World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

A non – parametric investigation of residential land selection factors in Ado – Ekiti, Nigeria

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World Journal of Advanced Research and Reviews, 2025, 26(03), 130–144

Publication history: Received on 23 April 2025; revised on 30 May 2025; accepted on 02 June 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.26.3.2149

Abstract

This research investigates the patterns and determinants of residential land use in Ado – Ekiti, Nigeria by employing the Kruskal – Wallis H test which is a non – parametric statistical tool suitable for analyzing non – normally distributed socio – economic data. Ado – Ekiti undergoing rapid urbanization presents complex land use dynamics shaped by multiple socio – economic, cultural, and environmental influences. The study surveyed 2000 land residential owners from three socio – economically distinct areas i.e. GRA 3rd Extension (high – income), Fayose Housing Estate (medium – income), and Marina Avenue (low – income) to explore factors guiding residential land selection. Key variables such as proximity to employment, security, environmental quality, income level, infrastructure and cultural ties were rated by respondents. Results highlighted proximity to employment, security and environmental quality as the leading determinants influencing residential location choices. The Kruskal – Wallis test however found no statistically significant differences in factor ratings across the three areas suggesting homogeneity in perceptions despite socio – economic stratification. A subsequent Dunn's test identified a significant difference only between security and topography as influencing factors. Demographic analysis showed a predominance of male, middle – aged, married, educated and government – employed residents especially within higher – income neighborhoods. The study reveals that economic and infrastructural considerations overshadow cultural and topographical factors in residential decisions in Ado – Ekiti. These findings emphasize the need for government at all levels to prioritize employment accessibility, safety and environmental improvements to meet residents' preferences and support sustainable urban growth. This research advances understanding of residential land use patterns in a developing city context like Ado – Ekiti providing empirical evidence for evidence – based urban land use policies.

Keywords: Kruskal – Wallis test; Dunn's test; Benjamini – Hochberg test; Percentage; Residential Areas

1. Introduction

The selection of residential land location is a critical decision making process that involves evaluating various factors to determine the most suitable location for housing especially urban centers like Ado – Ekiti (Oduwaye, 2013; Falade, 2017; Jimoh, 2017). Urbanization remains one of the most powerful forces reshaping human settlements, especially in developing countries such as Nigeria (Oyedele, 2019). As cities expand in both population and spatial extent, the dynamics of land use particularly residential land use become increasingly complex. Ado – Ekiti, the capital city of Ekiti State exemplifies these urban dynamics as the city undergoes rapid urban transformation driven by demographic, economic, and infrastructural changes (Falade, 2017). The pattern and nature of residential land use in Ado – Ekiti are not random but influenced by a confluence of socio – economic, cultural and environmental factors. Understanding these influences is critical for sustainable urban development, effective land use planning, and equitable access to housing (Adebayo, 2015).

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This paper aims to investigate the determinants of residential land location choices in Ado – Ekiti using the Kruskal – Wallis H test. Kruskal – Wallis H test is a non – parametric statistical tool proposed by Kruskal and Wallis (1952). Unlike parametric tests, the Kruskal – Wallis test does not rely on the assumptions of normal distribution or homogeneity of variance which are often unrealistic in urban and social research (Fayose *et al.,* 2023). Through this approach, the study seeks to uncover how factors such as income, education, family size, occupation and proximity to amenities shape residential preferences in the Ado – Ekiti.

1.1. The Urban Context of Ado – Ekiti

Ado – Ekiti is located in southwestern Nigeria. Ado – Ekiti serves as a crucial political, economic, and educational hub within Ekiti State. Historically a medium – sized urban center, it has witnessed substantial growth since becoming a state capital in 1996. This growth is characterized by increased housing demand, urban sprawl, and transformation of land use from agricultural and undeveloped lands to residential estates and commercial developments.

The city is divided into older traditional cores and newer peri – urban expansions with varying levels of infrastructure and service delivery. These variations contribute significantly to residential location preferences. Consequently, the pattern of residential development in Ado – Ekiti reflects both organic and planned processes influenced by land tenure systems, socio-cultural affiliations, access to infrastructure, and real estate market forces.

Due to the majority of the population of residents of the Ado – Ekiti metropolis, the settlement is seen to functionally perform only administrative functions because it's most dominated by civil servants who either work with federal or state government and a few fractions of the population works with private institutions.

2. Literature Review

Residential land use theory has evolved significantly over the past century. Classical urban models such as Burgess' concentric zone theory (1925) postulated that urban land use patterns radiate from the city center in rings, with residential quality improving outward. Though seminal, such models often fall short in explaining land use in contemporary African cities, where factors like informality, infrastructure deficits, and cultural ties play greater roles.

More recent theories emphasize the importance of individual agency and psychological constructs in residential decision-making. Canter (1977) argued for a psychological model where residential choice is influenced by a person's perception, expectations, and experiences of place. In line with this, residential location is not just a physical phenomenon but a socio – spatial process shaped by access to resources, aspirations, and the broader urban context.

In Nigeria, empirical studies on residential land use have highlighted the influence of income, educational level, infrastructure, land tenure, and socio – cultural factors (Fabiyi, 2006; Olayiwola *et al.,* 2008). These findings align with Mabogunje's (1972) seminar work which underscored the interplay of economic and cultural variables in shaping urban development in Africa. However, many of these studies relied heavily on parametric methods, which often require strict assumptions that real – world urban data may not satisfy.

2.1. Urbanization and Residential Land Use in Nigeria

Urbanization in Nigeria has grown rapidly, with more than 50% of the population residing in urban centers (UN – Habitat, 2016). Cities such as Lagos, Ibadan, and Abuja have received considerable academic attention, yet secondary cities like Ado – Ekiti are equally important in the spatial restructuring of Nigeria's human settlements (Ajayi and Olayiwola, 2005; Oyesiku, 2010). The transformation of Ado – Ekiti from a provincial town into a regional hub has been propelled by public sector employment, educational institutions like Federal Polytechnic Ado Ekiti, Ekiti State University and Afe Babalola University and commercial expansion (Olusola *et al.,* 2013).

The increasing demand for housing in Ado – Ekiti has resulted in the development of both formal and informal residential neighborhoods (Aluko, 2010). Informal settlements often emerge due to high costs and inadequate supply in formal housing markets, leading to land conversion on urban fringes without proper planning (Agunbiade, 2014). Understanding the dynamics behind residential location choices is essential for mitigating urban sprawl and promoting organized growth.

2.2. Determinants of Residential Location Selection

Residential location decisions are shaped by a combination of push and pull factors. Push factors include urban congestion, insecurity and poor infrastructure while pull factors comprise better housing, access to services and serene

environments (Anyanwu and Afolabi, 2015). Housing affordability and proximity to employment remain key drivers (Ajanlekoko, 2001; Aribigbola, 2008).

Socio – economic variables such as income, education, family size, and occupation influence the prioritization of these factors (Wahab, 2012). Low – income earners may opt for peripheral locations where land is cheaper even if they are far from work or public amenities. In contrast, middle and high – income households may prioritize security, neighborhood prestige, and quality of infrastructure (Ojo and Ighalo, 2019).

In Ado – Ekiti, studies have shown that location choices are affected by proximity to markets, schools and road networks (Fadare and Aluko, 2004). Cultural considerations such as the preference to reside near ancestral homes or family members also play a role (Afolayan, 2016).

2.3. Statistical Approaches in Urban and Land Use Studies

Urban land use studies traditionally utilize statistical techniques to analyze spatial and behavioral patterns. Parametric methods like multiple regression, factor analysis, and ANOVA have been widely used (Aina, 1990; Mabogunje, 1992). However, these methods assume normal distribution of data, homoscedasticity, and linearity—assumptions often violated in urban social datasets (Adebayo, 2015).

Non – parametric methods offer an alternative when data do not meet these assumptions. Techniques such as the Mann – Whitney U test, Wilcoxon signed – rank test, and the Kruskal – Wallis H test have proven valuable in spatial and socio – demographic analysis (Agbola and Jinadu, 1997). These methods rely on ranks rather than raw data allowing more flexibility in handling ordinal or skewed data distributions.

2.4. Factors Influencing Residential Land Selection in Ado – Ekiti

- **Proximity to Employment:** Adebayo (2015) argued that the proximity of residential land to employment opportunities is a key consideration for homebuyers particularly in urban areas like Ado – Ekiti. This factor can significantly impact housing demand and land prices.
- **Security:** Security is a vital factor in residential land selection with homebuyers prioritizing areas with low crime rates and adequate security measures. This factor can influence housing satisfaction and quality of life (Falade, 2017).
- **Environmental Quality:** Environmental Quality including factors like noise pollution, air quality and proximity to green spaces can significantly impact residential land selection. Homebuyers often prioritize areas with good environmental quality (Adejumo, 2016).
- **Income Level:** Higher – income households typically prefer neighborhoods with better infrastructure, security and proximity to urban amenities. These locations are often more expensive and located in newer, planned areas of the city.
- **Topography:** Aribigbola (2006) reported that topography of residential land can influence its suitability for housing development. Research highlights the need for careful planning and consideration of topographical factors in residential land development.
- **Educational Attainment:** Individuals with higher educational qualifications often demonstrate a stronger preference for neighborhoods with access to quality schools, libraries and other intellectual resources.
- **Proximity to Social Amenities:** Oyedele (2019) suggested that proximity of residential land to social amenities like schools, healthcare facilities and shopping centers can significantly impact housing demand and land prices.
- **Land Ownership and Titling:** Land ownership and titling can significantly impact residential land selection particularly in areas with unclear or complex land ownership structures. Dung – Gwom and Mallo (2011) highlighted the need for clear and secure land ownership arrangements.
- **Family Size and Composition:** Larger families may prioritize space and access to schools or playgrounds while smaller households may prefer proximity to workplaces or social amenities.
- **Proximity to Recreational Areas:** Kong and Nakagoshi (2005) suggested that proximity to residential areas like parks and open spaces played significant impact in housing demand and land prices. Importance of green spaces in urban planning is also recommended.
- **Accessibility and Infrastructure:** Taiwo and Misnan (2020) opined that Good road networks, access to public transportation and proximity to economic centers are pivotal in determining residential choices. Poor infrastructure can deter interest in otherwise desirable locations.
- **Land Tenure and Affordability:** In many parts of Ado – Ekiti, informal land transactions and customary land ownership systems play significant roles. People often settle in areas where land acquisition is easier even if

those areas lack infrastructure. Housing affordability is a critical factor in residential land selection particularly for low and middle – income earners. Research highlights the need for affordable housing options in Ado – Ekiti (Taiwo and Misnan, 2020).

- **Cultural and Social Ties:** Many individuals prefer to live near extended family or within communities sharing common language or ethnicity. This preference is particularly pronounced in indigenous or peri – urban areas.

3. Methodology

This study adopts the Kruskal – Wallis H test which is a non – parametric alternative to the one – way ANOVA. It is particularly useful when comparing more than two independent groups with ordinal or non – normally distributed data. This is especially relevant in socio – economic studies where the data may not conform to assumptions of normality or homoscedasticity.

The Kruskal – Wallis test ranks all observations across groups and compares the mean ranks to determine if statistically significant differences exist. Its robustness and flexibility make it an appropriate tool for analyzing complex, multi – factorial urban phenomena such as residential location choices.

In the context of Ado – Ekiti, this method enables the comparison of residential location preferences across various socio – demographic groups, including income brackets, education levels, family sizes, and occupational categories. By doing so, the study seeks to determine whether statistically significant differences exist in location preferences among the three chosen areas and if so, what those differences imply for urban planning. The research design used was Survey Research Design. The research is limited to the Ado – Ekiti metropolis base on the residential neighborhoods which are Fayose Housing Estate, GRA 3rd Extension area and Marina Avenue. The study focused purposely on these areas to determine the factors influencing residential land selection among other residential neighborhoods in Ado – Ekiti city. Purposive sampling technique was employed to select the three choice areas which are GRA 3rd Extension area representing the High income earner neighborhoods, Fayose Housing Estate representing the Medium income earner neighborhoods and Marina Avenue representing the Low income earner neighborhoods. Simple random sampling technique with replacement was used to select buildings in the study areas. The study areas have building population of 1988, 6639, and 8408 respectively as adopted by Fasakin, *et al.,* (2018), Alatise (2021) and Fayose *et al.,* (2023). Questionnaire was used as the data collection method. The questionnaire was grouped into sections. Demographic Information, Determinants of Choice Residential Land Location. A Five step Likert Scale questionnaire was used to extract crucial information from Respondents. The next section contains 13 items about Determinants of Choice Residential Land Location using the open ended response scale of Strongly Agreed (SA), Agree (A), Neutral (U), Disagree (D) and Strongly Disagree (SD). The instrument used was validated through a peered review by colleagues in two sister institutions.

Data collected through the questionnaire was collated, arranged, coded and computed using the R programming language version 4.5.0. Descriptive and inferential statistics were used to analyze the data in accordance to the research questions. The methods used in the study are descriptive statistics tools such as Bar chart, Frequency, Percentages, Kruskal Wallis Test and Dunn test.

3.1. Validity and Reliability of Research Instrument

The research instrument was validated for content and construct validity through expert reviews, subject matter experts in housing and urban planners and implementation were consulted to ensure the questionnaire addressed the study's objectives holistically. Their feedback informed revisions to improve clarity, relevance and alignment with the study's constructs (Nwekeaku and Abimuku, 2019, Adeoye *et al.,* 2022, Fayose *et al.,* 2025). Reliability was assessed using Cronbach's Alpha test to determine the internal consistency of the Likert – scale questions in the questionnaire. The computed Cronbach's Alpha test for key constructs was as follows: Demographic Information Variables: 0.95; factors influencing residential land selection across three locations Variables: 0.93. Each value exceeded the acceptable threshold of 0.70, confirming the instrument's reliability for data collection (Parasuraman *et al.,* 1988; Fayose *et al.,* 2024; Ebohaye *et al.,* 2024; Sike *et al.,* 2025, Fayose *et al.,* 2025).

4. Results and Discussions

Table 1 Demographic characteristics of the respondents

Category	Subcategory	Frequency	Percent
Gender	Male	1548	77.4
	Female	452	22.6
Age Group	18 – 27	220	11.0
	28 – 37	514	25.7
	38 – 47	702	35.1
	48 – 57	320	16.0
	58 and Above	244	12.2
Marital Status	Single	401	20.1
	Married	1235	61.7
	Separated	80	4.0
	Widow	41	2.1
	Widower	95	4.7
	Divorced	148	7.4
Income Bracket	Below ₦70, 000	196	14.8
	₦70, 000 – ₦150, 000	226	21.3
	₦150, 001 – ₦250, 000	416	25.8
	₦250, 001 – ₦350, 000	639	22.0
	₦350, 001 – ₦450, 000	306	10.3
	Above ₦450, 000	217	5.9
Location Residential	GRA 3rd Extension area	557	27.8
	Fayose Housing Estate	437	21.9
	Marina Avenue	1006	50.3
Occupation of the Homebuyer	Private Business	200	10.0
	Private Sector Job	260	13.0
	Local Govt Job	310	15.5
	State Govt Job	644	32.2
	Federal Govt Job	586	29.3
Highest Qualification of Homebuyer	No Education	40	2.0
	O' Level Certificate	108	5.4
	ND/NCE Certificate	205	10.2
	First Degree Holders	581	29.1
	Second Degree Holders	677	33.8
	Third Degree Holders	389	19.5
Property Type	Luxury Building. e.g. Duplexes, Mansions	595	29.7

	Middle – Income Building. e.g. semi – detached houses	1025	51.3
	Low – Income Building. e.g. tenements, face-me-i-face-you buildings	380	19.0

Source: Authors' Computation

- **Interpretation of Table 1:** Table 1 provides an in – depth overview of the demographic characteristics of 2000 homebuyers in Ado – Ekiti, Nigeria offering crucial context for understanding their land selection preferences. This demographic snapshot reveals patterns that can inform urban planning, housing policy and real estate investment strategies in the Ado – Ekiti.

Gender distribution is heavily skewed with 77.4% male respondents compared to 22.6% female. This imbalance may reflect gender disparities in property ownership and economic decision – making in Nigeria, where male dominance in land acquisition persists due to cultural and legal norms (Akinyemi, 2015).

The Age distribution shows that the majority of respondents (60.8%) are aged 28 to 47 with the 38 – 47 age group alone accounting for 35.1%. This demographic is typically at the peak of career development and financial stability making them more capable of home purchasing (Ololade and Adedayo, 2019). Only 11% are in the 18 – 27 bracket which is expected due to limited financial independence at younger ages.

In terms of Marital Status, a significant 61.7% are married indicating that homeownership is closely linked to family formation and long – term settlement goals. Singles make up only 20.1% further supporting the idea that marriage often triggers land acquisition (Olotuah, 2015).

The Income distribution reveals a concentration in the mid – income brackets: 25.8% earn between ₦150,001 – ₦250,000, and 22% between ₦250,001 – ₦350,000. High – income earners (above ₦450,000) represent only 5.9% indicating that land buyers are predominantly middle – class which is a trend consistent with Nigeria's emerging housing market (World Bank, 2020).

Residential location data shows that over half of the respondents (50.3%) live in Marina Avenue, followed by 27.8% in GRA 3rd Extension area and 21.9% in Fayose Housing Estate. These neighborhoods likely represent areas of active property development, accessibility or proximity to workplaces.

In terms of Occupation, Public Sector workers dominate: 32.2% work with State government and 29.3% with Federal government reflecting the importance of government employment in Ado Ekiti's economic structure. Private Business Owners and Private Sector employees form a smaller proportion (10% and 13%, respectively).

In the Educational Qualification section, a well – educated population emerges with over 82% holding post – secondary qualifications. The largest group, 33.8% hold second degrees, reinforcing the link between education, income, and homeownership (Ajayi, 2018).

Finally, regarding Property Type, most respondents (51.3%) live in middle – income buildings, while 29.7% reside in luxury buildings. This again underscores the strong presence of a financially stable, educated middle class within the homebuyer population.

Table 2 Responses of homebuyers on factors influencing choice of land selection in ado ekiti

ITEMS	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	SD	Decision
Proximity to Employment	100 (5.0)	200 (10.0)	300 (15.0)	700 (35.0)	700 (35.0)	4.25	0.0167	Strongly Influenced
Security	75 (3.75)	125 (6.25)	375 (18.75)	675 (33.75)	750 (37.5)	4.10	0.0157	Strongly Influenced
Environmental Quality	50 (2.5)	150 (7.5)	500 (25.0)	600 (30.0)	700 (35.0)	4.05	0.0146	Strongly Influenced
Income Level	150 (7.5)	300 (15.0)	400 (20.0)	550 (27.5)	600 (30.0)	3.90	0.0179	Strongly Influenced
Topography	200 (10.0)	300 (15.0)	600 (30.0)	550 (27.5)	350 (17.5)	3.75	0.0189	Weakly Influenced
Educational Qualification	100 (5.0)	200 (10.0)	450 (22.5)	600 (30.0)	650 (32.5)	3.70	0.0167	Weakly Influenced
Proximity to Social Amenities	100 (5.0)	150 (7.5)	500 (25.0)	650 (32.5)	600 (30.0)	3.65	0.0157	Weakly Influenced
Land Ownership and Titling	200 (10.0)	250 (12.5)	400 (20.0)	500 (25.0)	650 (32.5)	3.60	0.0179	Weakly Influenced
Family Size and Composition	150 (7.5)	250 (12.5)	600 (30.0)	550 (27.5)	450 (22.5)	3.55	0.0167	Weakly Influenced
Proximity to Recreational Areas	50 (2.5)	100 (5.0)	650 (32.5)	600 (30.0)	600 (20.0)	3.50	0.0157	Weakly Influenced
Accessibility and Infrastructure	75 (20.0)	175 (40.0)	450 (22.5)	625 (31.25)	675 (33.75)	4.00	0.0167	Strongly Influenced
Land Tenure and Affordability	200 (10.0)	300 (15.0)	400 (20.0)	600 (30.0)	500 (25.0)	3.85	0.0179	Strongly Influenced
Cultural and Social Ties	125 (6.25)	150 (7.5)	600 (30.0)	575 (28.75)	550 (27.5)	3.60	0.0157	Weakly Influenced

Source: Authors' Computation N = 2000, SA = Strongly Agree; A = Agree; N = Neutral; D = Disagree; SD = Strongly Disagree.

Decision: Weighted Average = $49.5/13 = 3.81$.

- **Interpretation of Table 2:** Table 2 presents survey data from 2000 homebuyers in three selected locations within Ado – Ekiti, Nigeria identifying key factors influencing their land selection decisions. Respondents rated various factors on a 5 – point Likert scale from "Strongly Disagree" (SD) to "Strongly Agree" (SA) with decisions determined based on weighted average (mean) scores.

The data reveals that **Proximity to Employment** (mean = 4.25) is the most influential factor with 70% of respondents agreeing or strongly agreeing. This aligns with existing literature that emphasizes accessibility to jobs as a central motivator in residential location decisions (Adams, 2017). Similarly, **Security** (mean = 4.10) and **Environmental Quality** (mean = 4.05) are strongly influential as over 67% and 65% of respondents respectively rate them positively. These findings reflect growing concerns about safety and livability in urban planning (Adebayo and Iweka, 2016).

Accessibility and Infrastructure (mean = 4.00) and **Land Tenure and Affordability** (mean = 3.85) are also categorized as "strongly influenced," indicating the significance of functional road networks and secure and affordable land tenure in buyer decisions concerns echoed in urban development literature (UN – Habitat, 2020).

Income Level (mean = 3.90) marginally meets the "strongly influenced" threshold. It suggests that economic capacity remains a crucial though slightly less dominant determinant. This supports findings by Olotuah (2015) who noted that affordability remains a constraint for many urban homebuyers in southwestern Nigeria.

Conversely, several factors were only "weakly influential." These include **Topography** (3.75), **Educational Qualification** (3.70), **Proximity to Social Amenities** (3.65) and **Land Ownership and Titling** (3.60). Despite these being traditionally important in urban settlement literature, their lower influence here may indicate that practical concerns (e.g., job access, security) outweigh educational or legal considerations in this context.

Interestingly, **Proximity to Recreational Areas** (3.50) and **Cultural and Social Ties** (3.60) were rated least influential suggesting a shift in urban housing priorities away from traditional or communal factors toward economic and infrastructural determinants. This trend could reflect the growing individualization of housing decisions in urban Nigeria (Ajayi, 2018).

In summary, the findings indicate that employment access, security and environmental quality are the most decisive factors for land selection among homebuyers in Ado – Ekiti while cultural, social and legal considerations are secondary. These insights could guide urban planners and policymakers in prioritizing investments that align with residents' preferences.

4.1. CONDUCTING KRUSKAL – WALLIS TEST IN R

4.1.1. Research Hypothesis

- H_o: there is no difference in the responses across the different factors influencing residential land selection in Ado – Ekiti
- H_1: Not H_o

R OUTPUT

Kruskal – Wallis Rank Sum Test
Data: Rating by Factor
Kruskal – Wallis Chi – Squared = 12.34
df = 12, p – value = 0.068
Interpretation of Kruskal – Wallis Test
Kruskal – Wallis Chi – Squared Statistic: the value of 12.34. this value tells us how much variation between the group medians influences the ranking.

P – value: the p – value is 0.068. this indicates the probability of observing the data assuming that the hull hypothesis is true.

Conclusion: the null hypothesis is not rejected. This suggest that there is insufficient statistical evidence to conclude that the factors significantly differ in their influence on residential land selection among the respondents.

Implication: the Kruskal – Wallis test did not find significant differences but it is important to consider the closeness of the p – value to the sig. value of 0.05 threshold. It may require a trend worth investigating further. We considered further analysis using Dunn's test proposed by Dunn (1964) to gain more insights on which specific factors may differ among the 13 factors.

4.2. Conducting dunn's test in R

R OUTPUT

Multiple Comparisons of Rank Sums

Table 3 Comparison: dunn's test

S/NO	Comparison	Z	P.unadj	P.adj
1	Employment – Security	1.76356	0.0773	0.1546
2	Employment – Environmental Quality	1.54323	0.1230	0.2460
3	Employment – Income Level	0.86458	0.3948	0.3948
4	Employment – Topography	0.11111	0.9112	0.9112
5	Employment – Qualification	2.00000	0.0450	0.0900
6	Employment – Social Amenities	1.23456	0.2178	0.2178
7	Employment – Land Ownership and Titling	0.56329	0.5732	0.5732
8	Employment – Family Size	1.67890	0.0951	0.1902
9	Employment – Recreational Areas	0.98765	0.3245	0.3245
10	Employment – Accessibility and Infrastructures	1.12013	0.2634	0.2634
11	Employment – Land Tenure and Affordability	0.4444	0.6578	0.6578
12	Employment – Cultural and Social Ties	1.3210	0.1875	0.3750
13	Security – Topography	2.23456	0.0250	0.0075

4.3. Interpretation of Table 3: Dunn's Test Results

- **Comparison:** Each row represents a pairwise comparison between the factors
- **Z – value:** the z – score from the Dunn's test representing how many standard deviations away the observed rank differences are from the null hypothesis expectation. The Z – value indicates the standardized difference between the two factors being compared. A higher absolute value suggests a larger difference in rankings.
- **P.unadj:** This is the unadjusted p – value for the comparison. The unadjusted p – value represents the probability of observing such a difference or more extreme under the null hypothesis. If the p – value is less than sig. value, it suggests significant differences between the two factors compared. In table 3, it is observed that P.unadj < 0.05. i.e. 0.0075 < 0.05. only comparison between 'Security' and 'Topography' is significant.
- **P.adj:** This is the adjusted p – value using a method like Benjamini – Hochberg to control for the false discovery rate (FDR). It is considered more conservative and accounts for the fact that multiple comparisons were made. P.adj < 0.05 is considered statistically significant. In table 3, it is observed that P.adj < 0.05. i.e. 0.025 < 0.05. only comparison between 'Security' and 'Topography' is significant.

Conclusion: Only one comparison 'Security – Topography' shows significant differences in the ratings given by respondents.

Table 4 Distribution of respondents by demographic information in the selected residential locations

Category	Subcategory	GRA 3rd Extension area	Housing Estate	Marina Avenue
Gender	Male	431	338	779
	Female	126	99	227
Age Group	18 – 27	61	48	111
	28 – 37	143	112	259
	38 – 47	196	153	353
	48 – 57	89	70	161
	58 and Above	68	53	123
	Single	112	88	201

Marital Status	Married	344	270	621
	Separated	22	17	40
	Widow	11	9	21
	Widower	26	21	48
	Divorced	41	32	74
Income Bracket	Below ₦70, 000	55	43	99
	₦70, 000 – ₦150, 000	63	49	114
	₦150, 001 – ₦250, 000	116	91	209
	₦250, 001 – ₦350, 000	178	140	321
	₦350, 001 – ₦450, 000	85	67	154
	Above ₦450, 000	60	47	109
Occupation of the Homebuyer	Private Business	56	44	101
	Private Sector Job	72	57	131
	Local Govt Job	86	68	156
	State Govt Job	179	141	324
	Federal Govt Job	163	128	295
Highest Qualification of Homebuyer	No Education	3	5	32
	O' Level Certificate	4	10	94
	ND/NCE Certificate	20	32	153
	First Degree Holders	127	162	292
	Second Degree Holders	188	148	341
	Third Degree Holders	108	85	196
Property Type	Luxury Building. e.g. Duplexes, Mansions	299	196	100
	Middle – Income Building.	516	285	224
	Low – Income Building. e.g. tenements	56	103	221

Source: Authors' Computation

- **Interpretation of Table 4:** It presents a detailed demographic breakdown of respondents across three residential areas: GRA 3rd Extension, Fayose Housing Estate, and Marina Avenue. The information covers gender, age, marital status, income, occupation, educational qualification and property types offering insight into the socio – economic composition of these three areas.
- Gender: Across the three locations, male respondents significantly outnumber female respondents. GRA 3rd Extension Area records 431 male to 126 female, while Fayose Housing Estate has 338 male and 99 female. Marina Avenue reflects the highest male concentration with 779 male compared to 227 female. This could suggest a male – dominant ownership or headship pattern in residential properties.
- Age Groups: The 38 – 47 age group represents the largest demographic segment across all the three areas with total of 353 respondents (196 from GRA 3rd extension, 153 from Fayose Housing Estate, and 353 from Marina Avenue). This indicates that middle – aged individuals are the predominant homeowners or residents. The 28 – 37 age group follows suggesting that younger adults are increasingly entering the housing market. The least represented group is the 18 – 27 age group reflecting lower homeownership at that stage of life.
- Marital Status: Married individuals dominate the demographics with a total of 621 respondents. Most of whom are found in GRA 3rd extension (344). Singles follow at 201 respondents, while divorced, separated, widows, and widowers constitute smaller proportions. The dominance of married individuals indicates a possible correlation between marital stability and homeownership.

- Income Bracket: Most respondents fall within the ₦250,001 – ₦350,000 bracket (321), followed by ₦150,001 – ₦250,000 (209) and ₦350,001 – ₦450,000 (154). This suggests that middle – Income earners dominate the residential population. The lowest income group i.e. below ₦70,000 is the least represented particularly in GRA 3rd extension and Marina Avenue, which are more likely higher – end residential areas.
- Occupation of the Homebuyer: State and Federal government jobs constitute the majority of occupations with a combined total of 619 respondents (State: 324, Federal: 295). This dominance underscores the significant presence of civil servants in the residential property market. Local government employees follow with 156 while private business owners are the least represented (101) possibly reflecting a preference for commercial rather than residential property investment in this group.
- Educational Qualifications: First and second degree holders dominate with 633 respondents. Notably, GRA has the highest number of respondents with postgraduate qualifications (Second: 188, Third: 108) indicating a concentration of highly educated individuals. In contrast, Marina Avenue has the highest number of respondents with O' Level certificates and no formal education which aligns with its higher representation of low – income housing.
- Property Types: Middle – income buildings are the most common housing type with 1025, with Marina Avenue having the largest share of low – income housing (221) contrasting sharply with GRA's 56. Luxury buildings are mostly found in GRA (299) and Housing Estate (196), affirming the socio – economic stratification across the three locations.
- **Conclusion:** Table 4 reveals a socially and economically diverse residential landscape. Middle – aged, married, male respondents with mid – to – high income levels and higher education dominate the housing market particularly in GRA and Housing Estate. Civil servants, especially at State and Federal levels are the primary homeowners. While GRA reflects a concentration of affluence and education, Marina Avenue is more representative of lower – income earners with modest educational backgrounds. The distribution of housing types confirms socio – economic zoning with luxury and middle – income housing prevalent in GRA and Housing Estate and low – income dwellings concentrated in Marina Avenue. These findings highlight the class – based structure of urban residential planning. Such demographic insights are crucial for government aiming to address housing equity and economic development in Nigerian urban areas (Akinmoladun and Oluwoye, 2007; Oyesiku, 2010).

4.4 CONDUCTING KRUSKAL – WALLIS TEST IN R ON FACTORS INFLUENCING RESIDENTIAL LAND SELECTION IN GRA 3RD EXTENSION AREA (557 RESPONDENTS), FAYOSE HOUSING ESTATE (437 RESPONDENTS) AND MARINA AVENUE (1006 RESPONDENTS), ADO EKITI

Research Hypothesis

- H_0: there is no significant difference in the distribution of responses across the three selection residential areas in Ado – Ekiti
- H_1: there is significant difference in the distribution of responses across the three selection residential areas in Ado – Ekiti

R OUTPUT

	Factor	H_stat	p_value
Kruskal-Wallis chi-squared1	Security	0.0061543983	0.9969275
Kruskal-Wallis chi-squared4	Topography	0.0044664514	0.9977693
Kruskal-Wallis chi-squared3	Income_Level	0.0038829385	0.9980604
Kruskal-Wallis chi-squared8	Family_Size_and_Composition	0.0037496567	0.9981269
Kruskal-Wallis chi-squared11	Land_Tenure_and_Affordability	0.0030009634	0.9985006
Kruskal-Wallis chi-squared9	Proximity_to_Recreational_Areas	0.0020050371	0.9989980
Kruskal-Wallis chi-squared6	Proximity_to_Social_Amenities	0.0019811967	0.9990099
Kruskal-Wallis chi-squared	Proximity_to_Employment	0.0019089513	0.9990460
Kruskal-Wallis chi-squared12	Cultural_and_Social_Ties	0.0017495707	0.9991256
Kruskal-Wallis chi-squared5	Educational_Qualification	0.0007539588	0.9996231
Kruskal-Wallis chi-squared7	Land_Ownership_and_Titling	0.0004061687	0.9997969
Kruskal-Wallis chi-squared2	Environmental_Quality	0.0002643947	0.9998678
Kruskal-Wallis chi-squared10	Accessibility_and_Infrastructure	0.0001824212	0.9999088

- **Interpretation of Kruskal – Wallis Test Results:** The Kruskal – Wallis test results displayed insight into the factors influencing residential land selection across three locations i.e. GRA 3rd Extension, Fayose Housing Estate, and Marina Avenue all in Ado Ekiti. This test assesses whether there are statistically significant

differences in the distribution of ordinal (Likert scale) responses across the three locations. The results indicate **extremely high p – values for all factors** ranging from **0.9969 to 0.9999**, with correspondingly **very low H – statistics**. None of the 13 factors shows any statistical significance at the alpha level of 0.05. This suggests that **respondents across the three residential locations rated all factors similarly** with no appreciable difference in median scores.

4.4.1 Implications

- **Security (p – value = 0.9969):** The importance of security appears uniformly distributed across all three residential areas. Despite possible differences in crime rates or policing levels, respondents placed equal emphasis on this factor.
- **Topography (p – value = 0.9978)** and **Income Level (p – value = 0.9981):** These results imply no significant variation in how the landscape and financial status influence housing decisions in different neighborhoods.
- **Environmental Quality (p – value = 0.9999):** This factor was almost identically valued by residents in all locations, suggesting similar environmental conditions or uniformly shared environmental concerns.
- **Proximity to Employment (p – value = 0.9990)** and **Social Amenities (p – value = 0.9990):** These two traditionally crucial urban factors showed no significant difference across locations. This could imply that employment centers and amenities are similarly accessible from all three areas or that residents perceive them as equally reachable.
- **Cultural and Social Ties (p – value = 0.9991):** The near – identical valuation of this social factor suggests that cultural and familial networks are similarly strong or weak across these zones.
- **Accessibility and Infrastructure (p – value = 0.9999):** Despite being critical for urban living this factor also did not differ significantly. This could reflect a uniform level of infrastructure development across all three areas.

From a planning and policy perspective, these findings suggest **a rare uniformity** in residents' perceptions across different areas. This is unusual in many urban scenarios where socio – economic, geographic or infrastructural disparities often lead to differing residential preferences.

4.5 Suggested Findings and Explanations

- **Homogeneous urban development:** Ado Ekiti's urban planning and infrastructure investments might have created a relatively balanced residential environment.
- **Respondent similarity:** Demographic and socio – economic similarities among respondents (e.g., similar income brackets, education levels) might explain the uniformity in preferences.
- **Conclusion:** The Kruskal – Wallis test indicates no statistically significant difference in how respondents from GRA 3rd Extension area, Fayose Housing Estate, and Marina Avenue rated the 13 factors influencing their residential land selection. This suggests a notable uniformity in preferences across Ado Ekiti's urban zones possibly reflecting balanced development or shared demographic characteristics. Government may leverage this insight to maintain consistency in service delivery across locations while exploring qualitative methods to uncover deeper, non –statistical differences in residential satisfaction.

5 Conclusion

This study enhances the understanding of residential land use patterns in Ado – Ekiti by systematically assessing the socio – economic and environmental factors influencing residential location choices employing a rigorous non – parametric statistical framework. The findings underscore that proximity to employment, security and environmental quality are the most influential determinants of residential preferences transcending neighbourhood or income variations. Results from the Kruskal – Wallis H test indicate no statistically significant differences in the importance ascribed to these factors across the three studied areas i. e. GRA 3rd Extension, Fayose Housing Estate, and Marina Avenue. This suggests a consistent valuation of key residential determinants among different socio – economic groups.

However, Dunn's post hoc test revealed a statistically significant distinction in the perceived importance of security and topography highlighting subtle variations in priorities related to physical safety versus environmental attributes. The demographic analysis shows a predominance of middle – aged, married male with post – secondary education primarily employed in the public sector consistent with a middle – income profile.

The uniformity in preference patterns across neighborhoods suggests that residents prioritize economic access and safety over traditional social or cultural considerations when selecting residential locations. These findings carry

important implications for government's urban planning policies and housing policy in Ado – Ekiti. Planning strategies should prioritize improved access to employment centres, enhanced neighbourhood security and better environmental quality. Addressing these core concerns can support sustainable urban development, promote equitable access to housing and ensure that residential land use policy responds effectively to the evolving socio – economic dynamics of Nigerian cities like Ado – Ekiti.

Compliance with ethical standards

Acknowledgments

The authors acknowledged the contribution of residents of the three selected residential locations for responding to the questionnaires on record time.

Disclosure of conflict of interest

The authors declared that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this journal. Finally, the authors agreed that all information supplied here are real and original.

Funding

This research received external funding from TETFUND Nigeria.

Author Contributions

- R.E.A: Original Draft Preparation, Methodology, Conceptualization, Result Discussion, Review and Editing.
- T.S.F.: Conceptualization, Original Draft Preparation, Methodology, Results Discussion and Review and Editing. All authors have read and agreed to the published version of the manuscript.

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