikun LGA out of the 466 mover households in the metropolis. Thirty-four households representing about 49 percent of the 70 households that moved from this LGA actually relocated within the LGA. They comprise 97 percent Christians and 3 percent Muslims. Most people that live in Chikun LGA are either self-employed or company workers. This could be because CLGA shares its boundary with KDSLGA (the industrial base of the metropolis). About 11 percent of the households representing 8 families moved from CLGA to KDNLGA. They comprise 63 percent Christians and 37 percent Muslims. A total of 23 households moved from CLGA to KDSLGA. These households are 33 percent of the movers from Chikun Local Government Area. These were 74 percent Christians and 26 percent Muslims. Seven percent of the mover households from Chikun, that is, five households moved from CLGA to ILGA. The movers from Chikun LGA to Igabi LGA are all Muslims.

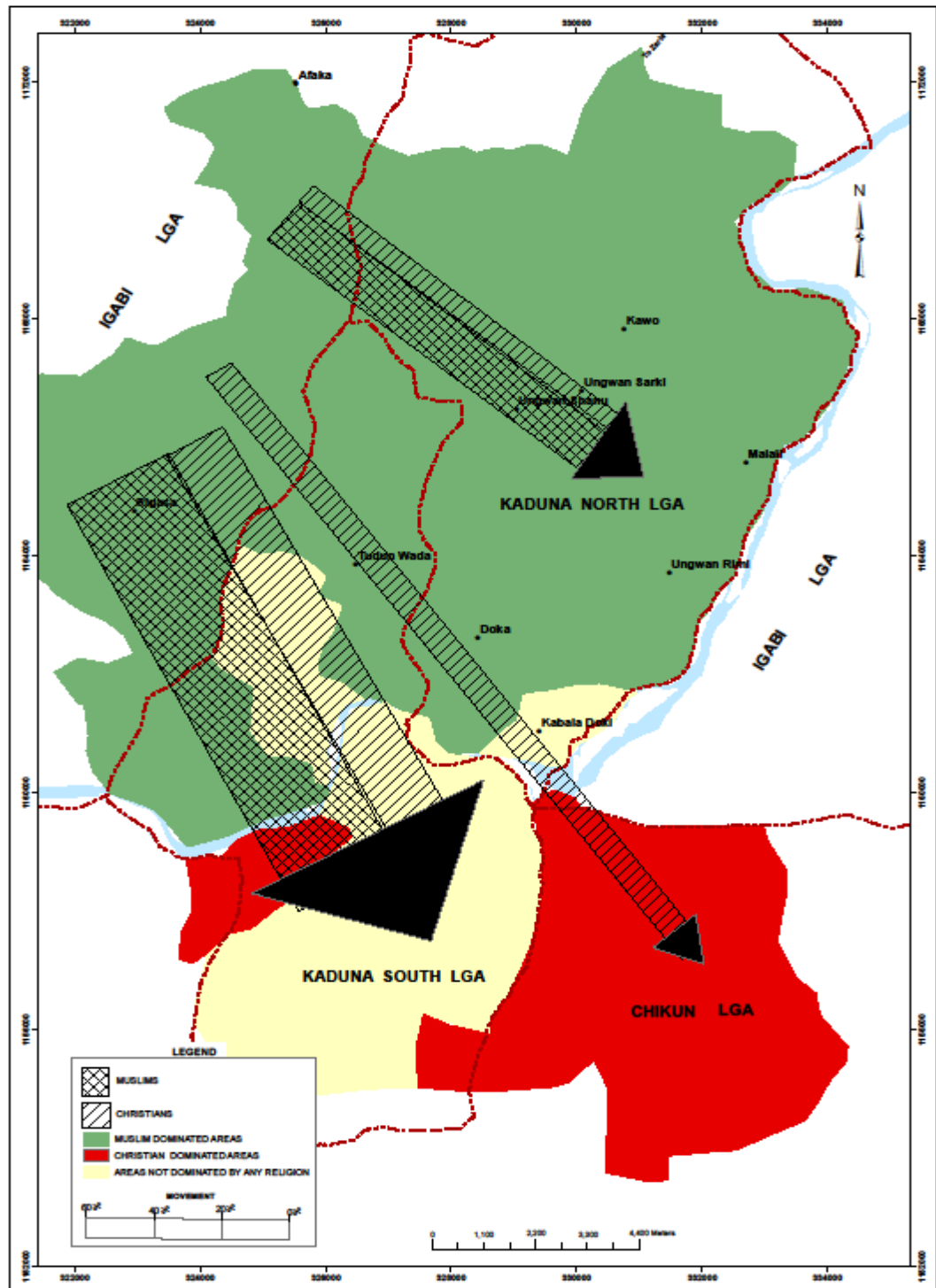
### **5.7 Movement of Households from Igabi Local Government Area (ILGA)**

Igabi Local Government Area (ILGA) recorded the smallest proportion of movers within Kaduna metropolis. This is because out of the total number of 466 mover households in the metropolis, Igabi LGA contributed only 33 households which make up about 7 percent of the movers in the metropolis. Figure 5.6 shows the direction of movement of households from ILGA. About 27 percent representing 9 households relocated within the



**Fig. 5.5: Movement of Households from Chikun LGA to other LGAs**

(Source: Author's Conceptualization, 2011)



**Fig. 5.6: Movement of Households from Igabi LGA to other LGAs**  
 (Source: Author's Conceptualization, 2011)



LGA. All the households in this category are Muslims. Some of the movers relocated to KDNLGA. The movers in this category were 8 households representing 24 percent of the mover households from ILGA. These were made of 13 percent Christians and 87 percent Muslims. They moved to KDNLGA so as to be nearer their places of work and for trading activities. KDNLGA has the Federal Government Secretariat, State Government Secretariat, Kaduna Central Market which is the biggest market in the metropolis, headquarters of various banks and headquarters of communication companies.

The central business district of the metropolis is in KDNLGA. A larger number of mover households in Igabi, about 39 percent, consisting of 13 households moved to KDSLGA. These comprise 38 percent Christians and 62 percent Muslims. About 9 percent of the movers from Igabi Local Government Area relocated to Chikun Local Government Area. They were all Christians.

## **CHAPTER SIX**

### **RESIDENTIAL RELOCATION, CHOICE AND ITS CONSEQUENCES**

The ability to respond to a desire or aspiration to change residence depends on a number of factors. Whatever the factors are, the decision to move would be based on the intensity of the stress generated by the factors. The point where tolerable stress becomes intolerable strain will be different for each household, but once it is reached, the household must decide to either carry out improvement on the existing residential building, lower its aspirations which is an alternative means of coming to terms with existing housing conditions, or undertake residential relocation which has to do with the actual change of residence. The actual change of residence will initiate residential choice. Residential choice is motivated by certain factors. Guma Altés (2013) and Coureau (1987) identify eight different motivations that can induce households' residential choice. These are wealth, economy, practical issue, pride, novelty, security, infatuation and sociability. This chapter is devoted to identifying the reasons for change of residence within Kaduna metropolis and the residential segregation which resulted from residential mobility in the metropolis. Chi-Square ( $\chi^2$ ) statistic was used to determine the influence that neighbourhood exert on residential choice. Multigroup Dissimilarity Index was used to determine the strength of residential segregation while Analysis of Variance (ANOVA) was used to test the hypothesis that there is residential segregation within the city.

#### **6.1 Residential Relocation**

In an analysis of residential relocation it is important to make a distinction between voluntary and involuntary moves. Some mobility is precipitated by war, famine, disease and other factors, but the majority of moves are voluntary (Abler, Adams and Gould, 1971). On the contrary, Rossi (1980) showed in his study of migration in Philadelphia that involuntary moves made up a significant proportion of the total number of households that moved and majority of these were precipitated by property demolitions and evictions. Hence, there is need to identify the driving force behind the residential

mobility in any locality since it is not categorical whether most residential mobility is a result of voluntary or involuntary actions. Though some authors put great emphasis on the distinction between these two types of moves, in reality both the voluntary and involuntary moves merge into one another, and a clear demarcation is not possible (Ahmed, 1995). A view worthy of consideration is that usually not one but several factors are at play in causing change of residence. The reasons for residential relocation in Kaduna metropolis are set out in Table 6.1. Religion plays an important role in the relocation of residents within Kaduna metropolis. The factor of religion is subsumed under conflict/sharia crises that account for about 30 percent of the reasons for relocation and security/safety of lives and properties that account for about 8.0 percent. In all, the factor of religion thus accounts for about 38 percent of the relocation within the metropolis.

The influence of religion on residential mobility in the metropolis is so obvious that Mudashir (2013) wrote that the recurring crises that bedeviled Kaduna State over the years have divided Kaduna metropolis into two with Christians and Muslims living on either side of river Kaduna. While the Muslims live in the northern part of Kaduna metropolis, their Christian counterparts live in the southern part. This is similar to the observation of Aliyu, Kasim, Martin, Diah and Ali (2012) in the city of Jos where residential relocation was found to be in line with religious background, which eventually culminated in splitting the city into two distinct regions by having an area that is solely for Muslims and an area that is solely for Christians. There are other reasons for residential relocation within Kaduna metropolis. These include marriage which accounts for about 9.0 percent, change of environment with 9.0 percent and better accommodation 7.0 percent among other reasons. In Kaduna metropolis, out of 1020 sampled households, 466, that is, 46 percent changed their residences. This is similar to the findings in the United States of America that about 46 percent of the Americans were found to have changed residence over a five year period (Berkner and Faber, 2001; Schachter, 2001; Phinney, 2009). However, Ahmed (1995) found that about 30 percent of residents of Bahawalpur City changed their residence.

**Table 6.1: Reasons for Residential Relocation in Kaduna Metropolis**

<i>REASONS FOR MOVES</i>	<i>FREQUENCY</i>	<i>PERCENTAGE</i>
<b>A. INVOLUNTARY REASONS</b>		
1. Conflict /Sharia crises	138	29.61
2. Security/Safety	37	7.94
3. House Sold by landlord	20	4.29
4. House Renovation by landlord	9	1.93
5. Increase in rent	22	4.72
6. Quit notice	9	1.93
7. Misunderstanding between landlord & tenant	1	0.22
<b>B. VOLUNTARY REASONS</b>		
8. Marriage	27	5.79
9. Built /Bought a house	33	7.08
10. Better accommodation	10	2.15
11. To be independent	10	2.15
12. Prefer high brow area	30	6.44
13. Nearness to work	42	9.01
14. Change of environment	3	0.64
15. Completed education (School)	6	1.29
16. Cheap accommodation	12	2.58
17. Not satisfied with previous accommodation	9	1.93
	5	1.07
18. Greener pasture	1	0.22
19. Social amenities		
20. Nearness to market		
<b>TOTAL</b>	<b>466</b>	<b>100</b>

Source: Households Survey, March, 2011

A significant proportion, 70 percent of the households did not change their residence in spite of their long stay in the city. The findings on residential mobility in Kaduna metropolis are akin to those of Bahawalpur City in that a larger proportion of the residents have not changed residence at all within the city. The percentage of the residents that have changed accommodation within the metropolis is 46 percent, leaving a larger percentage of 54 percent yet to relocate within the metropolis. The rate of the immobility, however, is not as high as that of the Bahawalpur City. All the same, it shows that the households that are yet to change their residence within the city are more than those that have changed their residences.

### **6.1.1 Involuntary Moves**

Involuntary moves are forced moves caused by demolition of property, eviction, danger to life and property due to floods, sectarian crises and other factors. Out of the households that have moved within Kaduna metropolis, about 51 percent were triggered by involuntary factors (Table 6.1). Ethno-religious crises have occurred severally within Kaduna metropolis. Hence, the issue of conflicts and 'Sharia' crises contributed about 30 percent of the moves in the metropolis. The safety of lives and properties is very important to the households. This is understandable. Kaduna metropolis in the past few years has witnessed series of ethno-religious crises that resulted in the destruction of lives and properties. Residents are safer in the environment populated by their own religious or tribal groups. The people of the same religion or tribe join and muster resources to ward-off attacks when necessary. In a similar research, conducted in Hong Kong, by Ming-wai (2006), safety was found to be a very important factor in determining residential choice. Entwisle (2007) explains that where people live is a matter of choice, at least to some extent. Good weather, socioeconomic and ethnic composition, safety, accessibility, and quality of the natural and built environment influence where people choose to live. Kay *et al.* (2010) posit that security has long been recognized as an important element in

residential location choice. The issue of security of lives and properties is obvious in the residential location choice in Kaduna metropolis.

Agbola (2002) and Megbolugbe (1991) explain that a man and in this case, a household, may first and foremost, look for safety and security in choice of residence before consideration can be given to any other factor as this is very important for self preservation. Security of lives and properties was cited by about 8.0 percent of the respondents for their relocation in the metropolis. Other factors that contribute to involuntary moves in the metropolis include houses sold by landlords that culminates in to vacation of such houses for the buyers, landlords issuing notice to quit to tenants to allow for renovation of such houses and increase in house rent to an amount that the resident tenants cannot afford.

### **6.1.2 Voluntary Moves**

Voluntary moves are those where the decision to move is not forced on movers. This type of move is generated by factors like increase in income and change in the location of job. About 49 percent of residential relocation in Kaduna metropolis was voluntary (Table 6.1). Marriage accounted for about 9.0 percent of the moves in Kaduna metropolis. Clark and Huang (2003) and Alkay (2011) found that marital status change and birth of a child play an important role in residential mobility. Also, as households increase in size, they require more space, and residential mobility is the process whereby households adjust household size to the housing stock. In the metropolis, people who moved into their personal houses accounted for about 6.0 percent of movers. This is in line with the findings of Afolayan (1994) in the Ibadan region. She disclosed that many reasons were given by the movers for moving, but the frequently mentioned one is that some of them had built or bought their own personal houses and so moved into them. Some of the people within Kaduna metropolis relocated to better accommodation.

Another factor that contributed to why people changed residence within the metropolis is the need for them to be independent. Afolayan (1994) observed that some movement

took place in Ibadan from family houses in the inner city to rented apartments. Such moves make the movers to distance themselves from family members. In Kaduna metropolis, about 2.0 percent of the moves were as a result of the desire to be independent. Nearness to work is another reason for residential relocation in Kaduna metropolis and it accounted for about 6.0 percent of the moves within the metropolis. Nearness to work is an age long issue in residential mobility. For example, Sanni and Akinyemi (2009) in their analysis of the determinants of household's residential districts preferences within the metropolitan city of Ibadan found closeness to work to have contributed 11% of the reasons for choosing residential areas in Ibadan. Residential location close to place of work saves time, money and energy spent on journey to work.

The decision to change environment contributed greatly to residential mobility within Kaduna metropolis. The decision to change environment accounted for about 9.0 percent of the moves within the metropolis. Entwisle (2007) explains that socioeconomic and ethnic composition, safety, accessibility, and quality of the natural and built environment may influence where people choose to live. When choosing a neighborhood, people may anticipate the consequences of living there. People may also choose neighborhoods based on their potential to enhance health and to avoid negative outcomes. In Kaduna metropolis, relocation was also undertaken by some of the students that have completed their education, though relocation of students accounted for less than 1.0 percent of the moves within the metropolis. Ahmed (1995) found that though the residents of Bahawalpur City were largely immobile, the few families that changed their houses were renters and students. Cheap accommodation is a contributory factor for changing residences within Kaduna metropolis. Cheap accommodation accounted for about 1.0 percent of the moves in the metropolis. This supports Sheffer's (1990) observation that housing allocation in cities is based on financial affordability.

Some of the people within Kaduna metropolis moved because they were not satisfied with their previous accommodation. Some of the reasons given were incompatibility with their neighbours, dilapidated buildings and inadequate water supply among others. The

people in this group accounted for less than 3.0 percent of the moves in the metropolis. Coulter *et al.* (2011) and Brown and Moore (1970) noted that households decide to move in response to rising stress, attempting to relocate to a new dwelling which better satisfies their changing needs, desires and aspirations. Kley (2010) and Lu (1999) argue that the stress can build up gradually and generate dissatisfaction, which in turn stimulates a regular sequence of moving desires, intentions and expectations. Other factors that contributed to residential mobility within Kaduna metropolis include, search for greener pasture and nearness to market and social amenities. Search for greener pasture accounts for about 2.0 percent of the moves. Nearness to market accounts for less than 1.0 percent of the moves and social amenities accounts for about 1.0 percent of the moves in the metropolis.

In general, about 51 percent of the respondents choose their residence because of risks to lives and properties due to religious crisis. This action by residents in the metropolis eventually leads to another phenomenon - residential segregation. Clark (2009) noted that race and ethnic issues are important in the analysis of housing segregation. Schelling (1971, 1974) and Sakoda (1971) found that residential distributions in cities populated by agents of two non-friendly types tend to show segregation. The serial crises between the Muslims and the Christians in Kaduna metropolis made most of the wards to be dominated by either Muslims or Christians.

## **6.2 Residential Choice**

The study of residential mobility and housing choice has captured the interest of scholars in a diverse range of disciplines amongst which are geography, economics, sociology, planning, and psychology (Montgomery and Curtis, 2006). Bruch and Mare (2011) opine mobility studies can combine information on residential choices of individuals with population data to infer the population dynamics and residential patterns that are implied by the residential preferences and choices of individuals. In the analysis of residential preference and residential mobility, a wide range of factors are considered.



### **6.2.1 Neighbourhood Characteristics**

Bruch and Mare (2011) focused on how individuals respond to race-ethnic composition of their neighbourhood while reviewing methodological issues in the analysis of residential preference and residential mobility. The type of people living in a community can play a key role in people's housing choices (Sirgy, Grzeskowiak and Su, 2005). Pagliara, Preston and Kim (2002) observes that households may desire to reside in areas with others having similar social characteristics. Ogunbajo *et al.* (2015) found in 'Badariya' that residential location choices are most influenced by religious and ethnic affiliations, security of neighbourhood and cost of land. Ogunbajo *et al.* (2015) explains that people in developing countries choose to live close to friends and relatives, or in areas where majority of the occupants are of the same ethnic background. Many studies in housing research have shown that social stratification and homogeneity is important to residential location choices (Sirgy *et al.*, 2005). This research tends to look at the four Local Government Areas in the metropolis as distinct neighbourhoods and religion as a preference factor of residential choice in the neighbourhoods.

Table 6.2 shows the dominant religions as provided by the 466 mover households in the four Local Government Areas under study. Basically there are two groups: Christianity and Islam. The data in Table 6.2 was subjected to Chi-Square ( $\chi^2$ ) statistical analysis (Appendix 8). The Chi-Square calculated was  $\chi^2 = 241.171$  With 3 degrees of freedom, the  $\chi^2$  distribution Table shows a value of 7.815 at .05 and a value of 11.345 at .01 The calculated Chi-Square ( $\chi^2 = 241.171$ ) is significant at 1 percent level and therefore conclude that residential choice is influenced by neighbourhood characteristics.

### **6.2.2 Type of House**

Fattah *et al.* (2015) found housing type to significantly influence residential location choice in Penang, Malaysia. Montgomery and Curtis (2006) noted range of housing types that could be available to consumers to include single family detached homes, town houses and apartments or flats. Housing location choices are in many ways a product of constraint in that they depend on which housing types are available in a particular

location and at affordable prices (Burgess and Skeltys, 1992; Paaswell and Benjamin, 1977). It is of interest in this study to examine the type of houses occupied by the ‘mover’ households in Kaduna metropolis.

**Table 6.2: Dominant religions in the four LGAs of the metropolis**

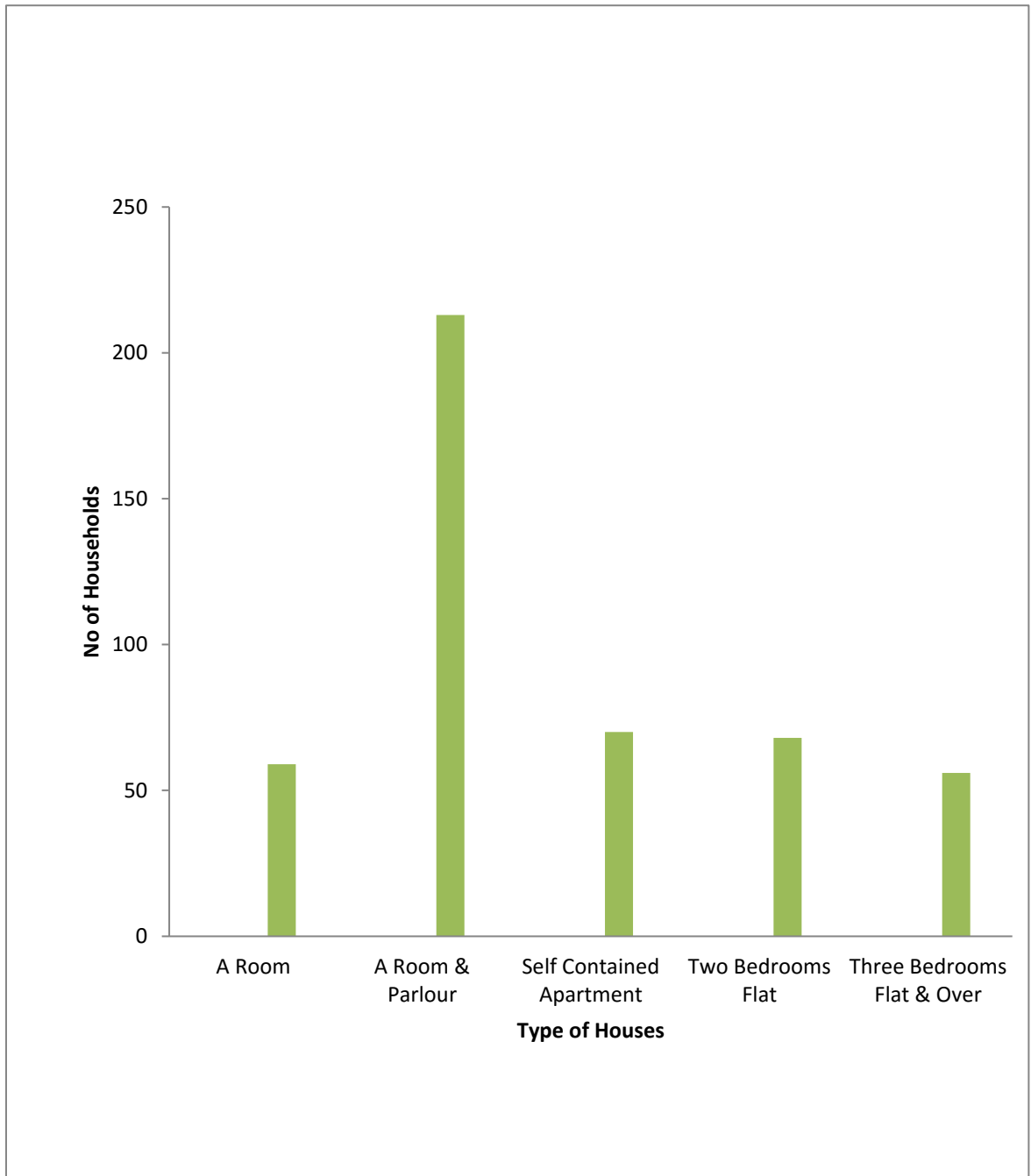
RELIGION	KDSLGA	CLGA	ILGA	KDNLGA	Σ
Christianity	38	107	-	27	172
Islam	145	1	48	100	294
Total	183	108	48	127	466

Source: Households’ Survey, March 2011

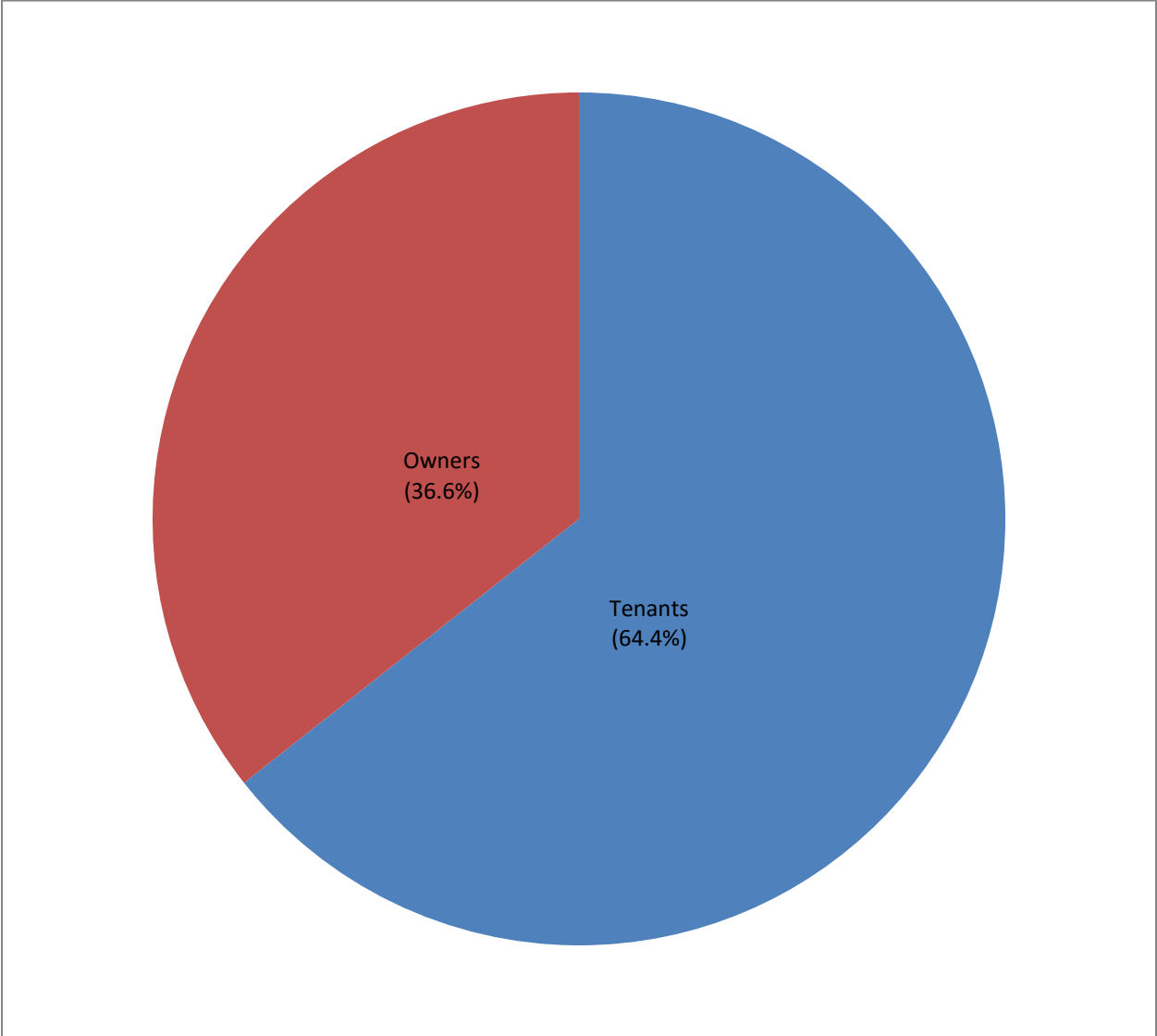
The type of houses occupied by the ‘mover’ households is shown in Figure 6.1. Mohammadzadeh *et al.* (2015) observes that behaviour and preferences of families for housing in different neighbourhoods may be different. In as much as this is true, this study intends to look at households’ preferences for housing at macro level. That is, looking at the families’ preference for housing in all the neighbourhoods put together. In Figure 6.1, about 46 percent of the households (213 households) moved into a single room and parlour. About 15 percent of the households (70 households) moved into self contained apartment, about 14 percent (68 households) moved into two-bedrooms flat, about 13 percent (59 households) moved into a room, 12 percent (56 households) into three-bedrooms flat and over. It shows that a single room and parlour are in great demand in the metropolis. This information could be of interest to property developers. The demand for bigger apartment is low. This is as a result of costs implications.

### **6.2.3 Tenure**

Tenure plays important role in residential relocation of households. Renters have lower relocation costs, hence, are ‘foot loose’ in the housing market. They move more frequently than owner occupiers (Burgess and Skeltys, 1992; Hassan, Zang and McDonnell-Baum, 1996; Crane, 1996; Oswald, 1999; Montgomery and Curtis, 2006). Renters placed a greater emphasis on reducing travel time to work than owner occupiers. Owner occupiers may have to compromise access to work in order to achieve home ownership (Burgess and Skeltys, 1992). Figure 6.2 shows the housing tenure of ‘mover’ households in the metropolis. Four hundred and sixty-six (466) households relocated in the study area out of which 300 households were tenants. The tenants made up 64 percent of the ‘mover’ households. This is because renters experience lower relocation costs when compared to owner occupiers. The finding of this research confirms the earlier researches on tenure by various authors that renters move more frequently than owner occupiers.



**Fig. 6.1 Type of Houses Occupied by 'Mover' Households**



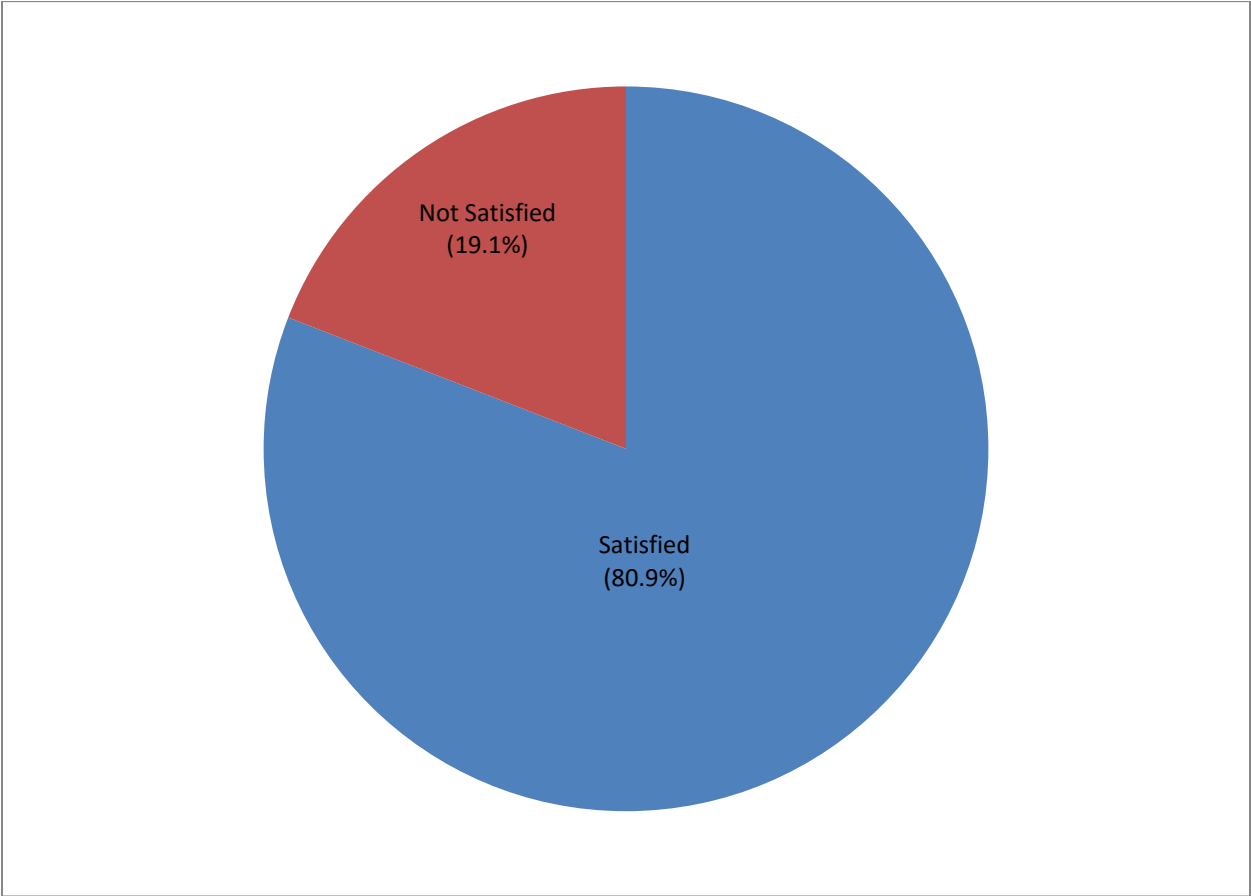
**Fig. 6.2 Housing Tenure of 'Mover' Households in Kaduna Metropolis**

#### **6.2.4 Residential Satisfaction**

Residential satisfaction is a broad concept and is associated with multidimensional aspects such as physical, social, neighbourhood factors, psychological and socio-demographic characteristics of the residents (Balestra and Sultan, 2013; Waziri, Yusof and Salleh, 2013). The broad concept of residential satisfaction is not investigated by this study. A simple answer of either 'yes' or 'no' was sought from the respondents whether they were satisfied with the house they occupy at present and Figure 6.3 shows the residential satisfaction expressed by the households. Three hundred and seventy-seven (81 percent) households expressed satisfaction with their current housing conditions while eighty-nine (19 percent) households were dissatisfied with the current house(s) they occupy. This shows that the probability of relocating almost immediately is remote for majority of the households since they are comfortable with the residence they occupy for now.

#### **6.3 Consequences of Residential Mobility**

Residential mobility in Kaduna metropolis is not without its consequences. Residential mobility amongst other factors led to the expansion of Kaduna metropolis (Oluwole, 2013). This confirms the observation of Knox (1987) that cities begin to expand in spatial terms when families and households move from one part to settle in another. As this occurs, the city expands to its neighbouring peri-urban areas. This process is true of Kaduna metropolis. The city began as a pure administrative and commercial centre but has now grown in size to embrace new areas such as Goningora, Marabarido, Ungwa-Mejero, Rafinguza, Mahuta and Kamazou not covered by this study. Insufficient accommodation in the areas people moved to, forced some of the movers to buy parcels of land and build their own houses. Furthermore, the ever-increasing demand for housing against the limited housing supply favours land-owners and house-owners. This has led to land and housing speculation in Kaduna metropolis to the detriment of tenants.



**Fig.6.3 Residential Satisfaction Expressed by the 'Mover' Households in Kaduna Metropolis**

### **6.3.1 Strengthening of social ties**

Change of residence within the metropolis also resulted in the strengthening of social ties. As a family changes residence, it improves its networking with people that share the same faith and the same tribe (Oluwole, 2013). Most of the ‘mover’ households in Kaduna are non-indigenes and as such they carefully move to areas inhabited by people of similar culture. Afolayan (1994) observes that movements within the city could be influenced by social links. Likewise, Hedman (2012) observes that social ties are among the most important factors explaining destination choices of mover households.

### **6.3.2 Residential Segregation**

Residential mobility in Kaduna metropolis resulted in residential segregation of the metropolis (Oluwole, 2013). Cultural issues are important in the conversations about the housing segregation phenomenon (Clark, 2009). The issue of culture is better explained by the agent-based model. One of the first agent – based models was Schelling’s (1971, 1972, 1974, 1978, 2006) model of residential tipping which showed how the preferences of autonomous individuals about where to live give rise to (unanticipated) aggregate patterns of residential segregation. Ajibuah (2008) explains that ethno-religious issues are social and historical phenomena. Mudashir (2013) observes that after the crises that took place in Kaduna in the year 2002, Christians who owned houses at the northern part of the metropolis such as Tudunwada, Rigasa and Kawo sold them and relocated to the southern part. Likewise, Muslims who owned houses at the southern part like Sabo Tasha and Narayi sold them and relocated to the northern part of the metropolis

Multigroup Dissimilarity Index was used to describe the differential distribution of the religious groups across the neighbourhoods in the metropolis. Edgar (2014) using a similar method, engaged index of dissimilarity to evaluate ethnic residential concentration in Sydney and Melbourne, Australia. The function of multigroup



dissimilarity index is described in detail on pages 54 and 55 of this Thesis. Table 6.3 shows the multigroup dissimilarity index of households in Kaduna metropolis.

**Table 6.3: Multigroup Dissimilarity Index of Households in Kaduna Metropolis**

S/N	WARD	$t_j$	I	2TI	RELIGION	$\pi_{jm}$	$\pi_m$	$\pi_{jm} - \pi_m$	$\frac{I_j}{2TI}$	$\pi_{jm} - \pi_m$
1.	CW3	63	0.448014	913.94856	1. Christianity	0.904	0.321	0.583	0.040	
					2. Islam	0.048	0.670	0.622	0.043	
					3. Traditional	0.000	0.003	0.003	0.000	
					4. Others	0.048	0.006	0.042	0.003	
2.	CW7	64	0.448014	913.94856	1. Christianity	0.797	0.321	0.476	0.033	
					2. Islam	0.203	0.670	0.467	0.033	
					3. Traditional	0.000	0.003	0.003	0.000	
					4. Others	0.000	0.006	0.006	0.000	
3.	CW8	25	0.448014	913.94856	1. Christianity	0.920	0.321	0.599	0.016	
					2. Islam	0.040	0.670	0.630	0.017	
					3. Traditional	0.040	0.003	0.037	0.001	
					4. Others	0.000	0.006	0.006	0.000	
4.	CW9	28	0.448014	913.94856	1. Christianity	0.928	0.321	0.607	0.019	
					2. Islam	0.036	0.670	0.634	0.019	
					3. Traditional	0.000	0.003	0.003	0.000	
					4. Others	0.036	0.006	0.030	0.001	
5.	IW7	92	0.448014	913.94856	1. Christianity	0.011	0.321	0.310	0.031	
					2. Islam	0.989	0.670	0.319	0.032	
					3. Traditional	0.000	0.003	0.003	0.000	
					4. Others	0.000	0.006	0.006	0.001	
6.	KDNW1	57	0.448014	913.94856	1. Christianity	0.281	0.321	0.040	0.002	
					2. Islam	0.701	0.670	0.031	0.002	
					3. Traditional	0.000	0.003	0.003	0.000	
					4. Others	0.018	0.006	0.012	0.001	
7.	KDNW10	45	0.448014	913.94856	1. Christianity	0.356	0.321	0.035	0.002	
					2. Islam	0.622	0.670	0.048	0.002	
					3. Traditional	0.022	0.003	0.019	0.001	
					4. Others	0.000	0.006	0.006	0.000	
8.	KDNW11	21	0.448014	913.94856	1. Christianity	0.048	0.321	0.273	0.006	
					2. Islam	0.952	0.670	0.282	0.006	
					3. Traditional	0.000	0.003	0.003	0.000	
					4. Others	0.000	0.006	0.006	0.000	
9.	KDNW12	50	0.448014	913.94856	1. Christianity	0.060	0.321	0.261	0.014	
					2. Islam	0.920	0.670	0.250	0.014	
					3. Traditional	0.000	0.003	0.003	0.000	
					4. Others	0.020	0.006	0.014	0.001	
10.	KDNW5	38	0.448014	913.94856	1. Christianity	0.500	0.321	0.179	0.007	
					2. Islam	0.500	0.670	0.170	0.007	
					3. Traditional	0.000	0.003	0.003	0.000	
					4. Others	0.000	0.006	0.006	0.000	
11.	KDNW6	55	0.448014	913.94856	1. Christianity	0.109	0.321	0.212	0.013	
					2. Islam	0.873	0.670	0.203	0.012	
					3. Traditional	0.018	0.003	0.015	0.001	
					4. Others	0.000	0.006	0.006	0.000	
12.	KDNW7	7	0.448014	913.94856	1. Christianity	0.143	0.321	0.178	0.001	
					2. Islam	0.857	0.670	0.187	0.001	
					3. Traditional	0.000	0.003	0.003	0.000	
					4. Others	0.000	0.006	0.006	0.000	
13.	KDNW8	33	0.448014	913.94856	1. Christianity	0.364	0.321	0.043	0.002	
					2. Islam	0.636	0.670	0.034	0.001	
					3. Traditional	0.000	0.003	0.003	0.000	
					4. Others	0.000	0.006	0.006	0.000	

14.	KDNW9	58	0.448014	913.94856	1. Christianity	0.069	0.321	0.252	0.016
					2. Islam	0.931	0.670	0.261	0.017
					3. Traditional	0.000	0.003	0.003	0.000
					4. Others	0.000	0.006	0.006	0.000
15.	KDSW10	25	0.448014	913.94856	1. Christianity	0.040	0.321	0.281	0.008
					2. Islam	0.960	0.670	0.290	0.008
					3. Traditional	0.000	0.003	0.003	0.000
					4. Others	0.000	0.006	0.006	0.000
16.	KDSW11	39	0.448014	913.94856	1. Christianity	0.282	0.321	0.039	0.002
					2. Islam	0.718	0.670	0.048	0.002
					3. Traditional	0.000	0.003	0.003	0.000
					4. Others	0.000	0.006	0.006	0.000
17.	KDSW12	59	0.448014	913.94856	1. Christianity	0.136	0.321	0.185	0.012
					2. Islam	0.864	0.670	0.194	0.013
					3. Traditional	0.000	0.003	0.003	0.000
					4. Others	0.000	0.006	0.006	0.000
18.	KDSW2	117	0.448014	913.94856	1. Christianity	0.496	0.321	0.175	0.022
					2. Islam	0.504	0.670	0.166	0.021
					3. Traditional	0.000	0.003	0.003	0.000
					4. Others	0.000	0.006	0.006	0.001
19.	KDSW5	63	0.448014	913.94856	1. Christianity	0.000	0.321	0.321	0.022
					2. Islam	1.000	0.670	0.330	0.023
					3. Traditional	0.000	0.003	0.003	0.000
					4. Others	0.000	0.006	0.006	0.000
20.	KDSW8	39	0.448014	913.94856	1. Christianity	0.282	0.321	0.039	0.002
					2. Islam	0.718	0.670	0.048	0.002
					3. Traditional	0.000	0.003	0.003	0.000
					4. Others	0.000	0.006	0.006	0.000
21.	KDSW9	42	0.448014	913.94856	1. Christianity	0.071	0.321	0.250	0.011
					2. Islam	0.929	0.670	0.259	0.012
					3. Traditional	0.000	0.003	0.003	0.000
					4. Others	0.000	0.006	0.006	0.000

$$D = \sum_{m=1}^M \sum_{j=1}^J \frac{t_j}{211} \left| \pi_{jm} - \pi_m \right| = 0.579$$

Source: Households Survey, March 2011

The table shows 1020 respondents (T) spread across twenty one wards in the metropolis (J = 21) comprising four different religions: Christianity, Islam, Traditional, and others (M = 4) and Simpson's Interaction index (I) = 0.448014 (constant). The number of individuals in sub area j ( $t_j$ ) is the households sample size in each of the wards. For instance, sixty-three (63) households were sampled from Chikun Ward 3 (CW3), ninety-two (92) households were sampled from Igabi Ward 7 (IW7) and 42 households were sampled from Kaduna South Ward 9 (KDSW9). The proportion of each group in the population ( $\pi_m$ ) was calculated. In the metropolis, Christians were about 32 percent (0.321), Muslims were 67 percent (0.670), Traditional worshipers were less than 1 percent (0.003) and Others were less than 1 percent (0.006). The proportions of each group ( $\pi_{jm}$ ) in each of the wards were also calculated. For instance, in Chikun Ward 3, Christians constitute about 90 percent (0.904), Muslims about 5 percent (0.048), Others about 5 percent (0.048) while there is no traditional worshiper in the ward.

In Kaduna South Ward 5, the households were 100 percent Muslims. Thus, Christians constitute zero percent (0.000), Islam 100 percent (1.000), Traditional zero percent (0.000) and Others zero percent (0.000) of households. In Table 6.3, it is obvious that practitioners of the four religions are not evenly distributed in the metropolis. There is a ward (KDSW5) where all the households were Muslims. There are wards where the households are either Muslims or Christians such as CW7, IW7 and KDNW11. Traditional worshipers can be found along with Christians and Muslims in a few of the wards such as CW8, KDNW10 and KDNW6. People of other religions that did not fall under Christianity, Islam or Traditional were found along with other religions in CW3, CW9, KDNW1 and KDNW12. Table 6.3 shows the dissimilarity index of Kaduna metropolis to be 0.58. The value of multigroup dissimilarity index ranges from 0 (complete integration) to 1 (complete segregation). Parisi and Lichter (2012) used secondary data and found that both in 1990 and 2000 the segregation index for "Hispanic

segregation in America's New Rural Boomtowns" was about 0.50 which is moderately high by conventional standard. The segregation index of 0.58 for Kaduna metropolis is slightly above the index of 0.50 for "Hispanic segregation in America's New Rural Boomtowns" in 1990 and 2000. Hence, the segregation index of 0.58 for Kaduna metropolis is moderately high.

### **6.3.2.1 Spatial Pattern of Residential Segregation**

Table 6.4 shows the proportion of households practicing various religions in Kaduna metropolis. Wards that have at least 60 percent of its residents as members of a particular religion are colour-coded in the table. Since the segregation index of Kaduna metropolis is moderately high (0.58), most of the wards falls into this category. The colour-codes are Islam (green), Christianity (brown) and wards that do not record at least 60 percent of any religion were coded yellow. In the table, Chikun Ward 3 (CW3), is made of about 90 percent (0.904) Christians, about 5 percent Muslims (0.048) and about 5 percent (0.048) others, hence is coded as brown. In this colour-category (brown) are other wards that have at least 60 percent of residents as Christians and these are Chikun Ward 7 (CW7) with about 80 percent (0.797) of its residents as Christians, CW8 with 92 percent (0.920) of its residents as Christians, and CW9 having about 93 percent (0.928) of its residents as Christians. The wards having at least 60 percent of the residents as Muslims are colour-coded green and these are Igabi Ward 7 (IW7) (0.989), Kaduna North Ward 1 (KDNW1) (0.701), KDNW10 (0.622), KDNW11 (0.952), KDNW12 (0.920), KDNW6 (0.873), KDNW7 (0.857), KDNW8 (0.636), KDNW9 (0.931), KDNW10 (0.960), Kaduna South Ward 11 (KDSW11) (0.718), KDSW12 (0.864), KDSW8 (0.718) and KDSW9 (0.929). The wards that do not have any group that is up to 60 percent are coded as yellow and these are KDNW5 and KDSW2. Figure 6.4 shows the spatial pattern of segregation in the metropolis. From the Figure, it can be seen that Kaduna metropolis is largely divided into two parts with Christians and Muslims living on either side of the divide. However, there are mixed communities which are not dominated by any sect, most especially in the southern part of the divide. River Kaduna serves as the divide between the Muslim dominated northern part and the Christian dominated southern part of the metropolis.

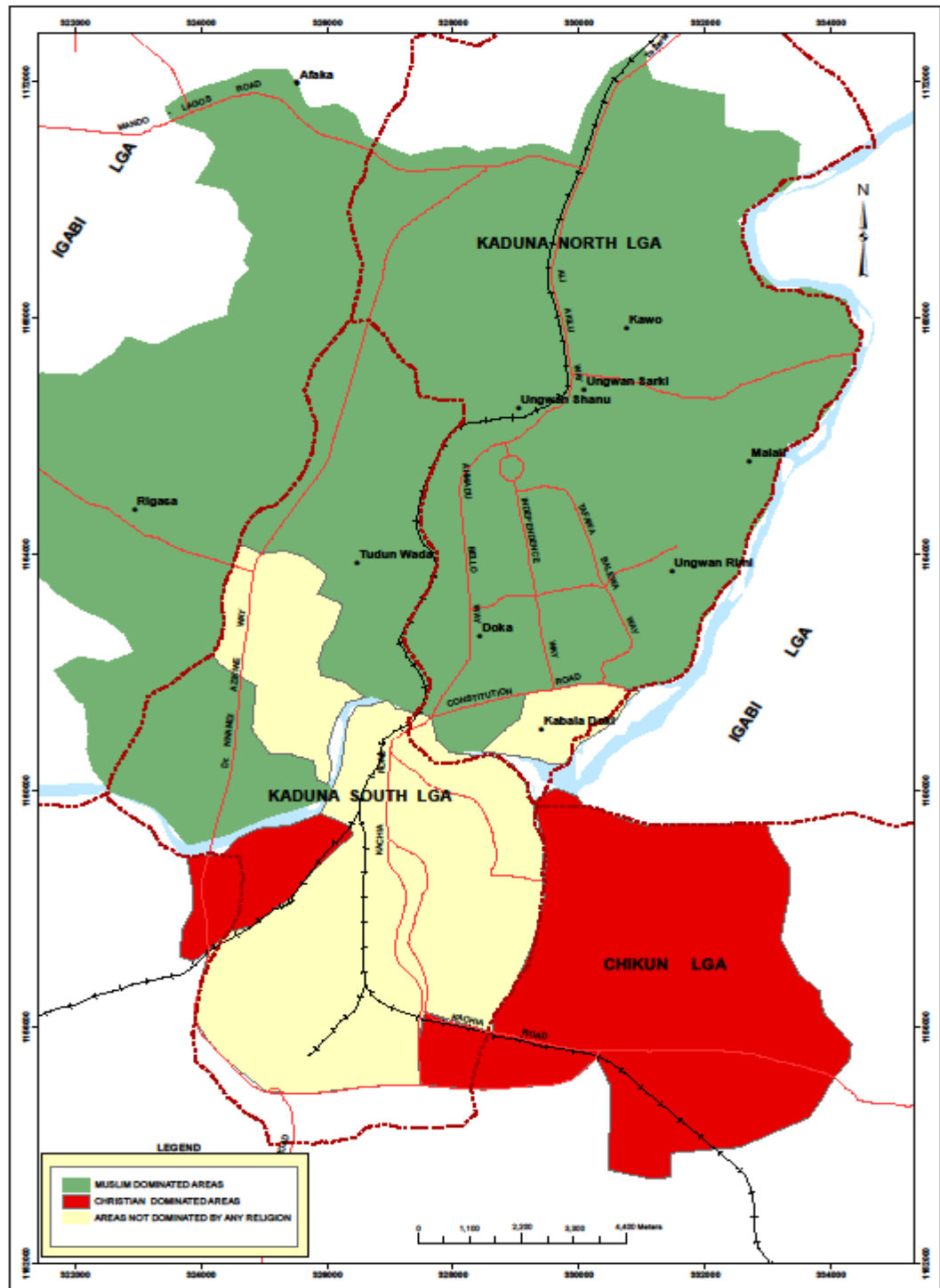
This conforms to Mudashir's (2013) description of how crises created "Makka" and "Jerusalem" in Kaduna, referring to Muslim dominated northern part as "Makka" and Christian dominated southern part as "Jerusalem".

**Table 6.4 Proportion of Households practicing various Religions in Kaduna Metropolis**

<i>S/N</i>	<i>WARD</i>	<i>CHRISTIANITY</i>	<i>ISLAM</i>	<i>TRADITIONAL</i>	<i>OTHERS</i>	<i>CODE</i>
1	CW3	0.904	0.048	0.000	0.048	Brown
2	CW7	0.797	0.203	0.000	0.000	Brown
3	CW8	0.920	0.040	0.40	0.000	Brown
4	CW9	0.928	0.036	0.000	0.036	Brown
5	IW7	0.011	0.989	0.000	0.000	Green
6	KDNW1	0.281	0.701	0.000	0.018	Green
7	KDNW10	0.356	0.622	0.022	0.000	Green
8	KDNW11	0.048	0.952	0.000	0.000	Green
9	KDNW12	0.060	0.920	0.000	0.020	Green
10	KDNW5	0.500	0.500	0.000	0.000	Yellow
11	KDNW6	0.109	0.873	0.018	0.000	Green
12	KDNW7	0.143	0.857	0.000	0.000	Green
13	KDNW8	0.364	0.636	0.000	0.000	Green
14	KDNW9	0.069	0.931	0.000	0.000	Green
15	KDSW10	0.040	0.960	0.000	0.000	Green
16	KDSW11	0.282	0.718	0.000	0.000	Green
17	KDSW12	0.136	0.864	0.000	0.000	Green
18	KDSW2	0.496	0.504	0.000	0.000	Yellow
19	KDSW5	0.000	1.000	0.000	0.000	Green
20	KDSW8	0.282	0.718	0.000	0.000	Green
21	KDSW9	0.071	0.929	0.000	0.000	Green

Source: Households Survey, March 2011

Anele (2014) noted that Islam and Christianity amongst other issues tend to engender division in some Nigerian cities. From Figure 6.4, it can be seen that about 60 percent of landmass in the metropolis is occupied by Muslims and 25 percent occupied by Christians and in the remaining parts both Christians and Muslims are found. The spatial distribution of the various religious groups in Kaduna metropolis is shown in Table 6.5. The table shows the twenty one wards in the metropolis and the distribution of the various religious groups in each of the wards. The number of households that responded was 1020 out of which 57 were from Kaduna North Ward1 (KDNW1). The respondents in this ward were 40 Muslims, 16 Christians and one person who is in the ‘others’ category. The number of respondents from Kaduna North Ward 5 was 38. This comprises 50 percent Christians and 50 percent Muslims. In Kaduna South Ward 5, all the respondents were Muslims. The traditional religion is represented by a respondent each from Kaduna North Ward 6, Kaduna North Ward 10 and Chikun Ward 8. The households practicing other religions are represented by a respondent each from Kaduna North Ward 1, Kaduna North Ward 12, Chikun Ward 9 and three respondents from Chikun Ward 3. In order to determine if the sectarian residential segregation within the city is significant, the analysis of variance was employed to analyse the data in Table 6.5 (See Appendix 7). The summary of the analysis is shown in Table 6.6.



**Fig. 6.4: Residential Segregation Map of Kaduna Metropolis**

(Source: Author's Conceptualization, 2011)

**Table 6.5: Spatial Distribution of Religious Groups in Kaduna Metropolis**

<i>S/N</i>	<i>WARDS</i>	<i>ISLAM</i>	<i>CHRISTIANITY</i>	<i>TRADITIONAL</i>	<i>OTHERS</i>	<i>TOTAL</i>
1	KDNW1	40	16	00	01	57
2	KDNW5	19	19	00	00	38
3	KDNW6	48	06	01	00	55
4	KDNW7	06	01	00	00	07
5	KDNW8	23	10	00	00	33
6	KDNW9	56	02	00	00	58
7	KDNW10	28	16	01	00	45
8	KDNW11	20	01	00	00	21
9	KDNW12	46	03	00	01	50
10	KDSW2	59	58	00	00	117
11	KDSW5	63	00	00	00	63
12	KDSW8	29	10	00	00	39
13	KDSW9	39	03	00	00	42
14	KDSW10	24	01	00	00	25
15	KDSW11	28	11	00	00	39
16	KDSW12	51	08	00	00	59
17	CW3	03	57	00	03	63
18	CW7	08	56	00	00	64
19	CW8	01	23	01	00	25
20	CW9	01	26	00	01	28
21	IW7	91	01	00	00	92
	<b>TOTAL</b>	<b>683</b>	<b>328</b>	<b>03</b>	<b>06</b>	<b>1020</b>

Source: Households Survey, March, 2011



**Table 6.6: ANALYSIS OF VARIANCE RESULTS**

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between Samples	14979	3	4993
Within Samples	18344	80	229.30
<b>TOTAL</b>	<b>33323</b>	<b>83</b>	

To determine if the differences in the distribution of the different groups (Islam, Christianity, Traditional and Others) in the different neighbourhoods is significant, we need to compare the variance estimate for the “between” group (which is 4993) with that for the “within” group (which is 229.30). This comparison is necessary so that it may be possible to decide whether the variance estimates are so dissimilar for us to conclude that significant differences between the samples exist or whether the variance estimates are so alike for us to conclude that the differences within the samples are simply a reflection of the differences within the samples, in which case no significant differences exist between the samples. Snedecor’s variance ratio (F) which is 21.77 was obtained (Appendix 7). We have 4 samples (religious groups) obtained from each of the 21 wards (number of occurrence) within the metropolis, therefore the numerator degree of freedom is  $4 - 1 = 3$  and the denominator degree of freedom is  $84 - 4 = 80$ . We compare the calculated F-ratio (21.77) with the critical value of the F-distribution. With the numerator degree of freedom (3) and denominator degree of freedom (80) at the probability level of 0.05, the critical value of the F-distribution is 2.719 and at the probability level of 0.01 the critical value of the F-distribution is 4.04. Since F-calculated (21.77) is greater than the critical values of F at both  $\alpha = 0.05$  and  $\alpha = 0.01$ , we accept the hypothesis which states that “there is residential segregation along sectarian lines within Kaduna metropolis”

## **CHAPTER SEVEN**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **7.1 Summary**

This study identifies the pattern of intra-city residential mobility in Kaduna metropolis. It also established the rate, the causes and the implications of residential mobility within Kaduna metropolis. The general theoretical literature on residential mobility is inconclusive on several vital questions, hence, this study sought to determine the importance of religion, distance and the impact of mobility on the urban landscape. The study sought to provide answers to certain questions of which the pattern of residential mobility in Kaduna metropolis is one of it. There is a need to ascertain the residential pattern created by mobility in Kaduna metropolis because ethno-religious crises trigger residential dissonance from time to time making people to relocate to preferred areas within the metropolis. The significance effect of this relocation of households as a result of incessant crises is of importance to this study. Hence, this study sought to determine the current pattern of residential mobility within Kaduna metropolis. What is the rate of residential mobility within the metropolis? This question is necessitated by the fact that massive movement of households is noticeable at the end of any ethno-religious crisis in the metropolis. People usually move to areas inhabited by people of similar religion. Therefore, this study sought to determine the rate of the residential mobility within the metropolis. What are the causes of residential mobility? This question is very important because the most important factor that influences residential mobility in Kaduna metropolis is religion which has not been given adequate attention in literature. This study therefore determines to find out the importance of religion and other factors that influence residential mobility of households in the metropolis. What is the relationship between residential choice and neighbourhood characteristics? This question is very important because people's residential choice location is driven by neighbourhood factor in Kaduna metropolis. Another question is what are the implications of residential mobility within the metropolis? This question is borne out of the fact that there is a

noticeable religious residential segregation within the metropolis. Muslims dominate certain parts of the city and likewise Christians dominate other parts of the city which is not a healthy development. This study, therefore, examined the implications of the emerging residential pattern for the effective management of Kaduna metropolis.

In Kaduna metropolis, residential mobility has contributed to the creation of distinct communities with very strong social ties thereby causing residential segregation. The Multigroup Dissimilarity Index shows the extent of the segregation to be fairly high. Residential mobility has inadvertently resulted in marked polarization of the metropolis into Christian and Muslim dominated southern and northern parts with River Kaduna serving as divide between the two parts. In some cases, this is not cost effective because there are households that lives in areas dominated by people of their type of religion for security reasons but may have to travel long distances to their places of work on daily basis, thereby incurring more cost than is necessary. Amongst one thousand and twenty sampled households in the metropolis, four hundred and sixty-six were found to have moved their places of residence at one time or the other. This accounts for about forty-six percent of the households in the sample. More people relocated from Kaduna South Local Government Area to other Local Government Areas. This could be because Kaduna South is the only Local Government Area that is not dominated by any religious group. People felt they might be better protected in the areas dominated by people of same faith with them and therefore relocated to such places. Igabi Local Government Area recorded the smallest number of movements. The volume of movement from Igabi Local Government Area is influenced by the fact that only one ward is covered by this research from the LGA making the sample population to be relatively small.

Many reasons have been given for residential mobility in Kaduna metropolis. They include sharia-related crises, increase in house rent and notice to quit from landlords, cases of marriage, people moving into their own houses and proximity to people's places of work. However, the most important factor of residential mobility in the metropolis is the sharia-related conflicts which account for almost thirty percent of the residential

mobility in the metropolis. This study examined the effects of education, occupation, income, age, sex, marital status, family size, tribe and religious factors on residential mobility in the metropolis. Analysis of the literacy level of mover households reveals that about seventy percent of the households have been educated above primary school level. The cases of self employed members of household were the highly mobile ones in the metropolis. This could be because they were at liberty to choose where they want to site their work-place as well as where to live. This was closely followed by the civil servants. The lower and the middle income group are the highly mobile in Kaduna metropolis and majority of the households are in this group. It is expected that the vibrant youths should be the highly mobile set of people, but against this expectation, the elderly that are above fifty years of age are the highly mobile in the metropolis. This could be because the level of their understanding of the prevailing circumstances in the metropolis supersedes that of the youths. The head of household in Africa is usually a male with the exception of where a woman has lost her husband or in a situation of single parenthood. Hence, this study has confirmed about ninety percent of household heads to be males. Just like other researchers have found out in their studies, over seventy percent of the mover households in Kaduna metropolis are the married ones and it was found that the families with smaller family sizes are highly mobile when compared with those with larger family sizes. This could be because the smaller families might be looking for houses that will accommodate them as they may expand in future.

The logistic regression analysis suggests that religion is the only significant factor of residential mobility within the metropolis. This is a novel contribution to literature on residential mobility. People prefer to relocate to new residences in the areas that are mostly inhabited by people of same religion. In the same vein, religion was the basis for the extent of residential segregation within the metropolis. The Muslims are concentrated in the northern part of the metropolis while the Christians are concentrated in the southern part. Pearson product moment correlation was used to investigate the relationship between movement and distance. The resulting correlation coefficient shows that as distance increases the volume of residential mobility decreases. This means that

people relocate to places not too far from their initial residence. The theoretical cases for migration therefore need to be revisited in order to further understand the basis for residential mobility. The major concept adopted in this study is the “push” and “pull” theory of migration. The study shows that people are generally dissatisfied with living in houses that are located in communities that are dominated by people of religions other than theirs. This implies that sectarian conflict is an important push factor for movement in the metropolis. Households prefer to relocate to areas that are dominated by people of their own religion. The pattern is such that Christians move to areas that are mostly inhabited by Christians and Muslims move to areas that are mostly inhabited by Muslims. This pattern was confirmed by chi-square statistic in the examination of neighbourhood influence on residential choice location. This pattern is consistent with that presented by Lee (1966) that migration process is selective, because different factors affect people’s response to movement. Residential mobility in Kaduna metropolis gives credence to the agent-based modeling of urban segregation as a self-organizing phenomenon. The residential mobility in the metropolis conforms to Schelling’s model of residential tipping which shows how the preferences of autonomous individuals about where to live give rise to aggregate patterns of residential segregation. People believe they are safer when living with people whom they share the same faith with; hence, they relocate to meet them in the area they occupy. The implication is the concentration of people of same religion in some parts of the metropolis, the resultant effect of which is segregation. Also residential mobility within the metropolis conforms to the theoretical explanation of “the longer the distance, the lesser the volume of interaction”. The correlation between the volume of movement and distance in Kaduna is negative. Hence, this research gives credence to “distance-decay-function”.

## **7.2 Conclusion**

The purpose of this study was to analyze intra-city residential mobility in Kaduna metropolis. In order to achieve this aim, it became necessary to identify the pattern of residential mobility in the metropolis, determine the magnitude of the mobility, to identify the role of religion and other factors in residential mobility and to examine the

emerging residential pattern in the metropolis. Relevant models were instrumental to the successful accomplishment of this task. Multigroup dissimilarity index was used to determine the pattern of residential mobility and the mobility was found to have resulted into residential segregation in the metropolis. Simple descriptive statistic shows that about forty-six percent of the residents have relocated in the metropolis within the period of study, while Pearson product moment correlation was used to analyze the volume of movement and the distance covered by the movers. The analysis shows a negative correlation. Logistic regression was used to analyze the socio-economic and cultural factors of the respondents. The result shows that religion is a key factor of residential mobility in Kaduna metropolis. Chi-square statistic was used to analyze the influence of neighbourhood on residential mobility. The result shows that neighbourhood influences residential mobility in Kaduna metropolis.

The current pattern of residential mobility in Kaduna metropolis reveals the polarization of the metropolis along religious identity. This is not a healthy development as it could build mistrust and suspicion among the residents in the metropolis. The polarization will no doubt have some effect on the political landscape of the city. Hence, policies should be put in place that will promote socio-political cohesion and support housing integration. It is necessary to look at the policy options that are desirable for coping with the undesirable aspects of residential segregation. These options could be place-based policies, people – oriented policies or indirect solutions. The place-based policies are directed at encouraging people to live in neighborhoods which they did not previously like. The people oriented policies include increase in affordable houses, improved access to government low-cost housing and improved access to mortgage financing. For instance, the Kaduna State Government is building a millennium city which at completion will be made available to people with diverse socio-cultural backgrounds. Indirect policies will also mitigate the negative effects of residential segregation. For instance, improvement in public transportation will reduce the isolation of minority neighborhoods. The residents that are of the majority group may feel safe because they live in an area occupied by the social group to which they belong. But “beyond the iron

curtain” what does this portend for security? What are the security implications of the challenges posed to peace by segregation? Policies should be put in place that will address these challenges. In addition, policies that will encourage mixed communities will promote understanding in the metropolis.

### **7.3 Recommendation for future research**

The study of residential mobility is extensive and multifaceted therefore there is the need for more case studies. For instance, the concept of ‘redlining’ as a factor of residential mobility and segregation can be investigated in subsequent researches. Redlining, though, a concept of discrimination in the Western world is similar to certain policies in Nigeria. In some cities in the northern part of Nigeria, Kaduna in particular, State Governments prohibit the sale and consumption of alcohol in certain areas of the city. This can make people that either sell or consume alcohol to relocate from such neighbourhoods to areas free of controls. Another example of discrimination is noticed in Ungwa Romi area of Kaduna metropolis where landed properties are not sold or leased to Muslims. It will be worthwhile for this issue to be investigated, particularly the spirit behind this practice and its effect on residential patterns.



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## Appendix 1

UNIVERSITY OF IBADAN, DEPARTMENT OF GEOGRAPHY, SURVEY OF  
RESIDENTIAL MOBILITY IN KADUNA METROPOLIS

### SECTION A: LOCATION

- 1 House Number-----  
2 Name of locality-----  
3 Name of Ward-----  
4 Name of LGA-----

### SECTION B: SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENT

- 5 Age of head of household in years -----  
6 Sex            Male       Female   
7 Educational attainments  
    i. None   
    ii. Primary Certificate   
    iii. Secondary Certificate   
    iv. OND/NCE   
    v. Graduate/HND    
    vi. Post Graduate   
    vii. Others, specify -----  
8 Nature of occupation  
    i. Civil servant   
    ii. Company Worker   
    iii. Self employed   
    iv. Unemployed   
    v. Others, specify -----

9 How much is your salary per Month? -----

10 Marital Status

i. Single

ii. Married

iii. Divorced

iv. Widowed

11 Number of members of Household

· Male -----

· Female -----

· Total -----

12 What tribe are you? -----

13 What is your religion?

i. Christianity

ii. Islam

iii. Traditional Religion

iv. Others, specify -----

### SECTION C: RESIDENTIAL CHOICE

14 Name the ethnic groups resident in this locality -----

15 Name the dominant ethnic group in this locality -----

16 What is the dominant religious affiliation of the people in this locality?

a. Christianity

b. Islam

c. Traditional religion

d. Others specify -----

17 The type of house

i. A room

ii. A room and parlour

iii. Self Contained apartment

iv. Two bedrooms flat

v. Three bedrooms flat

vi. A bungalow

vii. A duplex

viii. Others, specify-----

18 Do you own this house or a tenant? Own  Tenant

19 If tenant, how much do you pay per annum? -----

20 How long have you resided in this house? -----

21 Have you lived anywhere else in Kaduna, other than your present residence? Yes

No

22 With reference to Q21, if yes, where did you live before moving into your present residence? -----

23 With reference to Q21, if yes, how much do you pay per annum at your last residence before here? -----

24 With reference to Q21, if yes, why did you move from your last residence? -----  
-----

25 How did you get the initial information about this place?

i. through relatives

ii. through friends

iii. through newspapers

iv. through bill boards

v. through co-workers

vi. through personal search

vii. through realtors

viii. by chance

ix. others, specify -----

26 What is the most important reason for choosing to live in the present locality?

Please choose as applicable

i Safety of lives and property

ii To be close to my ethnic group

iii To be close to my religious group

iv To be close to my place of work

v Move into my own house

vi Availability of cheap accommodation

vii. Others, specify-----

27 Is this house sufficient for your family? Yes  No

28 With reference to Q27, give reasons for your answer-----

29 Are you satisfied with this locality? Yes  No

30 With reference to Q29 give reasons for your answer -----

31 Will you like to change residence in the future? Yes  No

32 With reference to Q31 above, give reasons for your answer -----

Thank you.

Name of interviewer -----

Date ----- Signature -----

## Appendix 2

### QUESTIONNAIRE TO BE ADMINISTERED ONLY TO THE REALTORS

1 Name of Realtor -----

2 Address of Realtor -----

3 Name of locality -----

4 Name of ward -----

5 Name of LGA -----

6 What is the average rent in Naira per annum in this locality? -----

i. A room -----

ii. A room and parlour -----

iii Self Contained apartment -----

iv. Two bedrooms flat -----

v. Three bedrooms flat -----

vi. A bungalow -----

vii. A duplex -----

viii. Others, specify -----

7 Are people attracted to this locality?      Yes            No     

8 With reference to Q7 give reasons -----

9 What are the factors that affect values of land and property in this locality? -----

-----

Thank you.

Name of interviewer -----

Date ----- Signature -----

## Appendix 3

### LOGISTIC REGRESSION OUTPUT

```
LOGISTIC REGRESSION VARIABLES moved2
/METHOD=ENTER q5 q9 q11c q7 q8 q10 q12 q13
/CONTRAST (q7) = Indicator (1)
/CONTRAST (q8) = Indicator (1)
/CONTRAST (q10) = Indicator (1)
/CONTRAST (q12) = Indicator (1)
/CONTRAST (q13) = Indicator
/CLASSPLOT
/CASEWISE
/PRINT = GOODFIT CORR ITER (1) CI (95)
/CRITERIA = PIN (0.05) POUT (0.10) ITERATE (20) CUT (0.5)
```

#### Logistic Regression

[DataSet3] C:\Users\USER\Desktop\testing2.sav

#### Case Processing Summary

Unweighted Cases <sup>a</sup>		N	Percent
Selected Cases	Included in Analysis	779	76.4
	Missing Cases	241	23.6
	Total	1020	100.0
Unselected Cases		0	0
Total		1020	100.0

a. If weight is in effect, see classification table for the total number of cases

**Dependent Variable Encoding**

Original Value	Internal Value
0 no	0
1 yes	1

**Categorical Variables Codings**

	Frequency	Parameter Coding						
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
q7	4	.000	.000	.000	.000	.000	.000	.000
Graduate	157	1.000	.000	.000	.000	.000	.000	.000
None	140	.000	1.000	.000	.000	.000	.000	.000
OND/NCE	175	.000	.000	1.000	.000	.000	.000	.000
Others	6	.000	.000	.000	1.000	.000	.000	.000
Post Gra	25	.000	.000	.000	.000	1.000	.000	.000
Pry Cert	81	.000	.000	.000	.000	.000	1.000	.000
Secondar	191	.000	.000	.000	.000	.000	.000	1.000
q12	26	.000	.000	.000	.000	.000		
Fulani	58	1.000	.000	.000	.000	.000		
Hausa	328	.000	1.000	.000	.000	.000		
Igbo	37	.000	.000	1.000	.000	.000		
Others	246	.000	.000	.000	1.000	.000		
Yoruba	84	.000	.000	.000	.000	1.000		
q8	2	.000	.000	.000	.000	.000		
Civil Se	265	1.000	.000	.000	.000	.000		
Company	87	.000	1.000	.000	.000	.000		
Others	41	.000	.000	1.000	.000	.000		
Self emp	368	.000	.000	.000	1.000	.000		
Unemploy	16	.000	.000	.000	.000	1.000		
q10	3	.000	.000	.000	.000			
Divorced	20	1.000	.000	.000	.000			
Married	586	.000	1.000	.000	.000			
Single	130	.000	.000	1.000	.000			
Widowed	40	.000	.000	.000	1.000			
q13	252	1.000	.000	.000				
Christia	252	1.000	.000	.000				
Islam	521	.000	1.000	.000				
Others	4	.000	.000	1.000				
Trad.	2	.000	.000	.000				



## Block 0: Beginning Block

Classification Table<sup>a,b</sup>

		Predicted		
		Moved 2		Percentage Correct
		0 no	1 yes	
Step 0		411	0	100.0
moved 2	0 no	368	0	.0
	1 yes			52.8
Overall Percentage				

- a. Constant is included in the model.  
 b. The cut value is .500

Variables in the Equation

		B	S.E	Wald	Df	Sig.	Exp(B)
Step 0	Constant	-111	.072	2.371	1	.124	.895

## Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	59.152	27	.000
	Block	59.152	27	.000
	Model	59.152	27	.000

**Model Summary**

Step	-2 Log likelyhood	Cox & Snell R Square	Nagelkerke R Square
1	1018.397 <sup>a</sup>	.073	.098

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

**Hosmer and Lemeshow Test**

Step	Chi-square	df	Sig.
1	5.282	8	.727

**Contingency Table for Hosmer and Lemeshow Test**

		Moved2 = 0		Moved2 = 1		Total
		Observed	Expected	Observed	Expected	
Step 1	1	58	60.004	20	17.996	78
	2	57	49.969	21	28.031	78
	3	46	47.226	32	30.774	78
	4	39	45.099	39	32.901	78
	5	43	42.985	35	35.015	78
	6	41	40.481	37	37.519	78
	7	38	37.282	40	40.718	78
	8	36	34.298	42	43.702	78
	9	30	30.338	48	47.662	78
	10	23	23.318	54	53.682	77

**Classification Table<sup>a</sup>**

Observed		Predicted		
		Moved 2		Percentage Correct
		0 no	1 yes	
Step 1		282	129	68.6
moved 2	0 no	181	187	50.8
	1 yes			60.2
Overall Percentage				

a. The cut value is .500

**Variables in the Equation**

	B	S.E	Wald	df	Sig.	Exp(B)	95% C.I. for EXP (B)	
							Lower	Upper
Step 1 <sup>a</sup> q5age	.009	.009	1.131	1	.288	1.009	.992	1.026
q9income	.000	.000	.072	1	.788	1.000	1.000	1.000
q11chsiz	-.035	.021	2.836	1	.092	.966	.928	1.006
q7edu			13.662	7	.058			
q7edu (1)	-21.924	19924.904	.000	1	.999	.000	.000	
q7edu (2)	-21.661	19924.904	.000	1	.999	.000	.000	
q7edu (3)	-21.436	19924.904	.000	1	.999	.000	.000	
q7edu (4)	-22.867	19924.904	.000	1	.999	.000	.000	
q7edu (5)	-20.939	19924.904	.000	1	.999	.000	.000	
q7edu (6)	-21.156	19924.904	.000	1	.999	.000	.000	
q7edu (7)	-21.305	19924.904	.000	1	.999	.000	.000	
q8occup			.9.078	5	.106			
q8occup (1)	21.315	28296.945	.000	1	.999	1.808	.000	
q8occup (2)	21.153	28296.945	.000	1	.999	1.537	.000	
q8occup (3)	20.882	28296.945	.000	1	.999	1.173	.000	
q8occup (4)	20.884	28296.945	.000	1	.999	1.175	.000	
q8occup (5)	19.427	28296.945	.000	1	.999	2.736	.000	
q10mstat			3.063	4	.547			
q10mstat (1)	.124	1.354	.008	1	.927	1.133	.080	16.102
q10mstat (2)	.859	1.250	.472	1	.492	2.361	.204	27.368
q10mstat (3)	.756	1.270	.354	1	.552	2.129	.177	25.659
q10mstat (4)	.556	1.300	.183	1	.669	1.743	.i36	22.270
q12tribe			2.477	5	.780			
q12tribe (1)	.351	.522	.453	1	.501	1.421	.511	3.953
q12tribe (2)	.548	.462	1.405	1	.236	1.730	.699	4.280
q12tribe (3)	.553	.554	.997	1	.318	1.739	.587	5.152
q12tribe (4)	.324	.455	.505	1	.477	1.382	.566	3.374
q12tribe (5)	.364	.492	.546	1	.460	1.439	.548	3.776
q13relig			10.980	3	.012			
q13relig (1)	-.149	1.493	.010	1	.920	.862	.046	16.070
q13relig (2)	-.763	1.498	.260	1	.610	.466	.025	8.774
q13relig (3)	.813	1.888	.186	1	.667	2.255	.056	91.152
Constant	-.479	34605.290	.000	1	1.000	.619		

## Appendix 4

### SOCIO-ECONOMIC AND DEMOGRAPHIC DATA OF THE MOVERS

Educational Status of Mover Households in Kaduna North LGA

<i>Education</i>	<i>W1</i>	<i>W5</i>	<i>W6</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
Non formal	1	-	5	-	1	1	4	-	-	12	9.45
Primary	1	-	1	-	1	1	1	-	2	7	5.51
Secondary	6	-	2	2	1	6	6	3	9	35	27.56
OND/NCE	4	6	3	1	4	6	4	-	8	36	28.35
Grad/HND	6	1	9	-	4	5	1	-	3	29	22.83
Post Grad	2	1	1	-	1	2	-	-	1	8	6.30
<b>Total</b>	<b>20</b>	<b>8</b>	<b>21</b>	<b>3</b>	<b>12</b>	<b>21</b>	<b>16</b>	<b>3</b>	<b>23</b>	<b>127</b>	<b>100</b>

Educational Status of Mover Households in Kaduna South LGA

<i>Education</i>	<i>W2</i>	<i>W5</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
Non formal	15	9	4	2	3	2	4	39	21.31
Primary	7	8	1	-	1	3	4	24	13.11
Secondary	18	5	2	6	1	5	5	42	22.95
OND/NCE	5	2	7	1	5	11	9	40	21.86
Grad/HND	9	5	4	4	2	1	7	32	17.49
Post Grad	-	-	2	1	1	-	2	6	3.28
<b>Total</b>	<b>54</b>	<b>29</b>	<b>20</b>	<b>14</b>	<b>13</b>	<b>22</b>	<b>31</b>	<b>183</b>	<b>100</b>

Educational Status of Mover Households in Chikun LGA

<i>Education</i>	<i>W3</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>Total</i>	<i>Percentage</i>
Non formal	2	4	5	-	11	10.28
Primary	3	8	3	1	15	14.02
Secondary	15	9	5	8	37	34.58
OND/NCE	3	9	4	4	20	18.69
Grad/HND	7	4	-	6	17	15.89
Post Grad	4	-	-	3	7	6.54
Total	34	34	17	22	107	100

Educational Status of Mover Households in Igabi LGA.

<i>Education</i>	<i>W7</i>	<i>Percentage</i>
Non formal	17	34.69
Primary	7	14.29
Secondary	15	30.61
OND/NCE	7	14.29
Grad/HND	2	4.08
Post Grad	1	2.04
Total	49	100

Occupational Distribution of Mover Households in Kaduna North LGA

<i>Occupation</i>	<i>W1</i>	<i>W5</i>	<i>W6</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
Civil Servant	8	6	9	1	10	9	4	-	11	58	45.67
Company/ Industrial worker	-	-	1	-	-	5	1	2	-	9	7.09
Self Employed	11	1	8	2	2	6	10	1	12	53	41.73
Unemployed	-	1	3	-	-	1	1	-	-	6	4.72
Others	-	-	-	-	-	-	-	-	-	1	0.79
<b>Total</b>	<b>20</b>	<b>8</b>	<b>21</b>	<b>3</b>	<b>12</b>	<b>21</b>	<b>16</b>	<b>3</b>	<b>23</b>	<b>127</b>	<b>100</b>

Occupational Distribution of Mover Households in Kaduna South LGA

<i>Occupation</i>	<i>W2</i>	<i>W5</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
Civil Servant	10	13	10	4	6	7	14	64	34.97
Company/ Industrial worker	16	2	-	1	1	1	3	24	13.12
Self Employed	26	14	7	7	6	12	12	84	45.90
Unemployed	2	-	3	2	-	2	2	11	6.01
Others	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>54</b>	<b>29</b>	<b>20</b>	<b>14</b>	<b>13</b>	<b>22</b>	<b>31</b>	<b>183</b>	<b>100</b>

Occupational Distribution of Mover Households in Chikun LGA

<i>Occupation</i>	<i>W3</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>Total</i>	<i>Percentage</i>
Civil Servant	9	4	7	10	30	28.04
Company/ Industrial worker	3	12	2	2	19	17.76
Self Employed	22	14	6	8	50	46.73
Unemployed	-	4	2	2	8	7.47
Others	-	-	-	-	-	-
<b>Total</b>	<b>34</b>	<b>34</b>	<b>17</b>	<b>22</b>	<b>107</b>	<b>100</b>

Occupational Distribution of Mover Households in Igabi LGA

<i>Occupation</i>	<i>W7</i>	<i>Percentage</i>
Civil Servant	11	22.45
Company/ Industrial worker	3	6.12
Self Employed	29	59.18
Unemployed	6	12.25
Others	-	-
<b>Total</b>	<b>49</b>	<b>100</b>

Income of Movers in Kaduna North LGA

<i>Income (₦) Per Month</i>	<i>W1</i>	<i>W5</i>	<i>W6</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
≤ 18000	3	3	5	2	4	3	6	-	6	32	25.20
19000-36000	3	1	9	-	4	7	5	1	10	40	31.49
37000-54000	2	1	3	1	1	6	3	2	4	23	18.11
≥ 55000	12	3	4	-	3	5	2	-	3	32	25.20
<b>Total</b>	<b>20</b>	<b>8</b>	<b>21</b>	<b>3</b>	<b>12</b>	<b>21</b>	<b>16</b>	<b>3</b>	<b>23</b>	<b>127</b>	<b>100</b>

Income of Movers in Kaduna South LGA

<i>Income (₦) Per Month</i>	<i>W2</i>	<i>W5</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
≤ 18000	20	1	10	5	6	14	13	69	37.70
19000-36000	14	14	1	5	3	3	6	46	25.14
37000-54000	17	9	6	3	2	3	6	46	25.14
≥ 55000	3	5	3	1	2	2	6	22	12.02
<b>Total</b>	<b>54</b>	<b>29</b>	<b>20</b>	<b>14</b>	<b>13</b>	<b>22</b>	<b>31</b>	<b>183</b>	<b>100</b>

Income of Movers in Chikun LGA

<i>Income (₦) Per Month</i>	<i>W3</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>Total</i>	<i>Percentage</i>
≤ 18000	21	13	6	10	50	46.73
19000-36000	5	13	5	7	30	28.04
37000-54000	5	4	6	1	16	14.95
≥ 55000	3	4	-	4	11	10.28
<b>Total</b>	<b>34</b>	<b>34</b>	<b>17</b>	<b>22</b>	<b>107</b>	<b>100</b>



Income of Movers in Igabi LGA

<i>Income (₦) Per Month</i>	<i>W7</i>	<i>Percentage</i>
≤ 18000	16	32.65
19000-36000	22	44.90
37000-54000	9	18.37
≥ 55000	2	4.08
<b>Total</b>	<b>49</b>	<b>100</b>

Age Group of Movers in Kaduna North Local Government Area Wards (W)

<i>Age group</i>	<i>W1</i>	<i>W5</i>	<i>W6</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
26-30	2	5	2	-	2	2	2	-	7	22	17.30
31-35	5	2	5	2	-	9	7	2	3	35	27.50
36-40	3	1	4	1	3	4	4	1	6	27	21.30
41-45	3	-	3	-	1	-	2	-	2	11	8.70
46-50	2	-	1	-	2	4	1	-	1	11	8.70
≥ 51	5	-	6	-	4	2	-	-	4	21	16.50
<b>Total</b>	<b>20</b>	<b>8</b>	<b>21</b>	<b>3</b>	<b>12</b>	<b>21</b>	<b>16</b>	<b>3</b>	<b>23</b>	<b>127</b>	<b>100</b>

Age Group of Movers in Kaduna South Local Government Area Wards (W)

<i>Age group</i>	<i>W2</i>	<i>W5</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
21-25	-	1	1	-	-	2	1	5	2.70
26-30	9	-	3	2	4	4	3	25	13.70
31-35	9	1	4	5	1	2	3	25	13.70
36-40	7	4	2	-	2	5	5	25	13.70
41-45	3	-	4	3	3	2	7	22	12.00
46-50	12	8	6	1	1	4	5	37	20.20
≥ 51	14	15	-	3	2	3	7	44	24.00
<b>Total</b>	<b>54</b>	<b>29</b>	<b>20</b>	<b>14</b>	<b>13</b>	<b>22</b>	<b>31</b>	<b>183</b>	<b>100</b>

Age Group of Movers in Chikun Local Government Area

<i>Age group</i>	<i>W3</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>Total</i>	<i>Percentage</i>
≤ 20	1	-	-	2	3	2.80
21-25	3	2	-	2	7	6.54
26-30	3	4	-	1	8	7.48
31-35	9	6	1	2	18	16.82
36-40	1	6	3	5	15	14.02
41-45	7	6	1	5	19	17.76
46-50	4	3	4	2	13	12.15
≥ 51	6	7	8	3	24	22.43
<b>Total</b>	<b>34</b>	<b>34</b>	<b>17</b>	<b>22</b>	<b>107</b>	<b>100</b>

Intra-urban Movers by Sex in Kaduna North LGA

<i>SEX</i>	<i>W1</i>	<i>W5</i>	<i>W6</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
Male	18	6	18	3	11	19	14	3	22	114	89.80
Female	2	2	3	-	1	2	2	-	1	13	10.20
Total	20	8	21	3	12	21	16	3	23	127	100

Intra-urban Movers by Sex in Kaduna South LGA

<i>SEX</i>	<i>W2</i>	<i>W5</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
Male	48	23	16	14	12	20	27	160	87.43
Female	6	6	4	-	1	2	4	23	12.57
Total	54	29	20	14	13	22	31	183	100

Intra Urban Movers by Sex in Chikun LGA

<i>SEX</i>	<i>W3</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>Total</i>	<i>Percentage</i>
Male	32	33	15	22	102	95.3
Female	2	1	2	-	5	4.7
Total	34	34	17	22	107	100

Intra-urban Movers by Sex in Igabi LGA.

<i>SEX</i>	<i>W7</i>	<i>Percentage</i>
Male	43	87.76
Female	6	12.24
Total	49	100

Intra Urban Movers by Sex in Chikun LGA

<i>SEX</i>	<i>W3</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>Total</i>	<i>Percentage</i>
Male	32	33	15	22	102	95.3
Female	2	1	2	-	5	4.7
Total	34	34	17	22	107	100

Intra-urban Movers by Sex in Igabi LGA

<i>SEX</i>	<i>W7</i>	<i>Percentage</i>
Male	43	87.76
Female	6	12.24
Total	49	100

Intra-urban Movers by Marital Status in Kaduna North LGA

<i>Marital Status</i>	<i>W1</i>	<i>W5</i>	<i>W6</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
Single	4	3	5	2	2	5	6	-	3	30	23.62
Married	15	3	13	1	10	13	8	3	20	86	67.71
Divorced	-	-	1	-	-	-	-	-	-	1	0.80
Widowed	1	2	2	-	-	3	2	-	-	10	7.87
Total	20	8	21	3	12	21	16	3	23	127	100

Intra-urban Movers by Marital Status in Kaduna South LGA

<i>Marital Status</i>	<i>W2</i>	<i>W5</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
Single	14	3	4	2	2	4	2	31	16.94
Married	34	21	13	12	11	16	28	135	73.77
Divorced	3	-	-	-	-	-	-	3	1.64
Widowed	3	5	3	-	-	2	1	14	7.65
Total	54	29	20	14	13	22	31	183	100

Intra-urban Movers by Marital Status in Chikun LGA

<i>Marital Status</i>	<i>W3</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>Total</i>	<i>Percentage</i>
Single	12	7	1	6	26	24.30
Married	19	27	16	16	78	72.90
Divorced	-	-	-	-	-	-
Widowed	3	-	-	-	3	2.80
Total	34	34	17	22	107	100

Intra-urban Movers by Marital Status in Igabi LGA

<i>Marital status</i>	<i>W7</i>	<i>Percentage</i>
Single	2	4.08
Married	44	89.80
Divorced	2	4.08
Widowed	1	2.04
Total	49	100

Family Size and Residential Mobility in Kaduna North LGA

<i>Family Size</i>	<i>W1</i>	<i>W5</i>	<i>W6</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
1-5	9	6	11	2	5	12	10	3	13	71	55.91
6-10	9	2	4	1	5	8	5	-	8	42	33.07
≥ 11	2	-	6	-	2	1	1	-	2	14	11.02
Total	20	8	21	3	12	21	16	3	23	127	100

Family Size and Residential Mobility in Kaduna South LGA

<i>Family size</i>	<i>W2</i>	<i>W5</i>	<i>W8</i>	<i>W9</i>	<i>W10</i>	<i>W11</i>	<i>W12</i>	<i>Total</i>	<i>Percentage</i>
1-5	23	21	9	5	8	14	13	93	50.82
6-10	25	7	8	7	4	5	8	64	34.97
≥ 11	6	1	3	2	1	3	10	26	14.21
Total	54	29	20	14	13	22	31	183	100

Family Size and Residential Mobility in Chikun LGA

<i>Family size</i>	<i>W3</i>	<i>W7</i>	<i>W8</i>	<i>W9</i>	<i>Total</i>	<i>Percentage</i>
1-5	24	21	4	17	66	61.68
6-10	10	11	11	5	37	34.58
≥ 11	-	2	2	-	4	3.74
Total	34	34	17	22	107	100

Family Size and Residential Mobility in Igabi LGA.

<i>Family size</i>	<i>W7</i>	<i>Percentage</i>
1-5	17	34.69
6-10	20	40.82
$\geq 11$	12	24.49
Total	49	100

## Appendix 5

### Distances Moved by Households in Kaduna Metropolis

S/N	Dist (km)	Mover Households	S/N	Dist (km)	Mover Households	S/N	Dist (km)	Mover Households
1	0.00	33	33	3.90	10	65	7.60	2
2	0.20	20	34	4.00	22	66	7.70	1
3	0.30	2	35	4.10	5	67	7.80	2
4	0.50	1	36	4.20	4	68	8.00	7
5	0.60	1	37	4.30	4	69	8.20	9
6	0.80	1	38	4.40	3	70	8.30	1
7	1.10	1	39	4.50	2	71	8.40	2
8	1.20	11	40	4.60	11	72	8.50	2
9	1.30	26	41	4.70	1	73	8.60	3
10	1.40	1	42	4.80	1	74	8.80	7
11	1.60	2	43	4.90	2	75	8.90	1
12	1.70	3	44	5.00	8	76	9.00	6
13	1.80	6	45	5.10	4	77	9.20	8
14	1.90	2	46	5.20	1	78	9.30	2
15	2.00	8	47	5.30	3	79	9.50	1
16	2.10	3	48	5.40	4	80	10.30	3
17	2.20	7	49	5.50	6	81	10.60	1
18	2.30	3	50	5.80	3	82	10.80	1
19	2.40	1	51	5.90	6	83	10.90	1
20	2.50	8	52	6.00	13	84	11.10	1
21	2.60	13	53	6.10	3	85	11.40	2
22	2.70	2	54	6.20	7	86	11.50	2
23	2.80	3	55	6.30	6	87	11.60	1
24	2.90	4	56	6.50	7	88	11.80	8
25	3.00	8	57	6.60	3	89	11.90	1
26	3.10	7	58	6.70	1	90	12.00	7
27	3.20	8	59	6.80	2	91	12.10	5
28	3.30	3	60	7.00	9	92	12.20	2
29	3.50	1	61	7.10	1	93	12.30	2
30	3.60	11	62	7.20	1	94	13.80	2
31	3.70	2	63	7.30	12	95	14.00	1
32	3.80	3	64	7.40	1	96	15.20	1
							<b>TOTAL</b>	<b>466</b>

Source: Households Survey, March 2011



## Appendix 6

### Correlation of Residential Mobility and Distance

S/N	Dist (km) x	Households y	$x - \bar{x}$	$(x - \bar{x})^2$	$y - \bar{y}$	$(y - \bar{y})^2$	$(x - \bar{x})(y - \bar{y})$
1	0.00	33	-6.0	36.00	28	784	-168
2	0.20	20	-5.8	33.64	15	225	-87
3	0.30	2	-5.7	32.49	-3	9	17.1
4	0.50	1	-5.5	30.25	-4	16	22
5	0.60	1	-5.4	29.16	-4	16	21.6
6	0.80	1	-5.2	27.04	-4	16	20.8
7	1.10	1	-4.9	24.01	-4	16	19.6
8	1.20	11	-4.8	23.04	6	36	-28.8
9	1.30	26	-4.7	22.09	21	441	-98.7
10	1.40	1	-4.6	21.16	-4	16	18.4
11	1.60	2	-4.4	19.36	-3	9	13.2
12	1.70	3	-4.3	18.49	-2	4	8.6
13	1.80	6	-4.2	17.64	1	1	-4.2
14	1.90	2	-4.1	16.81	-3	9	12.3
15	2.00	8	-4.0	16.00	3	9	-12
16	2.10	3	-3.9	15.21	-2	4	7.8
17	2.20	7	-3.8	14.44	2	4	-7.6
18	2.30	3	-3.7	13.69	-2	4	7.4
19	2.40	1	-3.6	12.96	-4	16	14.4
20	2.50	8	-3.5	12.25	3	9	-10.5
21	2.60	13	-3.4	11.56	8	64	-27.2
22	2.70	2	-3.3	10.89	-3	9	9.9
23	2.80	3	-3.2	10.24	-2	4	6.4
24	2.90	4	-3.1	9.61	-1	1	3.1
25	3.00	8	-3.0	9.00	3	9	-9
26	3.10	7	-2.9	8.41	2	4	-5.8
27	3.20	8	-2.8	7.84	3	9	-8.4
28	3.30	3	-2.7	7.29	-2	4	5.4
29	3.50	1	-2.5	6.25	-4	16	10
30	3.60	11	-2.4	5.76	6	36	-14.4
31	3.70	2	-2.3	5.29	-3	9	6.9
32	3.80	3	-2.2	4.84	-2	4	4.4
33	3.90	10	-2.1	4.41	5	25	-10.5
34	4.00	22	-2.0	4.00	17	289	-34
35	4.10	5	-1.9	3.61	0	0	0
36	4.20	4	-1.8	3.24	-1	1	1.8
37	4.30	4	-1.7	2.89	-1	1	1.7
38	4.40	3	-1.6	2.56	-2	4	3.2
39	4.50	2	-1.5	2.25	-3	9	4.5
40	4.60	11	-1.4	1.96	6	36	-8.4

41	4.70	1	-1.3	1.69	-4	16	5.2
42	4.80	1	-1.2	1.44	-4	16	4.8
43	4.90	2	-1.1	1.21	-3	9	3.3
44	5.00	8	-1.0	1.00	3	9	-3
45	5.10	4	-0.9	0.81	-1	1	0.9
46	5.20	1	-0.8	0.64	-4	16	3.2
47	5.30	3	-0.7	0.49	-2	4	1.4
48	5.40	4	-0.6	0.36	-1	1	0.6
49	5.50	6	-0.5	0.25	1	1	-0.5
50	5.80	3	-0.2	0.04	-2	4	0.4
51	5.90	6	-0.1	0.01	1	1	-0.1
52	6.00	13	0.0	0.00	8	64	0
53	6.10	3	0.1	0.01	-2	4	-0.2
54	6.20	7	0.2	0.04	2	4	0.4
55	6.30	6	0.3	0.09	1	1	0.3
56	6.50	7	0.5	0.25	2	4	1
57	6.60	3	0.6	0.36	-2	4	-1.2
58	6.70	1	0.7	0.49	-4	16	-2.8
59	6.80	2	0.8	0.64	-3	9	-2.4
60	7.00	9	1.0	1.00	4	16	4
61	7.10	1	1.1	1.21	-4	16	-4.4
62	7.20	1	1.2	1.44	-4	16	-4.8
63	7.30	12	1.3	1.69	7	49	9.1
64	7.40	1	1.4	1.96	-4	16	-5.6
65	7.60	2	1.6	2.56	-3	9	-4.8
66	7.70	1	1.7	2.89	-4	16	-6.8
67	7.80	2	1.8	3.24	-3	9	-5.4
68	8.00	7	2.0	4.00	2	4	4
69	8.20	9	2.2	4.84	4	16	8.8
70	8.30	1	2.3	5.29	-4	16	-9.2
71	8.40	2	2.4	5.76	-3	9	-7.2
72	8.50	2	2.5	6.25	-3	9	-7.5
73	8.60	3	2.6	6.76	-2	4	-5.2
74	8.80	7	2.8	7.84	2	4	5.6
75	8.90	1	2.9	8.41	-4	16	-11.6
76	9.00	6	3.0	9.00	1	1	3
77	9.20	8	3.2	10.24	3	9	9.6
78	9.30	2	3.3	10.89	-3	9	-9.9
79	9.50	1	3.5	12.25	-4	16	-14
80	10.30	3	4.3	18.49	-2	4	-8.6
81	10.60	1	4.6	21.16	-4	16	-18.4
82	10.80	1	4.8	23.04	-4	16	-19.2
83	10.90	1	4.9	24.01	-4	16	-19.6
84	11.10	1	5.1	26.01	-4	16	-20.4

85	11.40	2	5.4	29.16	-3	9	-16.2
86	11.50	2	5.5	30.25	-3	9	-16.5
87	11.60	1	5.6	31.36	-4	16	-22.4
88	11.80	8	5.8	33.64	3	9	17.4
89	11.90	1	5.9	34.81	-4	16	-23.6
90	12.00	7	6.0	36.00	2	4	12
91	12.10	5	6.1	37.21	0	0	0
92	12.20	2	6.2	38.44	-3	9	-18.6
93	12.30	2	6.3	39.69	-3	9	-18.9
94	13.80	2	7.8	60.84	-3	9	-23.4
95	14.00	1	8.0	64.00	-4	16	-32
96	15.20	1	9.2	84.64	-4	16	-36.8
	$\bar{x} = 6$	$\bar{y} = 5$		1272.08		2812	-600.20

The Pearson product moment correlation coefficient,  $r$ , is given by

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sigma_x \cdot \sigma_y}$$

which means that  $r$  is given by the covariance of  $x$  and  $y$  divided by the standard deviation of  $x$  multiplied by the standard deviation of  $y$ .

$$\text{The } \sigma_x = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n}} \quad \text{and} \quad \sigma_y = \sqrt{\frac{\sum (y_i - \bar{y})^2}{n}}$$

$$\text{Therefore } r = \frac{\sum (-600.20)}{96 \cdot \sigma_x} \quad \text{where } \sigma_x = \sqrt{\frac{1272.08}{96}} = \sqrt{13.25} = 3.64$$

$$\text{and } \sigma_y = \sqrt{\frac{2812}{96}} = \sqrt{29.29} = 5.41$$

$$r = \frac{\sum (-600.20)}{3.64 \times 5.41} = \frac{-6.25}{19.69}$$

$$r = -0.317$$

### Test for the Significance of r

For this testing we utilize the Student's t distribution

$$t \text{ is given by } t = \frac{r \cdot \sqrt{n-2}}{\sqrt{1-r^2}}$$

Where n is the number of observations and n-2 are the degrees of freedom. In this our study, with 96 observations, the degree of freedom is  $96 - 2 = 94$ . This is because we lose one degree in each of the two variables x and y. Given our calculated product moment correlation coefficient, r, of -0.317, the t value will be

$$t = \frac{0.317 \sqrt{96-2}}{\sqrt{1-0.317^2}}$$

The minus sign has been ignored because in significance testing of the correlation coefficient, as distinct from the meaning of the coefficient, the sign may be conveniently ignored.

$$t = \frac{0.317 \times 9.69}{0.948}$$

$$t = \frac{3.072}{0.948}$$

$$t = 3.24$$

## Appendix 7

### ANALYSIS OF VARIANCE

#### SAMPLE RELIGIONS

S/N	WARDS	ISLAM (X <sub>1</sub> )	CHRISTIANITY (X <sub>2</sub> )	TRADITIONAL (X <sub>3</sub> )	OTHERS (X <sub>4</sub> )
1	KDNW1	40	16	00	01
2	KDNW5	19	19	00	00
3	KDNW6	48	06	01	00
4	KDNW7	06	01	00	00
5	KDNW8	23	10	00	00
6	KDNW9	56	02	00	00
7	KDNW10	28	16	01	00
8	KDNW11	20	01	00	00
9	KDNW12	46	03	00	01
10	KDSW2	59	58	00	00
11	KDSW5	63	00	00	00
12	KDSW8	29	10	00	00
13	KDSW9	39	03	00	00
14	KDSW10	24	01	00	00
15	KDSW11	28	11	00	00
16	KDSW12	51	08	00	00
17	CW3	03	57	00	03
18	CW7	08	56	00	00
19	CW8	01	23	01	00
20	CW9	01	26	00	01
21	IW7	91	01	00	00
	<b>Totals</b>	<b>683</b>	<b>328</b>	<b>03</b>	<b>06</b>
	<b>Means</b>	<b>33</b>	<b>16</b>	<b>0.1</b>	<b>0.3</b>
	<b>Grand Mean</b>	<b>12</b>			

**DEVIATION FROM GRAND MEAN AND SUM OF SQUARES**

S/N	WARDS	$X_1 - \bar{X}$	$X_2 - \bar{X}$	$X_3 - \bar{X}$	$X_4 - \bar{X}$	$\bar{X}^2$	$\bar{X}^2$	$\bar{X}^2$	$\bar{X}^2$
1	KDNW1	28	04	-12	-11	784	016	144	121
2	KDNW5	07	07	-12	-12	049	049	144	144
3	KDNW6	36	-06	-11	-12	1296	036	121	144
4	KDNW7	-06	-11	-12	-12	036	121	144	144
5	KDNW8	11	-02	-12	-12	121	004	144	144
6	KDNW9	44	-10	-12	-12	1936	100	144	144
7	KDNW10	16	04	-11	-12	256	016	121	144
8	KDNW11	08	-11	-12	-12	064	121	144	144
9	KDNW12	34	-09	-12	-11	1156	081	144	121
10	KDSW2	47	46	-12	-12	2209	2116	144	144
11	KDSW5	51	-12	-12	-12	2601	144	144	144
12	KDSW8	17	-02	-12	-12	289	004	144	144
13	KDSW9	27	-09	-12	-12	729	081	144	144
14	KDSW10	12	-11	-12	-12	144	121	144	144
15	KDSW11	16	-01	-12	-12	256	001	144	144
16	KDSW12	39	-04	-12	-12	1521	016	144	144
17	CW3	-09	45	-12	-09	081	2025	144	081
18	CW7	-04	44	-12	-12	016	1936	144	144
19	CW8	-11	11	-12	-12	121	121	144	144
20	CW9	-11	14	-12	-11	121	196	144	121
21	IW7	79	-11	-12	-12	6241	121	144	144
	<b>TOTALS</b>	<b>431</b>	<b>76</b>	<b>-250</b>	<b>-246</b>	<b>20027</b>	<b>7426</b>	<b>2978</b>	<b>2892</b>

Total Sum of Squares =  $20027 + 7426 + 2978 + 2892 = 33323$

Total Sum of Squares Degree of Freedom =  $N - 1 = 84 - 1 = 83$

$$\begin{aligned}
\text{Between Sample Sum of Squares} &= \frac{1}{21} [(431)^2 + (76)^2 + (-250)^2 + (-246)^2] \\
&= \frac{1}{21} [185761 + 5776 + 62500 + 60516] \\
&= \frac{314553}{21} \\
&= 14979
\end{aligned}$$

$$\begin{aligned}
\text{Within Sample Sum of Squares} &= (\text{Total Sum of Squares}) - (\text{Between Sample Sum of Squares}) \\
&= 33323 - 14979 = 18344
\end{aligned}$$

$$\text{Degree of Freedom for Between Sample Sum of Squares} = 4-1 = 3$$

$$\text{Degree of Freedom for Within Sample Sum of Squares} = 83-3 = 80$$

#### ANALYSIS OF VARIANCE TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Variance Estimate
Between Samples	14979	3	4993
Within Samples	18344	80	229.30
<b>TOTAL</b>	<b>33323</b>	<b>83</b>	<b>.</b>

$$\text{Snedecor's Variance Ratio (F)} = \frac{\text{Greater Variance Estimate}}{\text{Lesser Variance Estimate}}$$

$$F = \frac{4993}{229.30}$$

$$F = 21.77$$

## Appendix 8

Dominant Religions in the four LGAs of the metropolis

RELIGION	KDSLGA	CLGA	ILGA	KDNLGA	Σ
Christianity	38	107	-	27	172
Islam	145	1	48	100	294
Total	183	108	48	127	466

In the table, the Grand Total is 466

To obtain Expected value for each cell =  $\frac{RT \times CT}{GT}$

GT

Where RT = Row total

CT = Column total

GT = Grand Total

The expected values for the observed values in the table are thereby calculated

$$\frac{172 \times 183}{466} = 67.55$$

$$466 = 67.55$$

$$\frac{294 \times 183}{466} = 115.46$$

$$466 = 115.46$$

$$\frac{172 \times 108}{466} = 39.86$$

$$466 = 39.86$$

$$\frac{294 \times 108}{466} = 68.14$$

$$466 = 68.14$$

$$\frac{172 \times 48}{466} = 17.72$$

$$466 = 17.72$$

$$\frac{294 \times 48}{466} = 30.28$$

$$466 = 30.28$$

$$\frac{172 \times 127}{466} = 46.87$$

$$466 = 46.87$$

$$\frac{294 \times 127}{466} = 80.12$$

$$466 = 80.12$$



Dominant Religions in the four LGAs of the metropolis

RELIGION	KDSLGA	CLGA	ILGA	KDNLGA	Σ
Christianity	38 (67.55)	107 (39.86)	- (17.72)	27 (46.87)	172
Islam	145 (115.46)	1 (68.14)	48 (30.28)	100 (80.12)	294
Total	183	108	48	127	466

The Expected values thus obtained have been entered in parenthesis against their appropriate observed values. Hence Chi-Square ( $\chi^2$ ) is calculated:

$$\chi^2 = \sum \sum \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

$$\chi^2 = \frac{(38 - 67.55)^2}{67.55} + \frac{(107 - 39.86)^2}{39.86} + \frac{(-17.72)^2}{17.72} + \frac{(27 - 46.87)^2}{46.87} +$$

$$\frac{(145 - 115.46)^2}{115.46} + \frac{(1 - 68.14)^2}{68.14} + \frac{(48 - 30.28)^2}{30.28} + \frac{(100 - 80.12)^2}{80.12}$$

$$\chi^2 = 12.926 + 113.090 + 17.720 + 8.423 + 7.557 + 66.54 + 10.369 + 4.932$$

$$\chi^2 = 241.171$$

For  $\chi^2$  two-sample test, the degree of freedom (df) is given by (n-1) (m-1) where n refers to the number of rows and m to number of columns.

$$\text{Therefore, } df = (2-1) (4-1) = 1 \times 3 = 3$$

With 3 degrees of freedom, the  $\chi^2$  distribution Table shows a value of 7.815 at .05 and a value of 11.345 at .01

Our calculated  $\chi^2$  of 241.171 is significant at 1 percent level and therefore conclude that residential choice is influenced by neighbourhood characteristics