

## An Evaluation of Factors Influencing Residential Segregation in Selected Areas of Bauchi Metropolis, Northern Nigeria

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### Abstract

Residential segregation, the spatial separation of population sub-groups within a given geographical area, is a phenomenon which is prevalent in both developed and developing countries like Nigeria. Earlier in Northern Nigeria this phenomenon was characterised by residential separation along ethnic lines (which led to the emergence of non-indigene settlements known as the "Sabon Gari") and in the present time residential segregation is also found along religious lines. This paper is aimed at examining the factors influencing residential segregation in selected areas of Bauchi metropolis in Northern Nigeria. The objectives of the research are to identify the pattern and the factors influencing residential segregation in the study area, and to evaluate the significance of the factors on residential segregation in the study area. 6 areas were sampled from study area and the research was conducted through questionnaire survey. The data collected was analysed using the Statistical Package for Social Sciences (SPSS v21). The research uncovered that the main factors influencing residential segregation in the study area are individual and aggregate socioeconomic characteristics, and individual preference/taste/choice of neighbourhood. And the research revealed that there is a significant relationship between these factors and residential segregation.

**Keywords:** Residential, Segregation, Sabon Gari, Bauchi, Hausa, Northern Nigeria

### 1. Introduction

Several authors in various disciplines have defined residential segregation. It was reported by Cundiff and Hudson (1999) to involve the spatial concentration of population groups. In a similar definition by Kemper (1998) residential segregation was referred as the spatial separation of population sub-groups within a given geographical area such as a large city. Such sub-groups can be formally defined in terms of age, occupation, income, place of birth, ethnic group or some other measures like race or religion. In line with this, Landrine and Corral (2009) referred to residential segregation as the geographical separation of whites from ethnic minorities in residential areas. However Acevedo-Garcia, Lochner, Osypuk and Subramanian (2003a) reported that available evidence indicates that segregation by race/ethnicity is stronger than segregation by income. Sanni and Akinyemi (2009) also stated that although the tendency of people to segregate based on income has been well documented in literature, it was found not to be very significant in Africa.

Williams and Collins (2001) referred to it as the physical separation of the races in residential contexts. Segregation was imposed by legislation, supported by major economic institutions, enshrined in the housing policies of the federal government, enforced by the judicial system, and legitimized by the ideology of white supremacy that was advocated by churches and other cultural institutions. The segregation of African Americans is distinctive. Although most immigrant groups have experienced some residential segregation in the United States, no immigrant group has ever lived under higher levels of segregation that currently exist in the African American population. In the early 20th century, immigrant enclaves have been never homogeneous to one immigrant group. In most immigrant ghettos, the ethnic immigrant group after which the enclave was named did not constitute a majority of the population of that area, and most members of European ethnic groups did not live in immigrant enclaves.

In Africa, the segregation of the natives from the Europeans came about through colonisation. Segregation was said to be suggested in 1897 (as a general health measure) when mosquitoes were discovered to cause malaria (Gale, 1980). However, it was not adopted until 1908 due to the outbreak of the plague in Accra (Ghana). A disease reported to

have claimed the lives of six million people in India between 1898 and 1907. The Colonial Office thus saw the introduction of the disease as a threat; hence, in 1910 it gave them more grounds to enforce segregation. Gale (1980) however opined that there were other important factors that made segregation popular in Northern Nigeria. The people in that region had no prior contact with the Europeans thus there were no merchants or professionals who could speak English. Social contact was so difficult thus leading to a more formal and distant type of relationship between the two groups.

The European administration led to the creation of new settlements in Northern Nigeria called the "Sabon Gari" (that is new town in Hausa Language). These settlements were established to house servants and labourers of the Europeans, and non-natives of the North. Edewor (2011) reported that prior to colonial rule there was a heterogeneous form of settlement (there were people of various tribes and nationality living together) in the Northern Nigeria (for example in Kano) where citizenship was based on residence and occupation. However, the British resolved to put an end to this residential pattern. Spatial, legal and psychological boundaries between social, ethnic, or racial categories were imposed to enforce a clear division between so-called races and ethnic groups to make these categories visible, in everyday life.

The *Sabon Gari* settlements are now found not only in the northern Nigerian cities but also in the southern Nigerian cities and their peculiarity derives from their unique demographic composition, social orientation and religious characteristics. The *Sabon Gari* settlements in the Hausa-Fulani dominated northern Nigerian cities are inhabited by southern Nigerian migrants while those in the Yoruba dominated south-western Nigeria are domiciled by the Hausa-Fulani settlers (Albert, 1993). Its abridged version, *Sabo*, became popular in south-western Nigeria and they are found in such Yoruba cities as Ibadan, Ijebu-Ode and Sagamu. In Igbo dominated eastern Nigeria, the Hausa-Fulani settle in the 'Abakpa Quarters'. These are, however, stranger settlements established by the strangers themselves through their continuous aggregation in given locations within the urban system. They are, however, patterned after the "*Sabon Gari*" settlements, which were established during the colonial era.

In recent times ethno-religious crisis has led to residential separation along ethnic and religious lines, Gambo & Omirin (2012) studied ethno-religious conflict and settlement patterns in selected cities in Northern Nigeria (Bauchi inclusive) where they report that the outbreaks of religious violence have a great impact on settlement patterns in the town thus leading to the creation of such settlements along religious and ethnic lines in order to safeguard lives. Similarly, Aliyu, Kasim, Martin, Diah & Ali (2012) on the other hand, studied the influence of intangible location factors (such as cultural identity, native inclination, safety, socioeconomic background, security, frequency of violence, religious inclination, ethnic background, indigeneship) on residential segregation in Jos, Plateau state. The study uncovered that residential segregation in Jos was greatly influenced by these factors, and this has led to change in the residential pattern of the town. The variations and trends in the sales and rental value of residential properties were said to be greatly affected by persistent residential segregation.

## 2. Objectives of the Research

Although few researchers such as those cited above have studied residential segregation and settlement patterns in some northern Nigerian states, little has been documented on Bauchi metropolis. It is based on these observations that this study aimed at:

- i. Identifying the patterns of residential segregation in the study area
- ii. Examining factors that influence residential segregation in the study area, and
- iii. Evaluating the significance of the identified factors on residential segregation in the study area

## 3. Concept of Residential Segregation

Residential segregation is a form of segregation that sorts population groups into various neighbourhood contexts and shapes the living environment and social space at the neighbourhood level. The residential neighbourhoods are often classified and segregated based on a variety of peculiarities. These include classification based on race/ethnicity, religion and economic/social status of individuals and groups within the population (Ifesanya & Nwokoro, nd). Kemper (1998) defined residential segregation as the spatial separation of population sub-groups within a given geographical area such as a large city. Such sub-groups can be formally defined in terms of age, occupation, income, birthplace, ethnic origin or other measures; or the sub-groups could be specified as social minorities distinguished from the dominant groups of power differentials. In another definition similar to that of Kemper, residential segregation is said to be the degree to which two or more groups live separately from one to another in different parts of the urban space (Aguilera & Ugalde, 2007). While Aliyu, Kasim, Martin, Diah & Ali (2012) opined that, it is the process where two or more communities that formerly lived together separate because of factors which could be either for religious or ethnic reasons. Cundiff &

Hudson (1999) defined residential segregation as the tendency for individuals with different racial backgrounds to inhabit different parts of metropolitan areas in greater concentrations.

#### 4. Factors Influencing Residential Segregation

People get separated along many lines and in many ways. There is segregation by sex, age, income, language, religion, colour, taste, comparative advantage and the accidents of historical location. Some segregation results from the practices of organizations; some are deliberately organised; and some results from the interplay of individual choices that discriminate, or some from specialized communication systems, like different languages. And some segregation is a corollary of other modes of segregation: residence is correlated with job location and transport (Schelling, 1971). According to Leeuw et al. (2007), segregation has a plurality of causes, such as private discrimination, historical and current government policies, income differentials, and preference.

Schelling (1971) was also of the view that two main processes were usually omitted in discussions on segregation, these being organised action and economically induced segregation. Those through organised action could be legal or illegal, coercive or merely exclusionary, subtle or flagrant, open or covert, kindly or malicious, moral or pragmatic. While the other process is largely but not entirely economic involves the separation of rich people from the poor, the skilled from the unskilled, the educated from the uneducated, the poorly dressed from the well dressed in where they work and live, and eat and play, in whom they know and whom they date and whom they go to school with. The organised segregation involves civil rights and the economically induced involves social equity - since making economic decisions on where to live often involves discrimination on colour basis. The three mechanisms are interwoven and it thus makes it not easy to draw the lines separating 'individually motivated' segregation, the more organised kind, and the economically induced kind. Moreover, these three are reported not to be the only mechanisms to segregation.

Residential segregation is said to originate either due to discrimination such as racial/ethnic prejudice in the US. It may also result from the choices or preferences, that is, members of various population groups may choose to live separately from other groups and sub-urbanisation (Acevedo-Garcia & Lochner, 2003b; Bayer, McMillan & Rueben, 2001). K'Akumu & Olima (2007) similarly reported that residential segregation may occur for two main reasons; social prejudice (state activated) or the malfunction of an economic system (market activated). And it may also arise due to religious intolerance. Aliyu et al. (2012), Gambo & Omirin (2012), Dung-Gwom & Rikko (2009), Uchendu (2010), Brimicombe (2007) and Poole & Doherty (1996) have also reported that mistrust and misconceptions amongst the different people and ethno-religious groups have often created conflict situations, which explode into religious violence. These violent clashes have led to residential segregation among religious groups. Edewor (2011) has reported that evidence from the literature shows that, three major factors: socioeconomic status, family status and ethnic status are the causes of residential segregation.

Anderson et al. (2003) in a paper titled *providing affordable family housing and reducing residential segregation by income* reported that increasing spatial (residential) segregation of households are caused by income, race, ethnicity, or social class. However, spatial segregation based on income has been shown not to be very significant in Africa (Sanni & Akinyemi, 2009). Also Fry & Taylor (2012) asserted that factors that may cause income residential segregation in the United States are historical settlement pattern; local housing policies, zoning laws, real estate practices and migration trends; and the characteristics of the local economy and workforce. The NPR Staff (2012) also holds the same view and in addition believe that housing discrimination and even a city's physical layout can lead to income residential segregation. Summarising the general causes of residential segregation from past research efforts of scholars; Petrescu-prahova (2008) classified the causes into three main categories: physical characteristics of the urban environment, individual and aggregate socioeconomic characteristics, and individual preferences for neighbourhood composition.

Residential segregation by either race or income has been reported by several researchers to develop as a result of neighbourhood sorting. Bayer et al. (2001) related that theory work in economics and other fields have provided knowledge about the forces underlying observed segregation patterns. They observed that Schelling's models of social interactions emphasized the role of preferences for neighbourhood racial composition, showing how even small differences in such preferences can give rise to high levels of racial segregation and produce important dynamic phenomena such as "neighbourhood tipping". That individual preference, through conscious or unconscious efforts, can usually aggregate to form universal or collective preferences (Schelling, 1971). While in Tiebout's theory, the emphasis was on preferences for local public goods, with households sorting across communities offering different public goods packages that are excludable based on location; residential stratification based on race or income was likely in these neighbourhoods to the extent that household preferences for local public goods vary with these characteristics.

In terms of preferences, households care about more than just the race of their neighbours or the level of local

public goods provision when making their location decisions; they make tradeoffs among the wide variety of housing and neighbourhood attributes associated with the available choices, and their demands for a given attribute vary with household characteristics. People may attach high value on the quality of the neighbourhood school, while some may place a premium on the accessibility of the home to their jobs. The distribution of households across neighbourhoods within a metropolitan area usually arises through a complex sorting process. While racial segregation may be attributable in part to households' preferences over the race of their neighbours, the correlation of race/ethnicity with other household characteristics makes it likely that many other factors contribute to the observed segregation patterns (Bayer et al., 2001). Some of the factors considered by families in selected neighbourhoods in Canada were affordability, accessibility to schools and workplaces, transportation, shopping, and proximity to worship places (Agrawal, 2009). A study conducted in the city of Ibadan, Nigeria by Sanni and Akinyemi (2009) revealed that families decided on the area to live through residential district preferences. In addition, the main factors found to affect their decision were environmental quality (such as good roads, water supply and so on), security of tenure, socio-cultural factors, closeness to work, the chance of getting a vacancy in the family compound, and cheap accommodation.

## 5. Patterns of Residential Segregation

Residential segregation has been reported by many scholars to exist in several patterns. It mostly takes the form of racial segregation which is most prevalent in the United States, ethnic (Gale, 1980; Edewor, 2011; Hartog & Zorlu, 2009; Albert, 1996, etc.), income (Anderson et al., 2003; Edwards, 1970), education, occupation and religion (Fong & Chan, 2008; Agrawal, 2008; and Shuttleworth & Lloyd, 2001).

Residential segregation of the colonial regimes was instituted and implemented through land policies which gave rise to a spatial dimension. The policies were encoded in legal decrees and enforced, for example, the Group Areas Act 36 of 1956 in South Africa. This marked segregation by the state. The spatial dimension of segregation went beyond the mere separation of residence. The containment policy that complimented the implementation of residential segregation resulted into gender segregation (where women and children were not allowed into the city) and occupational segregation-where entry of the unemployed 'idlers' were restricted. Apart from racial segregation, the colonial regime also attempted to separate Africans into ethnic enclaves; resulting in ethnic segregation (K'Akumu & Olima, 2007).

### 5.1 Racial and Ethnic Residential Segregation

Ethnic segregation refers to a spatial separation of ethnic groups from each other. In particular, it often manifests as a separation of minority populations from natives. As a concept, it is often used and understood in a negative way particularly in policy discourses (Wessel & Søholt, 2010). This form of residential segregation is reported to be more prevalent in countries like the United State of America and South Africa.

The segregation in South Africa was believed to date back to the Dutch rule of 1652, however the modern form was said to be consequent upon the gold and diamond exploration in the 19<sup>th</sup> century. Segregation transformed into apartheid in 1948 and continued until 1990. After the election of the Nationalist Party in 1948, laws were passed, in which individuals were characterized at birth as White, Asian, Coloured or African. Apartheid forbade interracial sexual relationships and marriages and social institutions, such as schools, restaurants, and libraries were firmly divided by racial boundaries. Following the election of 1948, Africans were allowed to work in white designated areas but citizenship into larger South Africa was a dream. Africans were forced to live far from the centre of the city and they were only allowed to enter the city for work during the day and retire to their homelands after the days work, and thus the city was "white by night" (McClinton & Zuberi, 2006).

Ethnic residential segregation has been a visible and salient aspect of urban life in the U.S., this is particularly due to the massive waves of immigration experienced during the 19<sup>th</sup> and early 20<sup>th</sup> century. Cities in the US have been reported to be home to a large African American population, which is, and has consistently been, residentially segregated from the native-born white population (Massey & Denton, 1993a; Petrescu-Prahova, 2008). No other ethnic group in America has had to endure the pervasiveness and intensity of residential racial segregation that blacks have experienced and continue to experience (Oh, 1995). According to Massey & Denton (1993a), the isolation and continued discrimination of black Americans by private and institutional practices have disenfranchised blacks from the urban housing market, which has led the creation of ghettos.

Oh (1995) and Fossett (2001) both reported Massey and Denton as stating that ethnic segregation in a city may result to "hyper segregation" where there is evidence of one or more of the following geographical traits:

- (1) Unevenness occurs when blacks are overrepresented in some parts of a metropolitan area and

- underrepresented in other parts;
- (2) Racial Isolation occurs when a racial group predominates in an area thus leading to no contact with members of other racial groups. It may also result from uneven distribution in the city's population;
  - (3) Clustering occurs when individual ethnic neighbourhoods are tightly clustered to form "one large contiguous enclave", for example, the formation of ghettos;
  - (4) Concentration occurs when members of ethnic group are concentrated within a very small geographic area; and
  - (5) Centralization occurs when members of an ethnic group live in neighbourhoods located within and around the urban core area, that is, disproportionately located within a central neighbourhood.

Petrescu-Prahova (2008) stated that studies (such as those of Massey & Denton, 1989; Waters, 1999) have shown that segregation exists within ethnic groups. Caribbean Hispanics had been found to display a degree of segregation from white Hispanics, highly segregated from black Hispanics and non-Hispanic blacks. Also similar characteristics were observed in West Indian immigrants, who strive to distinguish themselves from native blacks, who are the most stigmatised and discriminated segment of the U.S. population.

However, contrary to what is obtainable in areas like the US, no evidence was found on the existence of mono-ethnic neighbourhoods in The Netherlands. The higher concentration of non-Western immigrants in the large cities occurs in neighbourhoods with a high degree of diversity from several origins (Hartog & Zorlu, 2009).

## 5.2 Residential Segregation by Income

Income residential segregation has been found to differ greatly among income groups in ghettos. Edwards (1970) discovered that non-white families of different income level are segregated to a degree, which is moderate in an absolute sense but approximates that of similar income groups in Milwaukee's white community. Segregation is greatest between those families that differ most in level of income. Although the distinctions are less pronounced, segregation between family types (such as families' in high income groups, young couples without children, old couples with children, and the likes) also reflects this positive relationship between social distance and spatial distance. Those family types that differ most in life style were found to be the most segregated from each other. Although patterns of income segregation are not well documented as racial/ethnic segregation, it has been reported that between 1970 and 1990, residential segregation according to income level increased, especially among African Americans and Hispanics (Acevedo-Garcia et al., 2003a). Residential segregation by income is however not reported to be very significant in Africa (Sanni & Akinyemi, 2009).

Residential segregation by income often leads to the poor families having to live in poor neighbourhoods which often lack basic infrastructure as the families do not earn enough money to seek for better housing. Anderson et al. (2003) reported that housing affordability problems affect moderate-income as well as low-income families. In the United States, no state offers a minimum wage sufficient to allow a family with one full-time worker adequate earnings (at 30% of income) to afford the federal fair-market rent for a two-bedroom apartment.

Residential segregation by income has been reported by Fry & Taylor (2012) to have increased in the last three decades across the United States. The increases are related to the long-term rise in income-inequality, which has led to the shrinkage in the share of neighbourhoods across the US. These neighbourhoods which are predominantly middle-class or mixed-income decreased from 85% in 1980 to 76% in 2010, and a rise in the majority lower income (12% in 1980 to 18% in 2010) and majority upper income (from 3% in 1980 to 6% in 2010). They opined that despite the long-term rise in residential segregation by income, it remains less pervasive than residential segregation by race. Farley (1977) reported also that racial segregation is much more extensive than social class residential segregation. According to Schelling (1971) colour is correlated with income, and income with residence. He thus opines that even if colour was not considered in making residential choices and no discriminatory measures are exercised, blacks and whites will not be randomly distributed among residences. Income is believed to be the separating mechanism in this case.

## 5.3 Residential Segregation by Religion

A faith-based neighbourhood is essentially a social network of persons of the same faith, reinforced by the presence of a religious institution/place of worship. The faith-based social network is not geographically bound. The network and ties may be based on the association with the place of worship, but certainly not just because the congregants live side by side in a neighbourhood. (Agrawal, 2008). In many societies, people have formed settlements that are religious based or having been segregated from the dominant religious group.

Fong & Chan (2008) in a study conducted in Canada discovered that residential segregation was based on

religious groups. They found out that the Christian population were not segregated from one another (their indices for sub-groups were quite low) however Jews and Hindus were the most segregated religious groups. Jews were also found to be significantly segregated from Muslims, Hindus and Buddhists with an Index of Dissimilarity of over 0.65, while they showed moderate segregation with Christians (about 0.58). Similarly, Mehta (1969) reported that the Jews and Parsees, and the Christians, tend to be highly segregated and decentralized in Poona. And Agrawal (2008) disclosed that although religion played a role in the formation of faith-based ethnic neighbourhoods in Canada it was however weak.

Residential segregation by religion was also reported to exist in Northern Ireland where the Catholics and Protestants are highly segregated. The high levels of segregation in Belfast, Derry and mid Ulster were in part explained in terms of the history of the troubles in these places. All these areas were focuses for violence and had a history of territoriality which had been shaped by sectarianism. The local social history of housing may also have had an impact on the differing religious structure of the Northern Ireland Housing Executive (NIHE) estates in different district councils in Northern Ireland (Shuttleworth & Lloyd, 2001; Poole & Doherty, 1996).

Dung-Gwom & Rikko (2009) reported that the spate of ethno-religious violence is entrenching the divide in Nigerian cities along ethnic, cultural and religious lines. They maintained that owing to the incessant crisis in Jos, there has developed a divide in the city along religious lines. According to them the Christians have fled from the city centre to the peripheral areas, while the Muslims (Hausa-Fulani) are predominant in the inner city area. The separation of settlements among the two groups (Muslim and Christian) is solely for security or safety. Similar studies by Aliyu et al. (2012), Uchendu (2010) and Gambo & Omirin (2012) support these findings in Jos, Bauchi, Kano and Kaduna states.

The landscape of religion is found to be more highly segregated in contrast to the landscape of ethnicity (Brimicombe, 2007). While in Malaysia, the two crucial bases of cultural differential and thus of potential disintegration were reported to be language and religion (Ramli & Jamaludin, 2012).

#### *5.4 Residential Segregation by Occupation*

Blacks with professional jobs are highly segregated by residence from professional whites (Farley, 1977). Blacks who had the same skills and qualification as whites were reported to be discriminated against concerning wages and residence. Darden (2001) stated that the black workers in Britain, like those in the US, were given lower status jobs and paid lower average wages than their white counterparts. Because of the lower wages paid to the blacks, and the unemployment rates among them, it limits their housing preferences (Massey & Denton, 1993b). Wagmiller (2007) studied the spatial segregation of jobless black men in urban America and he discovered that jobless black men are more segregated from employed men than other men from other racial and ethnic groups are. They were less uniformly distributed throughout the metropolis and more isolated from employed men. They are concentrated in a small physical space and congregated closer to the centre of the city.

#### *5.5 Residential Segregation by Gender*

The spatial dimension of segregation went beyond the mere separation of residence in South Africa. The containment policy that complimented the implementation of residential segregation resulted into gender segregation where women and children were not allowed into the city (K'Akumu & Olima, 2007). This form of segregation is however not very common.

### **6. Methodology**

The cross-sectional survey design was adopted in this research, which is a means of studying a cross-section (sample) of the population at a single point in time (Ary, Jacobs & Racavieh, 2002). The data for the study was collected using self-administered questionnaires. This type of questionnaire reduces the cost of postage and travel, and interviewer bias (Gorard, 2001). The questionnaires were administered to households within the study area.

The study area, Bauchi, was stratified into three areas, that is, high density, medium density and low density for the purpose of this research. The high density areas are those areas occupied by the low income group, usually unplanned and unmaintained. The medium density areas are occupied by people from the various income groups, moderately maintained while the low density areas are occupied by the high income group. In the high density areas samples were taken from around the traditional walled city, for the medium density areas neighbourhoods within the urban periphery were sampled while for the low density areas samples were taken from within areas designated as government approved layout such as those within and around government reserved areas (GRA).

The data was analysed using the Statistical Package for Social Sciences (SPSS) version 21. The first research objective was analysed using descriptive statistics while the second objective was analysed using Multiple Regression Model. The P-value approach (short for probability) was utilised in answering the research question. On the basis of making scientific decision, 0.05 was used as the level of significance, when the p-value is less than the level of significance (0.05) it indicates that the factor is significant.

## 7. Discussion and Results of the Research Findings

### 7.1 Pattern of Residential Segregation in Bauchi Metropolis

The research sought to answer the first research question which is to determine the pattern of residential segregation in Bauchi metropolis. From the research conducted it revealed that income is the main pattern of residential segregation followed by religion and ethnicity as shown in the Table 1.1. The mean chosen for the analysis is 3 and anything above that shows how significant the factor is.

The pattern of residential segregation in the low density area revealed that income has a mean of 4.34. In the medium density area the mean for income as a pattern of residential segregation is 3.8633 while for the high density area is 3.696. Religion was also discovered to be a pattern of residential segregation in the study area, with the medium density area having a mean of 3.6967 while in the high density area 3.632. Another pattern that was revealed from the research was ethnicity with a mean of 3.3133 and 3.064 in the high density area. While age accounted for a mean of 3.02 in the medium and high density areas respectively.

**Table 1.1:** Descriptive Statistics for Pattern of Residential Segregation (Field Survey, 2014)

Descriptive Statistics				
Study area		N	Mean	Std. Deviation
Low density	Sex (male or female) determines who lives in this area	50	2.72	1.08872
	Age determines who lives in this area	50	2.82	1.18992
	Income determines who lives in this area	50	4.34	0.98167
	Ethnic group/tribe determines who live in this area	50	2.88	1.20611
	Religion determines who lives in this area	50	2.98	1.28556
	Valid N (list wise)	50		
Medium density	Sex (male or female) determines who lives in this area	300	2.7467	0.94098
	Age determines who lives in this area	300	3.02	1.08483
	Income determines who lives in this area	300	3.8633	1.05912
	Ethnic group/tribe determines who live in this area	300	3.3133	1.23839
	Religion determines who lives in this area	300	3.6967	1.29754
	Valid N (list wise)	300		
High density	Sex (male or female) determines who lives in this area	250	2.956	1.10587
	Age determines who lives in this area	250	3.02	1.11019
	Income determines who lives in this area	250	3.696	1.25294
	Ethnic group/tribe determines who live in this area	250	3.064	1.37238
	Religion determines who lives in this area	250	3.632	1.37409
	Valid N (list wise)	250		

### 7.2 Factors Influencing Residential Segregation in Bauchi Metropolis

#### 7.2.1 Physical Characteristics of the Urban Environment

The analysis of data in Table 1.2 below it indicates that none of the factors under the physical characteristics of the urban environment influence residential segregation in the medium and high density area of Bauchi metropolis owing to the fact that none of the factors outlined in the table has a mean of up to 3. However, these factors tend to have a strong influence on residential segregation in the low density area with accessibility having a mean of 4.4; the condition of roads has a mean of 4.36, while the physical layout (good roads, drainage etc) has a mean of 4.24. Thus the analysis here reveals that people choose to live in the low density areas because they have better planning as opposed to what obtains in the medium and high density areas of the study area where these stated factors are either poor or lacking. The

decision of people to live in the area because of its physical characteristics is attributed to the fact that people who reside in the low density areas are usually high income earners who can afford houses in such well planned areas.

**Table 1.2:** Physical Characteristics of the Urban Environment (Field Survey, 2014)

Descriptive Statistics				
Study area		N	Mean	Std. Deviation
Low density	The physical layout (good roads, drainage etc) of the area made you to live here	50	4.24	0.82214
	You live here because the area is highly accessible	50	4.4	0.75593
	You live in this neighbourhood because the condition of the roads are good	50	4.36	0.77618
	You live in this neighbourhood because it has good drainage	50	4.18	0.96235
	Valid N (list wise)	50		
Medium density	The physical layout (good roads, drainage etc) of the area made you to live here	300	2.0633	0.89927
	You live here because the area is highly accessible	300	2.4333	1.15904
	You live in this neighbourhood because the condition of the roads are good	300	1.9267	0.92238
	You live in this neighbourhood because it has good drainage	300	1.7167	0.82785
	Valid N (list wise)	300		
High density	The physical layout (good roads, drainage etc) of the area made you to live here	250	2.384	0.92083
	You live here because the area is highly accessible	250	2.56	0.84929
	You live in this neighbourhood because the condition of the roads are good	250	2.2	0.75517
	You live in this neighbourhood because it has good drainage	249	2.1647	0.85253
	Valid N (list wise)	249		

### 7.2.2 Individual and Aggregate Socioeconomic Characteristics

In Table 1.3 below it shows that some factors under individual and aggregate socioeconomic characteristics influence residential segregation in Bauchi metropolis. It reveals clearly that income is the most singular factor that highly influences residential segregation in all the three density areas of the study area accounting for a mean greater than 3.

In the low density area income accounts for a mean of 4.1, in the medium density area 4.0367, while in the high density area 3.8537. Religion is shown to be next in terms of influencing residential segregation in the study area with a mean of 3.6767 in the medium density area and 3.664 in the high density area; it is however not indicated in the low density area. Ethnicity has been revealed to have an influence on residential segregation in the study area having a mean of 3.21 in the medium density area and 3.012 in the high density area.

The research reveals also that family status determines people's choice of where to live in the low density area with a mean of 3.42, and it accounts for 3.1133 in the medium density area. Age has been identified as a factor influencing residential segregation in the study accounting for a mean of 3.0433 in the medium density area and a mean of 3.249 in the high density area. Sex as a factor influencing residential segregation, as was only reported in the high density area with a mean of 3.048.

**Table 1.3:** Individual and Aggregate Socioeconomic Characteristics (Field Survey, 2014)

Descriptive Statistics				
Study area		N	Mean	Std. Deviation
Low density	Your sex (male or female) determines where you live	50	2.4	0.69985
	Your age determines where you live	50	2.48	1.01499
	Your religion determines where you live	50	2.68	1.3468
	Your income determines where you live	50	4.1	1.0351
	Your ethnicity determines where you live	50	2.64	1.1205
	Your family status determines where you live	50	3.42	1.08965
	Your language determines where you live	50	2.4	0.85714
	Your ancestor determines where you live	50	2.46	1.03431
	Valid N (list wise)	50		
Medium density	Your sex (male or female) determines where you live	300	2.72	0.91527
	Your age determines where you live	300	3.0433	1.07641
	Your religion determines where you live	300	3.6767	1.21534
	Your income determines where you live	300	4.0367	1.04513



	Your ethnicity determines where you live	300	3.21	1.16207
	Your family status determines where you live	300	3.1133	1.22971
	Your language determines where you live	300	2.9567	1.03845
	Your ancestor determines where you live	300	1.9367	1.27989
	Valid N (list wise)	300		
High density	Your sex (male or female) determines where you live	250	3.048	1.17781
	Your age determines where you live	249	3.249	1.19232
	Your religion determines where you live	250	3.664	1.27657
	Your income determines where you live	246	3.8537	1.21677
	Your ethnicity determines where you live	250	3.012	1.30024
	Your family status determines where you live	250	2.632	1.14447
	Your language determines where you live	250	2.464	1.03779
	Your ancestor determines where you live	250	1.688	0.82546
	Valid N (list wise)	246		

### 7.2.3 Individual Preferences/Taste/Choice of Neighbourhood

The analysis of factors under individual preferences/taste/choice of neighbourhood shows that in the low density area all the factors identified in Table 1.4 influence residential segregation except the choice of living in an area where various ethnic groups reside. One factor which the respondents in the low density areas strongly agreed had an influence on choice of neighbourhood and thus influencing residential segregation is security which accounted for a mean of 4.12, but this factor was not reported in the medium and high density areas of the study area.

From the table it reveals that response for the quality and accessibility of schools around a neighbourhood as a factor influencing residential segregation accounts for a mean of 3.94 in the low density area and 3.204 in the high density area, this factor was found to have no significance in the medium density area. Another factor that was reported to have a high influence in determining residential segregation in the study area is the ease of transportation. This factor accounts for a mean of 3.8 in the low density area, 3.5242 in the high density area and 3.1967 in the medium density area.

Accessibility and nearness to place of work has a mean of 3.5 in the low density area, 3.5502 in the medium and 3.11 in the high density areas respectively. Affordable housing accounts for a mean of 3.8033 in the medium density area, 3.444 in the high density area and 3.2 in the low density area.

**Table 1.4:** Individual Preferences/Taste/Choice of Neighbourhood (Field Survey, 2014)

Descriptive Statistics				
Study area		N	Mean	Std. Deviation
Low density	You live in this neighbourhood because of the various ethnic groups that live here	50	2.86	0.98995
	You live in this neighbourhood because of the quality and accessibility of schools around it	50	3.94	0.91272
	You live in this neighbourhood because it is accessible/near to your place of work	50	3.5	1.07381
	You live in this neighbourhood because the houses are affordable	50	3.2	1.12486
	You live in this neighbourhood because of the ease of transportation	50	3.8	0.90351
	You live in this neighbourhood because of its closeness to markets and shops	50	3.08	1.10361
	You live in this neighbourhood because of its closeness to place of my worship	50	3.02	0.97917
	You live in this neighbourhood because it has adequate electricity supply	50	3.12	1.20611
	You live in this neighbourhood because of the availability of health care facility	50	3.44	1.26427
	You live in this neighbourhood because it has adequate security	50	4.12	0.98229
	Valid N (list wise)	50		
Medium density	You live in this neighbourhood because of the various ethnic groups that live here	300	2.9567	1.07641
	You live in this neighbourhood because of the quality and accessibility of schools around it	300	2.6767	1.16188
	You live in this neighbourhood because it is accessible/near to your place of work	300	3.11	1.22866
	You live in this neighbourhood because the houses are affordable	300	3.8033	0.76153
	You live in this neighbourhood because of the ease of transportation	300	3.1967	0.99059
	You live in this neighbourhood because of its closeness to markets and shops	300	2.9567	1.13391

	You live in this neighbourhood because of its closeness to place of my worship	300	3.2233	1.11846
	You live in this neighbourhood because it has adequate electricity supply	300	2.4433	1.10037
	You live in this neighbourhood because of the availability of health care facility	300	1.8133	0.89508
	You live in this neighbourhood because it has adequate security	300	1.7067	0.91474
	Valid N (list wise)	300		
High density	You live in this neighbourhood because of the various ethnic groups that live here	250	3.06	1.22573
	You live in this neighbourhood because of the quality and accessibility of schools around it	250	3.204	1.13115
	You live in this neighbourhood because it is accessible/near to your place of work	249	3.5502	1.14937
	You live in this neighbourhood because the houses are affordable	250	3.444	0.93077
	You live in this neighbourhood because of the ease of transportation	248	3.5242	1.03747
	You live in this neighbourhood because of its closeness to markets and shops	250	3.304	1.33669
	You live in this neighbourhood because of its closeness to place of my worship	250	3.36	1.27629
	You live in this neighbourhood because it has adequate electricity supply	250	2.408	0.84641
	You live in this neighbourhood because of the availability of health care facility	250	1.948	0.97833
	You live in this neighbourhood because it has adequate security	250	1.98	1.2846
	Valid N (list wise)	247		

#### 7.2.4 Political/Institutional Factors

The analysis revealed that political and institutional factors do not influence residential segregation in the medium and high density areas as none of the factors has a mean of 3 as shown in Table 1.5. However, in the low density area findings reveal that local housing policies operating in the state have been indicated as a factor influencing residential segregation with a mean of 3.22.

**Table 1.5:** Political/Institutional Factors (Field Survey, 2014)

Descriptive Statistics				
Study area		N	Mean	Std. Deviation
Low density	You live in this neighbourhood because of the local housing policies operating in the state	50	3.22	0.97499
	You live in this neighbourhood because of the zoning laws operating in the state	50	3.12	0.98229
	You live in this neighbourhood because your estate agent advised/directed you to this area	50	2.76	1.09842
	Valid N (list wise)	50		
Medium density	You live in this neighbourhood because of the local housing policies operating in the state	300	2.15	0.88134
	You live in this neighbourhood because of the zoning laws operating in the state	300	1.93	0.75742
	You live in this neighbourhood because your estate agent advised/directed you to this area	300	1.82	0.78506
	Valid N (list wise)	300		
High density	You live in this neighbourhood because of the local housing policies operating in the state	248	2.1613	0.82851
	You live in this neighbourhood because of the zoning laws operating in the state	250	2.096	0.80084
	You live in this neighbourhood because your estate agent advised/directed you to this area	250	2.132	0.95405
	Valid N (list wise)	248		

From the foregoing analysis it shows clearly that only individual and aggregate socioeconomic characteristics and individual preference/taste/choice of neighbourhood are the factors that influence residential segregation in the medium and high density areas of Bauchi metropolis. While in the low density area, all the stated factors above, that is, physical characteristics of the urban environment; individual and aggregate socioeconomic characteristics; individual preference/taste/choice of neighbourhood and political/institutional factors influence residential segregation in the study area.

#### 7.3 Significance of the Factors of Residential Segregation in Bauchi Metropolis

The analysis of data in this section was used to answer the third research question, which seeks to determine how significant are the identified factors in the second research question (individual and aggregate socioeconomic characteristics, individual preference/taste/choice of neighbourhood, political/institutional factors and physical characteristics of the urban environment) on residential segregation in the study. The data here was analysed using the Multiple Regression Model.

**Table 1.6:** Multiple Regression for relationship between the factors of residential segregation and residential segregation pattern in Bauchi metropolis (Field Survey, 2014)

Model Summary					
Density	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Low density	1	.726 <sup>a</sup>	0.528	0.486	3.09635
Medium density	1	.730 <sup>b</sup>	0.533	0.528	2.82264
High density	1	.800 <sup>c</sup>	0.64	0.63	2.44261
a. Predictors: (Constant), Political and Institutional(X1), Physical characteristics(X3), Socioeconomic characteristics(X2), Individual preference(X4)					
b. Predictors: (Constant), Political and Institutional, Socioeconomic characteristics, Physical characteristics, Individual preference					
c. Predictors: (Constant), Political and Institutional, Socioeconomic characteristics, Individual preference, Physical characteristics					

The output of the Multiple Regression Model in Table 1.6 above clearly indicates that there is a significant relationship between the residential segregation pattern and the identified factors responsible for it. The above factors, X1, X2, X3 and X4, as the independent variables when combined together have a significant impact on residential segregation (Y) which is the dependent variable. The extent or strength of the relationship between these factors of residential segregation and residential segregation patterns was seen to be higher in the high density area than in the other areas. The correlation coefficients (r) for density areas that indicated the extent of relationship are as follows:

- r=0.726 for Low density with *p-value* of about 0.0001
- r=0.730 for Medium density with *p-value* of about 0.0001
- r=0.800 for High density with *p-value* of about 0.0001

**Table 1.7:** ANOVA for Relationship between the Factors of Residential Segregation and Residential Segregation Pattern in Bauchi Metropolis (Field Survey, 2014)

ANOVA <sup>a</sup>							
Density	Model	Sum of Squares	df	Mean Square	F	Sig.	
Low density	1	Regression	482.187	4	120.547	12.6	.000 <sup>b</sup>
		Residual	431.433	45	9.587		
		Total	913.62	49			
Medium density	1	Regression	3585.289	4	896.322	113	.000 <sup>c</sup>
		Residual	3139.122	394	7.967		
		Total	6724.411	398			
High density	1	Regression	1535.65	4	383.913	64.3	.000 <sup>d</sup>
		Residual	865.123	145	5.966		
		Total	2400.773	149			
a. Dependent Variable: Residential Segregation (Y)							
b. Predictors: (Constant), Political and Institutional, Physical characteristics, Socioeconomic characteristics, Individual preference							
c. Predictors: (Constant), Political and Institutional, Socioeconomic characteristics, Physical characteristics, Individual preference							
d. Predictors: (Constant), Political and Institutional, Socioeconomic characteristics, Individual preference, Physical characteristics							

The result above revealed that there is a highly significant relationship between the factors and residential segregation in Bauchi metropolis. The evidence is so sufficient because the p-value of 0.0001 is highly less than the level of significance 0.05 this is shown in Table 1.7.

**Table 1.8:** correlation coefficients relationship between the factors of residential segregation and residential segregation pattern in Bauchi metropolis (Field Survey, 2014)

Coefficients <sup>a</sup>							
Density	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
		B	Std. Error	Beta			
Low density	1	(Constant)	-3.68	3.694		-1	0.324
		Physical characteristics	0.132	0.165	0.089	0.8	0.427
		Socioeconomic characteristics	0.639	0.116	0.655	5.5	0
		Individual preference	0.025	0.096	0.036	0.26	0.796

		Political and Institutional	0.204	0.218	0.116	0.94	0.353
		(Constant)	3.848	0.799		4.82	0
Medium density	1	Physical characteristics	-0.103	0.055	-0.081	-1.85	0.065
		Socioeconomic characteristics	0.438	0.027	0.639	16.5	0
		Individual preference	0.116	0.027	0.192	4.29	0
		Political and Institutional	-0.035	0.076	-0.018	-0.46	0.643
		(Constant)	2.631	1.426		1.85	0.067
High density	1	Physical characteristics	0.017	0.109	0.01	0.16	0.877
		Socioeconomic characteristics	0.62	0.043	0.809	14.6	0
		Individual preference	-0.023	0.066	-0.021	-0.35	0.731
		Political and Institutional	-0.104	0.126	-0.049	-0.83	0.409
		(Constant)	2.631	1.426		1.85	0.067
a. Dependent Variable: Residential Segregation (Y)							

Furthermore, it can be seen in Table 1.8 that socioeconomic characteristics and individual preference/taste contribute more to residential segregation than political/institutional and physical characteristics. In the low density and high density area the socioeconomic characteristics has a p-value of 0.0001, and in the medium density area socioeconomic characteristics and individual preference/taste each have a p-value of 0.0001 which is less than the level of significance 0.05.

## 8. Conclusion and Recommendations

Several findings have been made in this research. The research revealed that the patterns of residential segregation in the study area are based mainly on income, religion and ethnicity; and the factors influencing residential segregation in Bauchi metropolis have been identified as mainly individual and aggregate socioeconomic characteristics, and individual preference/taste/choice of neighbourhood. The research has established that there is a significant relationship between residential segregation the factors influencing residential segregation in Bauchi metropolis.

There is a need for the government to provide adequate infrastructure in the medium and high density areas which have been observed to be not very well planned or not planned at all as compared to the low density area of the study area. There should also be proper implementation and enforcement of housing policies and zoning laws in the study area as it was observed that such policies are not usually adhered to.

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