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THE USE OF MULTINOMIAL LOGISTIC REGRESSION MODEL TO BUILD HOUSING CHOICE IN ABUJA

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ABSTRACT: *The study attempted the building of housing choice of residence of Abuja, Nigeria. Six (representing 10%) of the sixty-two political wards in Abuja were randomly selected without replacement. The selected wards were Gwarinpa, Kubwa, Gwagwalada Central, Kwali Central, Kuje Central and Abaji Central. In all, 893 buildings were selected, and questionnaires were administered on one household head in each building. Socioeconomic characteristics of the households revealed that 82.4% of the residents were between the ages of 31 and 60 years. Also, 66% of the residents were males, while 34% were females. In addition, 37.7% of the residents were educated to the university level. Analysis of the factors of housing choice using Multinomial logistic regression revealed that single, divorced as well as widowed people were more likely to make a housing choice in Kwali, Kuje or Abaji Ward instead of Gwarinpa than their married counterparts (OR = 5.27, p<0.05, 95% CI = 0.283-1.101). The study concluded that the general pattern of housing choice was based on housing location, quality and neighbourhood attributes as well as the socio-economic status of the choice maker.*

KEY WORDS: Multinomial Logistics Model, Housing Choice, Concept of Housing, Social stratification, Social Status.

INTRODUCTION

Housing as a unit of environment has profound influence on the health, efficiency, social behaviour and satisfaction of a nation. It reflects the cultural, social and economic values of a society. It is also recognized as the best physical and historical evidence of civilization (Pickvance, 1973). Housing could also be described as the primary built environment for a human being where a person can express himself/herself, develop his/her identity and where human activities and social relationships are structured.

Other scholars such as Onibokun (1985) and Olayiwola (2003), importunated housing as a main source of protection, comfort and security for households. To them therefore housing is a key determinant of a

person's standard of living and of his place in the society. To this end, housing could be construed to be next to food and clothing in rank order. Choosing a home is among the most important decisions a person can make in life. Thus, housing choice is defined as a response to an extremely complex set of economic, social and psychological impulses where some households may choose a house because they can afford it. Housing choice is also defined as state of mind about what kind of housing is desired and feasible at the current moment given the current constraint. It is unstable and changes for a specific household whenever significant changes occur (Morris et al., 1978; Roske, 1983 and Shi, 2001).

One of the most important constraints that determine a person's choice of a home is the current social status of the household. Social Status is described as the relative rank that an individual holds with attendant rights, duties and lifestyle in a society, based on honour or prestige. Earlier research by Mills (1970) had also revealed that the right to land and housing is strongly determined by households social status, which could be changed in the stratification system through a process of social mobility. This upward or downward movement in social status determines the basic needs and restrictions in terms of housing attributes preferred by a household. These attributes of dwellings such as quality and size, neighborhood, location, reinforcement, fittings and finishes, windows, doors, roof styles and aesthetics constitute strong preference for a chosen home.

This motivated most urban dweller's belief that their chosen homes must have profound influence on their health, efficiency, social behaviour, satisfaction and general welfare. However, it is not unlikely that due to problems of housing deficit, some residents of Abuja may be living in housing units that are counter productive and detrimental to their well- being. It is also not impossible that some city dwellers may be forced to move out to the peripheral area of the city to live due to high rent, scarcity of affordable housing units and the likes.

For instance, casual observation shows that, during week days between the hours of 8.30 am and 11.30 am, residents of Abuja along Karu- Nyanyan axis as well as Kubwa axis, always find it difficult to get to their various places of work due to heavy traffic grid lock that normally last for hours. This similar experience is always repeated between the hours of 4.00pm and 6.30pm in the evening while going back home. This had made the unofficial resumption time in Abuja to be 10am instead of the official 8.00am. Also, many residents had suffered security risk through bomb blasts that were targeted at crowded spots.

Nevertheless, empty, unoccupied, aesthetical and well constructed completed unit houses as well as estates abounds at good locations in Abuja. Therefore, this research investigates into the determinants of housing choice of Abuja residents. This is with a view to providing information about people's housing choice pattern that could inform policy response in meeting housing demand of Abuja residents.

LITERATURE REVIEW

Evidence abounds that urban dwellers in the World and Africa in general and Nigeria in particular are faced with numerous housing problems. Some of these housing problems border on housing cost, availability, quality, choice and various other housing attributes. Researches on housing choice in Sidney inferred that permanent and trajectory income, demographic characteristics, relative cost of renting versus owning, life time earning prospects, family background and unemployment rate, were the major housing constraints in Sidney (Bourassa (1995), Tsalvo, et al.,(1999), Bourassa, et al.,2006). Common tenure types included fully owned, mortgage, renting (renting social housing, renting private) and other tenure types. Location and preference for high density dwellings was the main housing preferences for young adults. The research further stated that in the year 2011, 95% of the houses in the city of Sidney were medium or high density development while five percent were low density development. As such the study failed to address housing choice with respect to people's cultural and religious background.

Buckley et al., (2007), and Tandoh et al., (2013). researched into housing choice behavior of residents in Accra, Ghana. The study revealed that residents lived in highly dense areas; average room occupancy was high with more than 45% of families in Accra city living in a single room. The report identified location, household size, cultural obligations, family size and regulatory tax as the main housing choice determinants. The two most common tenure practices were renters and owning. Similarly, Shi (2001), worked on the housing choice and preferences of residents in the city of Stellenbosch, one of the active and expensive housing markets in South Africa. The study modeled the housing choice of the city using Hedonic Price model. The research discovered that availability of good kitchen was the most valued housing quality in the city. These studies did not inquired into Information on the residents' social status and stratification that could inform a holistic approach to the residents' pattern of housing choice behaviors. As a result, studies are required to determine the extent to which these factors influence resident's choice of houses.

Studies on housing choice in Nigeria include that conducted by Arimah (1997) into the housing tenure choice in Ibadan. The research recognized income, the need to acquire a house, number of children in the house, gender of the head of household, length of stay in the city, access to land on the basis of ethnic qualification as being major check on housing choices of residents. Similarly, Olatubara (1997) researched into an alternative approach to the Urban Residential Location decision in Nigeria using the Nesting Idea. The research acknowledged the influence that residential location decision has an effective and efficient use of urban facilities and its implications on the household's financial budget. The study identified distribution of the household activity nodes as a main factor of residential location decisions. This study observed that available residential units were priced outside the reach of many urban dwellers to the extent that the residents were compelled to choose from almost a no-choice situation. The study concluded by proposing a household central approach in which the household adjusts its residential location to the distribution of the activity nodes it patronizes. Thus, the research did not include in its scope housing preferences such as the quality and types of the available housing, the prevailing tenure types, as well as the influence of socio-economic status of the residents on their residential location decision making, the gap which this research intends to fill.

In the same vein, Lateefat (2008) researched into residential housing choice in the core areas of Ibadan. The study acknowledge that until a household's achieves its dream of the preferred residential area, the urge to change residence always increases. The study also noted that many houses in the study area were in deplorable conditions, therefore, the study tried to find out why people chose to live in the area. Findings of the study revealed that many of the residents were not willing to vacate the study area despite its characteristics slum, congestion, filthiness and poor environmental condition. Consequently, the study was compelled to examine residents' choice behavior mainly from the point of view of poverty and affordability. However, this research is focused on residents who are able to make housing decision in a supposed African Model city, under healthy environment, good quality houses and availability of various housing tenure types.

Similarly, Okesoto et al., (2014) researched into the residential location preference of Lagos Central Business District (CBD) working population. Data for the study were collected from 128 working population in the Lagos CBD. The data obtained included respondents' socio-economic and demographic characteristics, residents' location consideration and preference, costing and housing characteristics. The research revealed that housing affordability was a main determinant of the

residents housing choice. The paper therefore recommended that CBD in Lagos as a whole should be decentralized since majority of the working class preferred living closer to where they work.

Study area

Abuja is located between latitudes $8^{0}25^{1}$and $9^{0}25^{1}$ north of the equator and longitudes $6^{0}45^{1}$ and $7^{0}45^{1}$ east of Greenwich. The detail boundaries of Abuja was defined in the Federal Capital Territory Decree No 6. as follows: (i) Starting from the village called Izom on 7^{0}E longitude and $9^{0}15^{1}$ latitude, project a straight line westwards to a point just north of Lehu on the Kemai River (ii) then project a line along $6^{0}47½$ E southwards passing close to the villages called Semasua, Zui and Bassa down to a place a little west of Ebagia in Kwara State, (iii) project a line along parallel $8^{0}27$ $½^{1}$N latitude to Ahinza village $7^{0}6^{1}$E (iv) project a straight line to Bugu village on $8^{0}30^{1}$N latitude and $7^{0}20^{1}$E longitude (v) draw a line northwards joining the villages of Odu, Karshi and Karu. (vi) from Karu the line should proceed along the boundary between the North-West and Benue-Plateau States as far as Karu (vii) the line should proceed along the boundary between North-Central and North-Western States up to a point just north of Bwari village (viii) the line goes straight to Zuba village and then straight to Izom.

The Abuja Master Plan was designed by the International Planning Association (IPA), United State of America (USA). The City was divided into two Sectors of Residential Districts to accommodate population of between 100,000 and 250,000 people. The Federal Capital City was conceived to have a four phased development plan and to accommodate a total population of 1.60 million people by the year 2000, (Planning and Research, 2001).The Master Plan further indicated that, less than half of Abuja land mass was budgeted for residential land-use. This projection was grossly inadequate for an evolving national capital of a highly populated country like Nigeria. This was the beginning of the housing problems in Abuja. The development of Abuja was to commence from Phase I of the Federal Capital City which consists of the central area and 4 residential districts.

The advent of democratic rule in Nigeria in 1999 brought with it the introduction of the Public- Private Partnership (PPP) Approach in Abuja. The approach was aimed at "resolving "the needs and demand gap in the shelter provision. Hence, government adopted a more market oriented approach to housing delivery and infrastructure development in Nigeria; stressing its role as that of enabler and regulator, rather than a provider. This became a boost to the organized private sector (OPS) to take position in the provision of housing in Nigeria and Abuja in particular. Thus, the major noticeable PPP took-off in Abuja in the year 2000; with emphasis on the provision of infrastructure and housing in form of Mass

Housing Scheme. (Ukoje et al., 2014 and Federal Capital Territory Administration (FCTA, 2008). Based on the policy the then Ministry of the Federal Capital Territory (MFCT) launched its guidelines for Mass Housing Development (MHD). The proposal included the allocation of large parcels of land to private sector real estate developers at low prices. The developers in-turn are expected to construct affordable housing and tertiary infrastructure so as to link communities to the government provided primary infrastructure. Altogether, 360 private developers were allocated 12,691 hectares of land within 22 Districts of Abuja. The goal of the scheme was enunciated as: (i) to enhance private sector participation in housing delivery; (ii) to bridge the gap between supply and demand of the housing stock within Abuja; and (iii) to take-off the burden of providing infrastructure and housing for the ever -increasing urban population (FCTA,2008). Thus, housing land were allocated to developers in various districts of Abuja namely: Dakwo (South), Duboyi (South), Dutse (South), Gaduwa (South), Galadimawa (South), Saraji (South). Others includes Lokogoma (South),Wumba (South), Bunkori (North) , Gwarinpa (ii) Iddo-Gwari (North), Idu-Sabo (North), Kado (North), Kafe (North), Karsana East (North), Karsana North, Karsana South, Karsana West, Kado (North), Mbora (North), Sabon-Gida (North) and Wupa (North).

Research methods

The Sample population for the study was made up of households in the identified 62 political wards in Abuja. First, the identified 62 political wards were stratified into their various districts. In the second stage, 10% samples of the wards were selected by simple random sampling method to give a total of 6 wards. The selected wards includes Gwarinpa, Kubwa, Gwagwalada Central, Kwali Central, Kuje Central and Abaji Central. Available records also showed that there were 21487, 9184, 5548, 2233, 4592 and 1695 houses in Gwarinpa, Kubwa, Gwagwalada Central, Kwali Centra\l Kuje Central and Abaji Central wards respectively. In the third stage, 2% sample (as postulated by Scheaffer et al.,1995 and Sivo et al., 2006) of the houses in each of the identified 6 Wards were selected by systematic random sampling technique to give 430,184,107,45,93 and 34 houses in Gwarinpa, Kubwa, Gwagwalada Central, Kwali Central, Kuje Central, and Abaji Central wards respectively. On the whole a total of 893 buildings were selected and questionnaires were administered on the household head of the selected buildings. However, where the household head were not available, the next available male or female members of the household were sampled. Furthermore, where there were more than one household in a building, only one household were selected.

Analysis and results

The socio- economic characteristics of respondents that were discussed includes issues such as age, gender, marital status, education status, population, ethnicity, household size, household types, health of the household, housing tenure, housing preference of the household head and social status/stratification.

Age distribution represents an important component of socio-economic characteristics of respondents. In this study, respondents' ages were categorized into three age brackets. These are 18 to 30years, 31 to 60 years and above 60 years as postulated by Green (1998) and http://en.wikipedia.org/wiki/tenagepregnancy. These groups were regarded as the youth, young adult and adult age respectively. These are as shown in Table1.

As can be seen from the above, the youth constituted 14.2% of the respondents. It was also established that most of the respondents were in the age bracket of 31-60 years. This age group represented 82.4% of the respondents. In essence, most of the residents in Abuja are in their productive years. The adult constituted the lowest proportion (3.4%) of the residents. This is probably due to the high cost of living and the hectic nature of city life.

Further analysis revealed that the minimum age of respondents was 18 years while the maximum was 90 years. The mean age and standard deviation were 41.6years and 9.6 years respectively. The analysis of variance (ANOVA) confirmed that there were significant differences in the age distribution of the residents ($F = 4.29$) $p = 0.0007$

It could be inferred from the above that the variation in age distribution of residents was due to the fact that Abuja exhibits some level of social stratification where the inhabitants reside where they belong.

Findings on the educational status of residents indicated that 6.0% of the respondents had no formal education; while 5.5% had at least primary education. The percentage of those that were educated to secondary and Grade II levels were 5.8% and 7.9% respectively. This is as indicated in table 4.5. A critical observation of the table further shows that 45.5% of Gwarinpa residents were university degree holders. Similarly, 40.1% of Gwagwalada residents also had university education. The study further revealed that 37.7% of Abuja residents were educated to the university level.

On the overall, 6.0% of the Abuja population had no formal education, 5.5% had primary school leaving certificate while 5.8% had secondary school certificate. The NCE, OND/HND and university degree holders represented 19.7%, 17.3% and 37.7% respectively.

The Chi-square test computed revealed that there existed significant variation in educational status of residents in the different wards surveyed. The results of chi-square value of 184.05 significant at 0.05 confirmed this. Further confirmation was also the fact that Abuja residents, with high educational status were found to be living places such as in Gwarinpa, Gwagwalada and Kubwa respectively. This could be attributed to the fact that Gwarinpa had the highest concentration of good quality houses. Gwagwalada is the location of the University of Abuja while Kubwa was the only ward in addition to Abuja city centre that has pipe-borne water.

A good proportion of residents of Abuja are public sector workers (9.4%) or civil servants (3.2%). In fact Abuja could be regarded as a civil servant town. About 17.1% and 14.4% of the residents of Abuja work with the organized private sector or are artisans as the case may be. In disaggregated terms, Civil servants could be seen in large number in Kwali (45.6%), Kuje Central (51.0%) and Kubwa (41.6%). Furthermore, most of the organized private sector workers are found in Gwarinpa (35.1%) due to availability of good quality houses, while 52.3% of artisans live in Abaji Central due to its relatively lower cost of living.

In addition, of the 288 respondents in Gwarinpa, 15.3% were civil servants. They were workers of Federal/State liason offices, Parastatals, Local Government Authority. Furthermore, 9.4% represented those working in public service namely Armed forces, the Nigeria Police Force, Air Force and Paramilitary Officers. Also, the table indicated that 17.7% of the respondents were people working in the organized private sectors, such as banks, construction companies, professional firms/organization. Equally important is the inference from the table that, 63.4% of the retirees in Abuja lived in Gwarinpa. This could be attributed to the high concentration of good quality houses in the areas. Furthermore, 48% of the unemployed residents lived in Kubwa and Gwagwalada. This could be because Kubwa and Gwagwalada have basic infrastructures like pipe-borne water and good distribution houses of various qualities for people of various income levels.

On the overall, 31.2% of Abuja residents were civil servants while10.1% were retirees. It was also inferred that 17.7% were engaged with the organized private sector.

Of importance is resident's income in relation to their occupation and housing choice. For convenience, resident's incomes were grouped into three. These are low, middle and high. Low income workers were those earning below N25, 000.00 per month. Assuming they are in government service, they will be on grade level 01-06. The middle income class were workers on grade level 07-10, earning between N25,000-N69,999 while high income class are assumed to be on salary grade level 12 and above or earning between N70,000 – N274,000 per month. Upon these classifications, findings from the survey were as presented in Table 1.

The table indicates that on the whole, 49.1% of the respondents in the study area were low and middle income earners. A breakdown indicated that, 13.3% and 35.8% were in low and middle income levels respectively. While 50.9% were high income earners.

Table 1: Resident's distribution into income group

Income level per month	No of respondents	%
Low < (N25,000)	114	13.3
Middle (N25,000-60,000)	308	35.8
'High (N70,000 – N274,000)	437	50.9

Source: Authors' Field Survey, 2018

In Kuje, the predominant housing type was the traditional housing. This represented 58.7% of the respondents choice of home. Again the largest population here were made up of the indigenous Gbagyi tribe. Their choice of house was probably dictated by low cost of living and cultural orientation. The next most common type of housing was the self contained and one bedroom flat apartment (36.5%); usually occupied by non-indigenous residents.

Further analysis revealed that the predominant (56.2%) housing type in Gwagwalada were self contained and one-bedroom flat. This was deemed to be due to the Ward being a University Town and home to paramilitary officers whose families do not reside in Abuja.

In Kubwa, 41.1% of the respondents lived in self contained and one bedroom flats. Also, the study asserted that 15.2% of the sampled population lived in duplex. In the same vein, a check on Abaji central ward revealed that 53.8% of respondents lived in traditional houses while 33.9% lived in identified self contained and one bedroom flats. This drift was ascribed to the location of the Ward as the farthest (114km) to the central business district of Abuja and therefore most of the inhabitants had developed a lifestyle independent of the city centre.

All in all, it was observed that a general hierarchichal trend in the housing had been figured out in Abuja; where housing quality was observed to decrease with increase in distance from CBD. Thus, most houses in Gwarinpa are discovered to be of high standard with well landscaped and good parking spaces. While In Kubwa, the houses were of lower quality than in Gwarinpa, nevertheless at lower cost. Similarly, lowest quality houses were found in Gwagwalada, Kwali, Kuje and Abaji wards.

Altogether, the study revealed that housing value/rent and quality in Abuja decreases with increase in distance from the central business district. Thus, Gwarinpa, Kubwa, Kuje about 20km, 29km and 38km respectively from the central business district had relatively good quality houses while Gwagwalada, Kwali and Abaji about 55km, 66km and 114km respectively from the central business district had lowest quality houses.

Furthermore**,** survey conducted revealed that most houses (69.6%) in Abuja are rental housing; while personal home ownership accounted for just 19.0% of the houses in the study area.

The findings across the selected wards also indicated that rental housing are predominant in Gwarinpa (69.4%), Kuje Central (91.3%), Gwagwalada (56.9%) and Abaji Central (72.3%). Personal homeownership is common in Kwali as Table 2 revealed that 51.5% of the houses in this ward are personal homes.

Table 2: Age group of respondents

Age group in years	No of respondents	%
Youth (18-30)	122	14.2
Young adult (31-60)	708	82.4
Adult (above 60 years)	29	3.4
Total	**859**	**100.0**

Source: Authors' Field Survey, 2018

Table 3: The Distribution of Respondent into different educational status by ward

	Educational Status													
	No formal Education		Primary six		Secondary		Grade II		NCE		ND/HND		University degree		Total	
Ward	**Feq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Gwarinpa	15	(5.2)	13	(4.5)	21	(7.3)	17	(5.9)	51	(17.7)	40	(13.9)	131	(45.5)	288	33.5
Kwali central	14	(20.6)	10	(14.7)	5	(7.4)	3	(4.4)	11	(16.2)	11	(16.2)	14	(20.6)	68	7.9
Kuje central	6	(5.8)	5	(4.8)	3	(2.9)	12	(11.5)	36	(34.6)	12	(12.5)	29	(27.9)	104	12.1
Gwagwalada central	7	(5.1)	5	(3.6)	7	(5.1)	9	(6.6)	27	(19.7)	27	(19.7)	55	(40.1)	137	15.9
Kubwa	5	(2.5)	4	(2.0)	5	(2.5)	13	(6.6)	41	(20.8)	55	(27.9)	74	(37.6)	197	23.0
Abaji central	5	(7.7)	10	(15.3)	9	(13.8)	14	(21.5)	3	(4.6)	3	(4.6)	21	(32.3)	65	7.6
Total	**52**	**(6.0)**	**47**	**(5.5)**	**50**	**(5.8)**	**68**	**(7.9)**	**169**	**(19.7)**	**149**	**(17.3)**	**324**	**(37.7)**	**859**	**(100)**

Source: Authors' Field Survey, 2018

Table 4: Occupational Distribution of Residents by Ward

	Occupational category							
	Public sector	Organised private sector	Civil servants	Artisan	Retirees	Unemployed	Schooling	Total
Ward	**Freq. %**	**Freq. %**	**Freq. %**	**Freq. %**	**Freq. %**	**Freq. %**	**Freq. %**	**Freq. %**
Gwarinpa	39 (13.5)	101 (35.1)	44 (15.3)	16 (15.6)	52 (18.1)	11 (3.8)	25 (8.7)	288 33.5
Kwali central	7 (10.3)	5 (7.4)	31 (45.6)	12 (17.6)	2 (2.9)	7 (10.3)	4 (5.9)	68 7.9
Kuje central	71 (6.7)	8 (7.7)	53 (51.0)	5 (4.8)	13 (12.5)	12 (11.5)	6 (5.8)	104 12.1
Gwagwalada central	9 (6.6)	14 (10.2)	47 (34.3)	6 (4.4)	12 (8.8)	18 (13.1)	31 (22.6)	137 15.9
Kubwa	13 (6.6)	21 (10.7)	82 (41.6)	51 (25.9)	6 (3.0)	17 (8.6)	7 (3.6)	197 23.0
Abaji central	6 (9.2)	3 (4.6)	11 (16.9)	34 (52.3)	2 (3.0)	8 (12.3)	1 (1.5)	65 7.6
Total	**81 (9.4)**	**152 (17.7)**	**268 (31.2)**	**124 (14.4)**	**87 (10.1)**	**73 (8.5)**	**74 (8.6)**	**859 (100)**

Table 5: Resident's distribution into income group

Income level per month	No of respondents	%
Low < (N25,000)	114	13.3
Middle (N25,000-60,000)	308	35.8
'High (N70,000 – N274,000)	437	50.9

Source: Field Survey, 201

Table 6: Resident's housing typology

	Traditional		Self contained row housing		One bedroom flat row housing		Two/three bedroom flat		Block of flat		Duplex		Total	
Ward	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Gwarinpa	5	1.7	29	10.1	58	20.1	134	46.5	6	2.1	56	19.4	288	33.5
Kwali central	21	30.9	32	47.1	14	20.6	1	2.9	0	0	0	0	68	7.9
Kuje central	61	58.7	20	19.2	18	17.3	2	1.9	1	1.0	2	1.9	104	12.1
Gwagwalada central	26	19.0	45	32.8	32	23.4	20	14.6	3	2.2	11	8.0	137	16.0
Kubwa	33	16.8	54	27.4	27	13.7	47	23.9	6	3.0	30	15.2	197	22.9
Abaji central	35	53.8	12	18.5	10	15.4	5	7.7	1	1.5	2	3.1	65	33.5
Total	**181**	**21.1**	**192**	**22.4**	**159**	**18.5**	**209**	**24.3**	**17**	**1.9**	**101**	**11.8**	**859**	**100.0**

Source: Authors' Field Survey, 2018

Empirical Determination of Factors of Housing Choice in Abuja

Multilevel modeling using multinomial logistic regression model is employed to identify the determinants of housing choice by allowing for interrelationships among the various variables measured. In analyzing the factors, certain housing attributes were identified as shown in Table 7.These attributes were classified as locational, quality and neighbourhood attributes of housing.

Table 7: Factors of Housing Choice.

Variables	Location, quality and neighbourhood attributes of housing
V21a	Environment that conforms with cultural norms
V21b	Housing near CBD
V21c	Preference for self-contained house
V21d	Preference for two/three bedroom flat
V21e	Preference for block of flats
V21f	Preference for duplex
V21g	Preference for a house with large kitchen and living room space
V21h	Availability of variety of housing types at affordable rent/value
V21i	Preference for house with toilet in every room and visitors toilet
V21j	Opportunity for squatting and easy and cheap transportation
V21k	Safe, prestigious environment with good infrastructure
V21l	Lower cost of living
V21m	House near my place of work
V21n	House near my children's school

Using Multinomial logistic model ,the probability of chosing one outcome category over the probability of choosing the baseline category is referred to as relative risk or the odds. The resultant models could be depicted as below:

$$\text{Log}\left(\frac{P}{1-P}\right)\beta_0 + \beta_1 X_1 + \beta_2 X_2 - - - - - - - \beta_k X_n$$

Where β_0, β_1---- β_k were the unknown parameters of the model estimated by likelihood techniques and $\log\left(\frac{P}{1-P}\right)$ is the outcome variable. It represents the log odds of making a location, quality and neighbourhood attribute choices. A change in the value of any X will indicate the likelihood of change in $\log\left(\frac{P}{1-P}\right)$ given that other X_s were constant. The X_s were the independent variables.

Accordingly, modeling of the determinants of location, quality and neighbourhood attribute choices were carried out using Multinomial Logistic Regression Model; as models one, two, and three respectively.

Model One (Built using STATA 12 Soft ware Computer Programming)

Determinants of Housing Location Attributes Choice Model

Multinomial logistic regression model of location attributes choice is as indicated in Table 8. The model examines the factors that determine residents location attributes choice behaviour in the six identified wards of the study area. These wards are Gwarinpa, Kwali central, Kuje central, Gwagwalada central, Kubwa and Abaji central wards. The dependent variables were the six identified wards locations for the study. These wards includes Gwarinpa, Kwali Central, Kuje Central, Gwagwalada Central, Kubwa and Abaji Central ward, while the predictor (independent) variables were the gender, marital status, educational status and occupation status of the respondents. Results of the descriptive statistics such as the likelihood ratio (LR) chi-square was 339.69, P= 0.000. Thus using STATA 12 software, a program was written as below:

mlog ward I v1i v2i age group I v4 I v5

Where ward indicates the available location attributes choice, namely Gwarinpa, Kwali Central, Kuje Central, Gwagwalada Central, Kubwa and Abaji Central, while vi (gender), and v2 marital status were the independent variables. The reference category was Gwarinpa. The resultant model of housing location attributes choice is as indicated in Table 8.

Table 8: Multinomial logistic Model of Housing Location Attributes Choice

Variables	Odds ratio (Standard Error)	P-value	95% CI
location attributes choice			
Gwarinpa	RC		
(a) Kwali, Kuje/Abaji Central Ward			
Gender			
Male	RC		
Female	1.92 (0.31)	0.030	1.474 – 1.818
Marital Status			
Married	RC		
Single	1.744 (0.340)	0.019	1.303 – 1.826
Divorced	1.525 (0.326)	0.005	1.1557 – 1.31
Widow	1.20 (0.89)	0.020	1.283 – 3.131
Single parents	0.863 – (0.634)	0.842	0.204 – 0.642
Educational Status			
No Formal Education	RC		
Primary	0.84 (0.50)	0.084	0.261 – 2.753
Secondary	0.17 (0.11)	0.010	0.045 – 0.651
Grade II	0.12 (0.10)	0.010	0.025 – 0611
NCE	0.16 (0.99)	0.003	0.048 – 0.539
OND/HND	0.18 (0.11)	0.007	0.056 – 0.627
Degree	0.071 (0.04)	1.051	0.023 – 0.627
Age			
Adult	RC		
Youth	0.32(0.21)	0.021	1.203-1.512
Young Adult	0.10 (0.31)	0.004	2.131 – 2.513
Occupation			
Not working	RC		
Retired	5.27 (7.86)	0.050	0.283 – 1.101

Private or Professional	6.42 (6.92)	0.044	0.777 – 1.080
Civil Servant	10.70 (11.50)	0.027	1.302 – 1.979
Informal Sector/Artisan	5.72 (6.56)	0.028	0.605 – 1.214
Constant	0.22	0.11	3.2
Gwarinpa	RC		
(a) Gwagwalada Central			
Gender			
Male	RC		
Female	1.08 (0.27)	0.040	0.660 – 1.785
Marital Status			
Married	RC		
Single	1.27 (0.40)	0.039	0.606- 1.382
Divorced	0.47 (0.23)	0.035	0.177 – 1.263
Widow	0.99 (0.59)	0.041	0.309 – 2.191
Single Parents	0.46 (0.32)	0.049	0.120 – 1.804
Educational Status			
No Formal Education	RC		
Primary	0.56 (0.42)	0.049	0.133 – 2.439
Secondary	1.33 (0.22)	0.0107	1.087 – 1.268
Grade II	0.57 (0.39)	0.047	0.152 – 2.176
NCE	0.52 (0.30)	0.020	0.164 – 1.655
OND/HND	1.59 (0.035)	0.021	0.186 – 1.926
Degree	1.38 (0.21)	0.050	1.127 – 1.134
Age			
Adult	RC		
Youth	1.11 (0.31)	0.03	1.102 – 1.520
Young Adult	0.10 (0.91)	0.05	2.001 – 2.312
Occupation			
Not working	RC		
Retired	1.48 (0.00)	0.001	1.529 – 1.659
Private/Professional	0.18 (0.48)	0.041	0.756 – 2.509
Civil Servant	1.62 (0.63)	0.013	1.756 – 2509

Informal Sector/Artisan	0.19 (0.17)	0.051	0.035 – 1.121
Constant	0.31	0.20	4.3

Variables	**Odds ratio (standard Error)**	**P-value**	**95%CI**
Gwarinpa	RC		
(b)Kubwa			
Gender			
Male	RC		
Female	1.59 (0.14)	0.013	1.369 – 0.957
Marital Status			
Married	RC		
Single	3.50 (1.03)	0.000	1.965 – 2.255
Divorced	1.20 (0.47)	0.030	0.560 – 1.604
Widow	1.78 (1.89)	0.008	1.414 – 2.103
Single Parents	1.10 (1.44)	0.014	1.252 – 1.717
Educational Status			
No Formal Education	RC		
Primary	1.04 (0.83)	0.059	0.216 – 5.008
Secondary	0.64 (0.49)	0.056	0.146 – 2.854
Grade II	2.90 (1.99)	0.012	0.750 – 11.135
NCE	3.00 (1.854)	0.036	0.892 – 2.136
OND/HND	3.62 (2.23)	0.038	1.074 – 12.238
Degree	1.69 (1.01)	0.035	0.527 – 5.468
Age			
Adult	RC		
Youth	1.21 (0.71)	0.04	1.021 – 1.321
Young Adult	2.11 (1.21)	0.001	2.111 – 2.345
Occupation			
Not working	RC		
Retired	2.02 (0.00)	0.0487	1.021-1.131
Private/Professionals	8.79 (5.13)	0.002	1.797 –2. 617
Civil Servant	4.31 (2.49)	0.011	1.390 – 3.376

Informal Sector/Artisan	4.94 (3.76)	0.036	1.113 – 2.951
Constant	2.61	0.15	3.3

*P< 0.05;RC= reference category;
Source: Computer Output, 2018

It was revealed that female respondents were significantly 1.9 times more likely to make a choiced house (rent or buy) in Kwali Kuje/Abaji ward instead of Gwarinpa than their male counterpart. (OR = 1.9, P< 0.05, 95% CI = 1.474 – 1.818).

The table also indicates that single, divorced and widowed people were significantly more likely to make a choice house (rent/buy/lense) in Kwali Central ward instead of Gwarinpa than their married colleague (OR = 1.7, P< 0.05 95% CI = 1.303 – 1.826; OR 1.5, P< 0.005, 95% CI = 1.55 – 1.31; and OR = 1.2, P< 0.05, 95% CI = 1.28 – 5.131).

Furthermore, analysis revealed that a retiree, was more likely to make a choice house in kwali/kuje/Abaji ward instead of Gwarinpa than their unemployed counterpart (OR = 5.27, p < 0.05, 95% = 0.283 -1.101).

The results could be due to the fact that, housing value/rent in Kwali, Kuje and Abaji were relatively lower than Gwarinpa while the environment in Kwali was semi – rural and less chaotic. This could have informed the choice of Kwali by residents with lower socio-economic status while residents of high socio-economic status lived closer to CBD with the advantage of being nearer to the central government and therefore obtained first hand information in the city.

Expressively, determinants of location attributes choice of Gwarinpa, Kuje, Kwali and Abaji were socio-economic status and nearness to CBD. This result is in conformity with findings of earlier studies by Burgess (1924, 1967), Fusell, E; Sastry W. and Vanlandingham (2010) which conclude that the growth of modern cities had evolved predictable residential distribution based on residents' socio-economic status (social status and social classes) where residents of high educational status, good jobs and the highly respected in the society lived in the city centre while those of lower status live in the suburbs.

Again, the model also revealed that for Gwagwalada ward, female residents were significantly 1.0 times more likely to make a choiced house (rent or buy) in Gwagwalada instead of Gwarinpa than male respondents (OR = 1.08 P< 0.05, 95% CI = 0.66 – 1.78). Similarly, the odd of a single making a housing choice (rent or buy) in Gwagwalada instead of Gwarinpa was significantly higher than that of married respondents (OR = 1.27, P< 0.05, 95% CI = 0.686 – 2.382). However, the table revealed that the odd of a single parent making a housing choice (rent or buy) in Gwagwalada instead of Gwarinpa was low than that of married residents (OR = 0.46, P< 0.05, 95% CI = 0.120 – 1.804.

Further indepth analysis revealed that the odd ratio of some secondary school leavers, OND/HND and degree holders choosing a home in Gwagwalada instead of Gwarinpa was significantly higher than that of respondents without formal education (OR = 1.33 P< 0.05, 95% CI = 1.087 – 1.268; OR = 1.59 P< 0.005, 95% CI = 0.186 – 1.926 and OR = 1.38, P< 0.05 95% CI = 1.27 – 1.34). This drive was due to the fact that Gwagwalada, though relatively far from the central business district, is the site of the University of Abuja and headquarters of paramilitary offices (immigration, prison and civil defence).

Likewise, the logistic analysis also inferred that the odd ratio of a retiree, artisan and civil servant making a choiced housing (rent or buy) in Gwagwalada was significantly higher than that of a Banker/Architect/Town planner or Engineer (OR = 1.48 P< 0.05, 95% CI = 1.529 – 1.659; OR = 0.19, P< 0.05, 95% CI = 0.035 – 1.121; OR = 1.62, P< 0.05 95% CI = 1.756 – 2.509 and OR = 0.18 P< 0.05 95% CI = 0.756 – 3.509 respectively. It was revealed that a youth is 1.11 times more likely to make a choice house in Gwagwalada instead of Gwarinpa than their adult counterpart (OR = 1.11, p < 0.05, 95% CI = 1.102 -1.520). However, young adult where found to be 0.10 times less likely to make a choice house in Gwagwalada instead of Gwarinpa than their adult counterpart (OR = 0.10, p < 0.05, 95% CI = 2.001 – 2.312).

DISCUSSION

Evidently, the above results on Gwagwalada confirm the earlier findings of this study that most residents of Gwagwalada live there for the reasons of closeness to their places of work or school. The inference from a research carried out by this is in agreement with Aluko (2011) on people living in Lagos Island, which revealed that the residents choice of

dwellings were determined by the two reasons of closeness to their place of work and affordability.

By and large, the factors that determine location attributes choice in Gwagwalada above other locations in Abuja are socio economic status (social status and social class) and closeness to place of work.

Equally important is the results of location attributes choice model for Kubwa. It was affirmed that female residents in Abuja were less significantly likely to make a housing choice in Kubwa rather than Gwarinpa (OR = 1.59, P< 0.05, 95% CI = 1.369 – 0.937). Further analysis also unveiled that a single was significantly twice more likely to make a choiced house (rent or buy) in Kubwa in lieu of Gwarinpa (OR = 1.59, P< 0.05, 95% CI = 1.965 – 6.255) than a married respondent. In the same vein, divorcees and widowed people were significantly more likely to make a choiced house in Kubwa in place of Gwarinpa (OR = 1.2 P< 0.05 95% CI = 0.560 – 2.604 and OR = 1.78 P, 0.05, 95% CI = 1.414 – 2.103). However, odd ratio of a single parent making a choiced house in Kubwa in preference to Gwarinpa was significantly more than a married couple (OR = 1.90, P< 0.05, 95% CI = 1.252 – 1.717. Indepth analysis also revealed that NCE holders and civil servants were significantly more likely to make choiced house in Kubwa as an alternative to Gwarinpa than a respondent with no formal education or an unemployed respondent (OR = 1.69, P< 0.05 95% CI = 0.892 – 2.138 and OR = 4.31, P< 0.05 95% CI = 1.390 – 3.376).

Furthermore, it could be deduced from above that, high odd ratios of making housing choice in Kubwa instead of Gwarinpa were observed among respondents who were youths, females, single, as well as degree holders and civil servants. The reasons given by most respondents was due to the closeness of Kubwa to CBD, availability of pipe-borne water and relatively affordable housing. As a result, major determinants of housing choice on Kubwa could be summarized as; closeness to CBD, availability of pipe-borne water and affordability. The findings above are in conformity with the study of Burgess (1925, 1967) who described a place of Kubwa status as the zone of independent working men's homes. The study by Fusell et al (2010) similarly characterized a settlement like Kubwa as a community of individuals of relatively low economic status who were concentrated as part of century long process of residential segregation by race and socio-economic status.

In sum, multinomial logistic regression model of location attributes choice in Abuja could be illustrated as below thus:

$$\log \frac{\Pr\ (y = j)}{\Pr\ (y = j^{i})} = \alpha\ +\ \beta_1\ + X_1\ + \beta_2\ X_2\ + \beta_3\ X_3$$

Where j = identified category

j^1 = referred category

α = constant

β = odd ratio

$$\log \Pr\ (y)\ = \frac{Gwarinpa}{Kwali/\ Kuje/\ Abaji/\ Gwagwalada\ and\ Kubwa} =$$

$$\alpha + \beta_1 gender\ + \beta_2 marital\ \ status\ + \beta_3 age\ + \beta_4 education\ + \beta_5 ocucpation$$

Model Two (Built using STATA 12 Soft ware Computer Programming)

Determinants of Housing Quality Attributes Choice Model

The model for the multinomial logistic regression examines factors that determined resident's quality attributes choice behavior given the available attributes in the study area. The results are as indicated in Table 9. The dependent variables were the preferred quality attributes choices. These were houses with toilets in every room including the visitors toilet, housing with good physical condition, houses with large kitchen and living room spaces. The independent variables were the gender, marital status, educational status and occupation status of the respondents.

Results of the descriptive statistic; the likelihood ratio (LR) chi-square was 312.11, P = 0.000. Therefore using STATA 12 software, a programme was written as below:

mlog vb20 iv1i, v2i age group, where vb20 indicates quality attributes, v1 (gender), v2 (marital status). The reference category was preference for housing with toilets in every room and visitor's toilet. The resultant model of quality attributes choice is as indicated in Table 4.29 It was evidenced that female respondents were less likely to make a choiced house than male residents based on its good physical condition and provision of toilet in every room and availability of visitor's toilet (OR = 0.07, P< 0.05, 95% CI = 0.72 – 1.58).

Table 9:Multinomial logistic Model of housing quality attributes choice

Variables	Odds ratio (standard Error)	P-value	95% CI
Quality attributes choice			
Each room with toilets and visitors toilet	RC		
(a)Good physical condition (tarred road, drainage, security)			
Gender			
Male	RC		
Female	0.07 (0.21)	0.019	0.72 – 1.58
Marital Status			
Married	RC		
Single	0.77 (0.19)	0.002	0.480 – 1.255
Married	0.86 (0.30)	0.040	0.425 – 1.719
Widow	0.96 (0.41)	0.025	0.415 – 2.220
Single parents	1.55 (0.22)	0.012	1.254 – 1.240
Educational Status			
No formal Education	RC		
Primary six	0.59 (0.28)	0.023	0.232 – 1.530
Secondary	0.47 (0.22)	0.011	0.184 – 1.217
Grade II	0.25 (0.11)	0.050	0.099 – 0.630
NCE	0.27 (0.11)	0.002	0.125 – 0.619
OND/HND	0.35 (0.15)	0.013	0.155 – 0.799
Degree	0.26 (0.10)	0.020	0.122 – 0.557
Age			
Adult	**RC**		
Youth	1.02 (0.31)	0.002	1.212 - 1536
Young Adult	1.31 (0.51)	0.013	1.002 – 1.513
Occupation			
Not working	RC		
Retired	0.13 (0.11)	0.019	0.024 – 0.715
Private/professional	0.63 (0.23)	0.021	0.308 – 1.310
Civil Servant	1.43 (0.52)	0.032	0.697 – 1.944
Informal sector/Artisan	0.67 (0.34)	0.044	0.251 – 1.822
Constant	0.73	0.11	5.1

Variables	Odds ratio (standard Error)	P-value	95% CI
Each room with toilet and visitor's toilet	**RC**		
(b) Good infrastructure, large kitchen and living room spaces, good ventilation			
Gender			
Male	RC		
Female	1.06 (0.23)	0.035	0.686 – 1.646
Marital status			
Married	RC		
Single	1.15 (0.30)	0.041	0.686 – 1.956
Divorced	1.42 (0.54)	0.033	0.674 – 3.025
Widow	1.44 (0.67)	0.022	0.583 – 3.590
Single parents	0.50 (0.26)	0.001	0.180 – 1.397
Educational Status			
No formal education	RC		
Primary Six	0.18 (0.12)	0.014	0.459 – 0.706
Secondary	0.34 (0.19)	0.050	0.11 – 1.073
Grade II	0.31 (0.16)	0.029	0.108 – 0.888
NCE	0.60 (0.14)	0.012	0.121 – 0.771
OND/HND	1.58 (0.18)	0.045	0.148 – 0.977
Degree	1.68 (0.13)	0.006	0.120 – 0.698
Age			
Adult	RC		
Youth	0.10 (0.61)	0.004	2.345 – 2.742
Young Adult	2.01 (0.31)	0.05	1.210 – 1.521
Occupation			
Not working	RC		
Retired	0.08 (0.10)	0.047	0.007 – 0.971
Private/professional	1.60 (0.25)	0.022	1.263 – 1.376
Civil Servant	1.58 (0.65)	0.003	1.705 – 3.577
Informal sector/Artisan	0.37 (0.24)	0.018	0.105 – 1.328

Constant	2.4	0.12	3.6

*P < 0.05; RC = reference category

Source: Computer Output, 2018

Further inquiry into the analysis manifests that singles, divorcees as well as widows had low odd ratios in making a housing choice at any location in Abuja taking into consideration, good physical condition of the house as an alternative to having toilets in every room and visitor's toilet (OR = 0.77 P< 0.05, 95% CI = 0.480 – 1.258), OR = 0.86, P< 0.05, 95% CI = 0.425 – 1.719 and OR = 0.96 P< 0.05, 95% CI = 0.415 = 2.220. On the other hand, single parents had higher odd ratio making a housing choice in Abuja on account of good physical condition in preference to availability of toilets in each of the rooms and visitor's toilet (Or = 1.55, P< 0.05 95 CI = 1.254 – 1.240).

Additionally, it was also revealed that a degree holder, OND/HND/NCE as well as Grade II certificate holders all had lower odd ratio, than a resident without formal education in making housing choice decision in Abuja by reason of good physical condition in contrast to a house having toilets in every room and visitor's toilet (OR = 0.26 P< 0.05 95% CI = 0.122 – 0.557, OR = 0.35 P< 0.05 95%, CI = 0.155 – 0.799). Also, youth were 1.02 times more likely to make a choice house going by its good physical condition in lieu of availability of room with toilets than there are adult counterpart (OR = 1.02, p < 0.05, 95% CI = 1.212 – 1.536). In the same vein young adult were 1.31 times more likely to make a choice house going by its good physical condition instead of toilet in all rooms than their adult counterpart (OR = 1.31, p < 0.05, 95% CI = 1.002 – 1.513). Further explanation on the table reveals that residents working in private sectors, civil servant as well as artisans all had lower odd ratio than unemployed respondents in choosing a home going by good physical condition for houses with toilets in every room and visitor's toilet (OR = 0.63, P< 0.05 95% CI = 0.308 – 1.310, OR = 1.43 P< 0.05 95% CI = 0.697 – 2.944 and OR = 0.64 P< 0.08 95% CI = 0.251 – 1.822).

The table further brings to light the fact that female respondents had lower odd ratio than male residents in choosing a home based on availability of infrastructure, large kitchen and building room spaces in preference to a house having toilets in every room and visitor's toilet (OR = 1.06 P< 0.05 95% CI = 0.686 – 1.646).

Nevertheless, a single parent and singles indicated higher odd ratio than married residents in choosing a home on the preference of good infrastructure (water, road, electricity) large kitchen and livingroom space in lieu of availability of toilets in every room and visitor's toilet (OR = 0.50, P< 0.05 95% CI = 1.80 – 1.397, OR = 1.15 P< 0.05 95% CI = 0.686 – 1.956). Also, degree or OND/HND holders were found to be twice significantly more likely to choose a home (rent or buy) than a resident without formal education; based on availability of good infrastructure, large kitchen and living room space in preference to a home with toilets in every room, and visitor's toilet (OR = 1.68 P< 0.05 9% CI = 0.120 – 0.698; OR = 1.58 P< 0.05. 95% CI = 0.148 – 0.977). Youth were less likely to make a choice house by reason of large kitchen and living room spaces instead of toilet in rooms than their adult counterpart (OR = 0.101, p < 0.05, 95% CI = 2.345 – 2.742). However, a young adult was 2.01 times more likely to make a choice house going by availability of good infrastructure instead of toilet in every room than their adult counterpart (OR = 2.01, p < 0.05, 95% CI = 1.210 – 1.521). In the same vein, residents working in private sectors and senior civil servants were discovered to have higher odd ratios choosing a home on the basis of availability of good infrastructure, large kitchen and living room space (OR = 1.60, P< 0.05 95% CI = 1.263 – 1.376, OR = 1.53 P< 0.05 95% CI = 1.795 – 3.577).

DISCUSSION

Largely, main determinants of structural attribute choice could be quantized as toilets in every room and visitor's toilet, good infrastructure, large kitchen and living spaces. This result conforms to earlier findings that provision of adequate toilet, waste disposal points in homes ensure hygienic living and prevent the occupants against incidence of typhoid, cholera, dysentery and guinea worm, while house with large kitchen and living room spaces with good ventilation will ensure good lightning, thus preventing eye sight problems and also prevent against respiratory diseases such as Bronchitis and asthma (Coker et al., (2006) and Adeleye et al., (2014).

In sum, multinomial logistic regression model of structural attributes could be depicted thus:

$$\log \Pr(y) = \frac{\textit{room with toilet and visiot's toilet}}{\textit{Good phsyical condition, good infrastructure large kitchen and living space and good ventilation}}$$

$$= \alpha + \beta_1 \text{ gender} + \beta_2 \text{ marital status} + \beta_3 \text{ age} + \beta_4 \text{ education} + \beta_5 \text{ occupation.}$$

Model Three (Built using STATA 12 Soft ware Computer Programming)

Determinants of Housing Neighbourhood Attributes Choice Model

The results of multinomial logistic regression model of housing neighbourhood attributes choice in Abuja is as indicated in Table 10. It examines factors that determined neighbourhood attribute choice behavior of residents given the available neibourhood attributes in the study area. Thus, the available housing neighbourhood attribute choices were the dependent (outcome) variables. There includes houses close to CBD,houses close to major market traditional housing, house in a perceived safed neighbourhood, and houses in neighbourhood that has good schools. Predictor (independent) variables were the socioeconomic characteristics of the respondents. These includes the gender, marital status, educational status, and occupational of the respondents. Descriptive statistic results such as likelihood ratio (LIR) chi-square for the building of the model was 317.90 while the level of significant P-value was set at ≤ 0.05. The Risk Response Ratio (RRR) is defined for the model as the increase in the relative risk (odds) of mutually exclusive dependent variables (the choice) given independents variables. (socio-economic variables)

Therefore, using STATA 12 software we write a programme in the do file as follows:

mlogit vb12 i. v1i. v2i. age group i. v4i.

Where vb12 are the dependent (outcome) variables which are distance to major market,distance to CBD,perceived safety,evidence of regular maintenance,landscaped environment,no accumulated waste and availability of good schools. While “I” is categorical by default and removes either the first or the last category as a reference/base line. To this end, v2, v4, v5 were the predictor (independent) variables already imputed by simultaneous entry. Reference categories was choice of house at close distance to CBD. The resultant multinomial logistic regression model of neighbourhood attribute choice is as indicated in Table 10.

Table 10: Multinomial logistic model of housing neighbourhood attributes choice

Variables	Odds ratio (Standard Error)	P-value	95% CI
Housing neighbourhood attributes			
Distance to CBD	RC		
(b) Distance to major market,perceived safety			
Gender			
Male	RC		
Female	1.01 (0.03)	0.042	2.107 – 2.754
Marital status			
Married	RC		
Single	0.04 (0.01)	0.042	1.060 – 1.234
Divorced	0.12 (0.05)	0.031	1.523 – 1.732
Widow	2.11 (0.01)	0.021	1.623 – 3.092
Single parents	0.13 (0.24)	0.015	2.150 – 2.230
Educational status			
No formal education	RC		
Primary six	2.52 (0.15)	0.051	1.30 – 1.560
Secondary	1.02 (0.12)	0.024	2.010-3.021
Grade II	1.13 (0.13)	0.011	2.150 – 3.222
NCE	2.50 (0.15)	0.030	2.201 – 2.853
OND/HND	0.11 (0.72)	0.021	1.102 – 1.551
Degree	0.01 (0.12)	0.011	1.531 – 2.035
Age			
Adult	RC		
Youth	0.12(0.31)	0.001	1.210 – 1.512
Young Adult	1.21 (1.01)	0.012	1.345 – 1.531

Occupation			
Not working	RC		
Retired	2.10 (0.01)	0.013	1.101 – 2.126
Private/professional	0.01 (0.06)	0.052	1.402 – 1.973
Civil Servant	2.51 (0.15)	0.041	1.231 – 1.608
Informal sector/Artisan	3.11 (0.13)	0.012	1.000 – 1.435
Dist. To CBD	**RC**		
(b)Availability of good school, landscaped environment, no accumulated waste.			
Gender			
Male	RC		
Female	2.02 (0.25)	0.053	1.00 – 2.131
Marital status			
Married	RC		
Single	1.15 (0.20)	0.030	2.052 – 2.531
Divorced	2.11 (0.02)	0.042	2.01 – 3.141
Widow	3.10 (0.10)	0.025	1.431 – 2.237
Single parents	2.11 (0.01)	0.015	2.320 – 2.832
Educational status			
No formal education	RC		
Primary school	3.10 (0.31)	0.042	1.531 – 2.004
Secondary	1.21 (0.01)	0.030	1.518 – 2.111
Grade II	2.01 (0.05)	0.021	2.310 – 2.873
NCE	1.12 (0.10)	0.015	1.521 – 2.002
OND/HND	0.03 (0.02)	0.052	2.981 – 3.004
Degree	0.15 (0.04)	0.040	1.230 – 2.141
Age			
Adult	RC		

Youth	0.21 (0.41)	0.010	1.211 – 1.421
Young Adult	1.310 (0.51)	0.024	1.300 – 1.612
Occupation			
Not working	RC		
Retired	1.05 (0.72)	0.0.032	1.153 – 1.975
Private/professional	0.03 (0.12)	0.032	1.105 – 2.320
Civil servant	2.51 (0.13)	0.031	2.142 – 2.543
Informal sector/Artisan	1.13 (0.03)	0.012	1.140 – 1.457
Constant	1.85	0.64	5.7

*P<0.05; RC=refrence category

Source: Computer Output, 2018

It was revealed that female residents were significantly 1.01 times more likely to rent/buy a house than male due to its proximity to a major market or perceived safety rather than its distance to CBD (OR = 1.01, P< 0.05, 95% CI = 2.107 – 2.754). It was also established that a single, single parent or divorcee were significantly less likely to rent or buy a house than married couples considering its distance to a major market or perceived safety instead of its close distance to CBD (OR = 0.04, P< 0.05, 95% CI = 1.060 – 1.234; OR = 0.12, 95% CI = 1.523 – 1.732).

In terms of educational level, the Table shows that a primary six school certificate holder, secondary school certificate holder as well as Grade II and NCE holders were significantly more likely to rent/buy a house than residents without former education due to its distance to major market or perceived safety instead of its distance to CBD (OR = 2.52, P< 0.05, 95% CI = 1.30 – 1.560; OR = 1.02, P< 0.05, 95% CI = 2.150 – 3.222). However, a university degree holder was found to have higher Odd ratio, than a resident without formal education in making housing choice decision in Abuja by reason of its distance to major market or perceived safety in contrast to a house that is enclose distance to Abuja CBD. It was also revealed that a youth is 0.12 times less likely to make a choice house by reason of its distance to major market or perceived safety instead of preference for a house near CBD, than there Adult counterpart. (OR = 0.12, p < 0.05, 95% CI = 1.210 – 1.512). However, a young adult

was discovered to be 1.21 times more likely to make a choice house going by its distance to major market in lieu of its distance to CBD than their adult counterpart (OR = 1.21, p < 0.05, 95% CI = 1.345 – 1.531). Additionally, it was also revealed that retirees, civil servant and Artisans had higher Odd ratio, than unemployed respondents in choosing a home going buy its distance to major market or perceived safety in contrast to a house that is close to Abuja CBD (OR = 2.10, P< 0.05 95% CI = 1.101 – 2.126; OR 2.51, P< 0.05, 95% CI = 1.231 – 1.608). Nevertheless, residents working in private sectors had lower Odd ratio than unemployed residents in choosing a home going by its distance to major market or perceived safety in lieu of a house that is in close proximity to CBD (OR = 0.01, P< 0.05, 95% CI = 1.402 – 1.973). The Table further brings to light the fact that female respondents were 1.01 times significantly more likely than male to choose a home based on availability of school and no incident of waste accumulation in the neighbourhood in preference to neighbourhood that is in closer proximity to CBD (OR = 2.02, P< 0.05, 95% CI = 1.000 – 2.131). In the same vein, singles, divorcees, widowed and single parents had higher Odd ratios than a married couple to rent or buy a house based on availability of good schools, landscaped and neighbourhood without accumulated waste in preference to a house in closer proximity to CBD. Following the same trend, a university degree holder as well as OND/HND holders had lower odd ratio than a resident without a formal education in making housing choice in Abuja by reason of neighbouhood that has good schools, landscaped environment and no accumulated waste in lieu of a house that is in closer distance to city centre (OR = 0.15, P< 0.05, 95% CI = 1.230 – 2.141; OR = 0.03, P< 0.05, 95% CI = 2.981 – 3.004). Youths were found to be 0.210 less likely to make a choiced home by reason of its proximity to good school and landscaped environment instead of consideration of its distance to CBD than their adult counterpart (OR = 0.210, p <0.05, 95% CI = 1.211 -1.421). Further analysis revealed that retirees, civil servant and Artisans had higher Odd ratio than unemployed respondents in choosing a home going by availability of good schools, landscaped environment and no accumulated waste instead of preference for neighbourhood in close proximity to Abuja city centre (OR = 1.05 P< 0.05, 95% CI = 1.153 – 1.975; OR = 2.51, P< 0.05, 95% CI = 2.142 – 2.543; OR = 1.13, P< 0.05, 95% CI = 1.140 – 1.457).

DISCUSSION

It could be surmised that main determinants of housing neighbourhood attribute choice for residents of higher socio-economic status (university degree holder, OND/HND and the

professionals) are preference to live in neighbourhood that is as close to CBD as possible. The reasons given been that neighbourhood in close proximity to city centre provides them with the opportunities to associate with residents of their caliber. However, residents of lover socio-economic status such as unemployed, retirees, civil servant as well as Artisans, the main determinants of housing neighbourhood attribute choice are living in neihgbourhood that is safe, as close as possible to major market and has affordable good schools. As a result, multinomial logistic regression model of housing neighbourhood attribute choice in Abuja could be illustrated as below:

$$\log \frac{\Pr\ (y = j)}{\Pr\ (y = j^{i})} = \alpha\ +\ \beta_1\ + X_1\ + \beta_2\ X_2\ + \beta_3\ X_3$$

Where j = identified category

j^1 = referred category

α = constant

β = odd ratio

$$\log \Pr\ (y) = \frac{Distance to major market/\ \ Safety\ / Availability of good school}{Distance\ to\ CBD} =$$

$$\alpha + \beta_1 gender\ + \beta_2 marital\ \ status\ + \beta_3 age\ + \beta_4 education\ + \beta_5 ocucpation$$

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

The underpinning for this study was, reawakening of the Weber, Berlin and Karl Principles of social status, class and stratification which dictated the general pattern of housing choice based on socio-economic status in the study area (social status and social class). The study suggests that government should try and regulate the housing market (rent/sale) as a short term measure so that residents could have almost equal opportunity to choose their homes. Some of the problems identified relating to making good housing choice are the difficulty in getting government housing land allocation, excessive powers of the supposed state Urban and Regional Planning Board (now called FCTA, Department of Development Control) that relegated the powers of the Local Planning Authorities in the six area councils and rendered them non-functioning, consequently raising housing rent and value prices. The study also identifies the problem of the failure of government and private developers in opening up both the secondary axes (Class II roads) and tertiary axes (Class III roads) which led to the concentration of development (including housing) on the primary axes (Class I roads) corridors. The study also makes recommendation for a less cumbersome land allocation

system, revitalization of the Local Planning Authority, making loan available at low interest rate as well as opening up of inner roads, among others. It is believed that the benefits of this study will help government and private housing developers to formulate housing programmes that will make housing choice a matter of voluntary action and not dictated by class status of the choice maker.

The study provides an initial look on the determinants of housing choice of residents in the six area councils of Abuja. In other words, it provides a base for the study of housing choice in the nation's new Federal Capital Territory, serving as homes to over 250 ethnic nationalities with diverse religious, cultural, linguistic and economic background. The study therefore serves as a point of departure for future research on housing situation in the cities of the developing countries.

Future research should inquire into the step-by-step processes of land allocation in Abuja from inception (in 1976) to date. This will be with the aim of making housing land allocation less cumbersome. Future research could also focus research on the activities of indigenous Gbagyi in the various FCT housing programmes Abuja vis-à-vis the Landswap programme; formerly introduced in Abuja by the Federal Government in February, 2015 to cover nine Districts, namely: Ketti South, Shevetti, Keffi, Shevetti Chechi, Waru Kporzaima, Burum, Burum West, Ketti East and Gwagwa. Furthermore, the study area for this research work is Abuja. Therefore, to give the research a national outlook, similar studies could be conducted to cut across other urban areas in Nigeria.7

REFERENCES

Adeleye O. A., Azeez T. O. and Yusuff I. O. (2014). Perception of Housing quality by residents and non-residents of Ibara Housing Estate, Abeokuta, Ogun State, Nigeria. *American Journal of Human Ecology*. Vol 3 (3) pp. 35 – 42.

Aluko, O. (2011). The Effects of Location and Neighbourhood Attributes on Housing Values in Metropolitan Lagos. *Ethiopian Journal of Environmental Studies and Management*. vol 4. No 2 pp 69 – 82.

Arimah, B. C. (1997). The determinants of Housing Tenure Choice in Ibadan, Nigeria. *Journal of Urban Studies*. Vol. 34 pp. 105-124**.**

Bourassa, S.C. (1995). A Model of Housing Tenure Choice in Australia. *Journal of Urban Economics.* Vol. 37 pp. 161 – 175.

Bourassa,S.C. and Yin. M. (2006). Housing Tenure Choice in Australia and the United States: Impact of Alternative Subsidy Policies. *Real Estate Economics.* Vol. 34 No 2 pp 303 – 328.

Buckley, M.R. and Mathema, S.A. (2007). Is Accra a Superstar City? The World Bank Finance Economics and Urban Department.Policy Research Working Paper.

Burgess E. W, Park R. E and Mckenzie D. (1967). *The City.* The University of Chicago Press. Chicago and London.

Cooker A. O. and Olutoge F. A. (2006). Combacting the guinea worm scourge in Nigeria: An Engineering approach in Falola J and Heaton. M. M (Eds). *Traditional and Modern Health Systems in Nigeria*. African World Press Trenton, NJ pp 417 – 427.

Federal Capital Territory Administration (FCTA, 2008). *Report of the Committee on the Review of Mass Housing Scheme in the Federal Capital Territory,Abuja*.FCTA Press.Area 11 Garki .Abuja.Nigeria.

Fussell E., Castry. N and Vanlandingham M. (2010). Race, Socio-economic status, and the return migration to New Orleans after Hurricane Katrina. *Popul Environ.* Vol. 31 (1-3) pp 20-42.

Green, H (1998). Reaching Young Men with Reproductive Health Programme. Tulane University, School of Public Health and Tropical Medicine.US state of Luisiana.

Lateefat S. O. (2008). *Residential Housing choice in the Core Areas of Ibadan: Ibadan South East Local Government Area as a Case Study*. An Unpublished M.Sc. (Housing) thesis. Department of Urban and Regional Planning, Faculty of Social Science, University of Ibadan, Ibadan, Oyo State Nigeria.

Mills, C. W. (1970). *The Power elite.* New York: Oxford University Press.

Morris, E and Winter, M. (1997). *Housing, Family and Society*. 2nd edition) St. Paul. Mini Department of Design Housing and Apparel, University of Minnesota, John Wiley and Sons. New-York.

Okesoto.J.O, Olayiwola.K.O, and Oke.G.O(2014). Residential location preference of lagos Central Business District working population. *American Journal of Social Issues and Humanities.*Vol.4.No1. pp. 45-53.

Olatubara C. O. (1997). An Alternative Approach to the Urban Residential Location Decision in Nigeria: The Nesting Idea. *Habitat International*. vol. 22 (1) pp. 57 – 67.

Olayiwola, L. M. (2003): *The Future of Public Housing in Nigeria*. A Lecture series Department of Urban and Regional Planning, Obafemi Awolowo University, Ile-Ife. Nigeria

Onibokun, A. G. (1985*): Housing in Nigeria. A Book of Reading in Nigeria:* Nigeria Institute of Social and Economic Research (NISER).

Pickvance, C. G. (1973): Life Cycle, Housing Tenure and Intra-Urban Residential Mobility: A Causal Model. *Sociological Review.* Vol. 21 pp 279 – 297.

Roske, M. D. (1983). *Housing in Transition*. New York, Holt, Rinehart and Winston Publications.

Scheaffer. R.L., Mendelhall. W. and Ott. R. L (2011*). Elementary Survey Sampling* 5th Ed. Belmont, C.A. Duxbury Press.

Shi, L. (2001). *Housing Preferences of Residents in Stellenbosch, South Africa*. An Unpublished Master in Consumer Science (Housing). University of Stellenbosch South Africa.

Sivo S.A, Saunders C, Chang. Q. and Jiang . J. (2006). How Low Should You go? Low Response Rates and Validity of Influence in Questionnaire Research. *Journal of the Association for Information Systems*.Vol. 7 No 6 pp 351-441.

Ukoje.J.E and Kanu. K.U (2014). Implementation and challenge of the Mass Housing Scheme in Abuja, Nigeria. *American International Journal of Contemporary Research.Vol.4.No.4.pp209-218*