

The Spatial Nature of Retail Property: Evidence from Minna, Nigeria

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This study examines the nature of retail property by providing empirical evidence from Minna, Nigeria. Spatial data on 278 retail establishments transcending the major roads in the inner-city neighbourhoods of the study area, socio-demography of their respective occupiers and the nature of retail services provided were collected by employing a mobile data collection software known as kobotool. This data allowed an overview of the composition of these retail spaces to be presented and compared across space. The analyses were conducted using GIS technologies, cross-tabulation, nearest neighbour analysis and descriptive analysis. A major finding from this study is the actuality of spatial differentiation in the distribution of the retail shops, with more retail establishments spatially clustered in the northern part of the study area. In view of this clustering tendency in the retail shops distribution, the study recommends that efforts on future urban planning and development as well as public policy should be directed towards the south part of the study area, so as promote balanced development of urban retail space in the study.

Keywords: Nearest neighbour analysis, Retail property, Retail space, Spatial distribution, Minna

Introduction

The fundamental questions which this research examine are: how are commercial retail properties distributed based on the nature of retailing activities in Minna? Do retail properties exhibit cluster tendency across space? In retail geography literature, the concept of retailing is nebulous, but is synonymous to retail spaces operating through a spectrum of markets like shopping centres, department stores, corner shops, malls and main streets where commodities are bought and sold (Bridge & Dowling, 2001; Farrag, El Sayed & Belk, 2010; Marsden & Wrigley, 1996; Wrigley & Lowe, 1996). Retailing has however been conceptualised as a *market place* or a point of contact where disparate people meet in order to carry out their local way of life and by extension, represents practical place of trading for consumers as well as businesses (Alhuwalia, 2003; Jeong & Kim, 2012). Its importance in this modern complex

commercial world is therefore not in doubt, as it houses the economic base of most urbanised cities, confers sense of place identity and mould the spatial economic development of most urban centres of the world.

Aside anecdotal evidence, the rising trends in retail globalisation, real estate bubbles, and urban renaissance in most cities all over the globe have triggered both academic and public policy considerations on retail markets (Gonzalez & Waley, 2013). Against this backdrop, vast majority of research on retailing have focussed on its role as medium for providing peoples' material needs (Bridge and Dowling, 2001), social inclusion and networking (Watson 2009; Zukin, 1995; Zukin, Trujillo, Frase, Jackson, Recuber & Walker, 2009), mobility and a cosmopolitan civic environment (Anderson 2004; Morales, 2011). However, at a micro scale, little

attention has been received on the spatial form and use of retail markets (for elaborate details see, Blomley, 1996; Goodchild, 2000).

Generally, retail spaces are locally embedded, geographically variable and a reflection of their use (Bridge & Dowling, 2001). According to theoretical discussions in Christaller's Central Place Theory, though central places exist for the provision of goods and service for peoples' consumption within and outside the city boundaries, there is a trade area known as the threshold which encompasses the area, which assures the viability of the good and services in question. This implies that locally distinctive array of retail properties is bound to exist across geographical space (Bridge & Dowling, 2001) since particular mix of shops in a local area can reinforce a distinct geographical retail identity that then attracts further similar forms of investment (Crewe & Lowe, 1995). Though considerable progress has been made using spatial data to provide deeper insights, explanations and real representations in retail planning (Hernandez, 1999; Hernandez & Biasotto, 2001), spatiality being a crucial part of interest in the retail markets is often neglected (Pottie-Sherman, 2011).

Against the foregoing, the focal point of this research is to examine the composition of Minna retail market in space and the pattern which such market exhibit. Given the peculiar nature of retail property, evidence of such market spatiality would provide public authorities, retail investors, retailers and other market participants a clear understanding of the nature and operation of the retail markets and services in emerging economies of the world such as Nigeria.

The Data for the Study

The data for this study pertains to the commercial property market in Minna, the capital of Niger State of Nigeria. The retail property market which is a segment of Minna commercial property market represents the basis of analysis. The study employs three primary datasets: spatial data

of the retail shops, the socio-demographic data of the occupiers of the retail and their nature of retail activities in the study area. Specifically, only 278 retail establishments - owned and rented - which are geographically located along the major roads transcending the inner parts of Minna were considered as sample. Most of these retail shops are location specific, easily accessed along the major roads and are found clustered together mainly in the inner-city neighbourhoods of Minna. Based on physical survey, the geographical neighbourhoods or physical areas where these retail shop properties are predominantly situated include: Sabon-gari, Nasarawa, Minna central, Limawa, Tudunwada-North, Tudunwada-South and Tunga neighbourhoods. In passing, the retail outlets are situated along nine (9) major roads comprising Mobile-Bosso road, Hospital road, Airport road, Ketenrengwari road, Sabongari, Kuta road, Tunga, Western-by-pass and Broadcasting road. We elicit information from the occupiers (owners and tenants) of these retail outlets who carry out their respective trade in these core areas of the city.

Aside data on socio-demographic characteristics of these retailers, information on the nature of retail business and trade embarked upon by the retailers in their respective retail shops were also collected. Data on property attributes of these retail shops, such as the location and measurements (in terms of X and Y coordinates) were also collected in the study area. As our study require spatial mapping of point location of the retail shops, satellite imagery was sourced and used as base map for the geographic neighbourhoods in the study. The descriptive summary statistics of the sample data (reported in simple frequency and percentage) employed for further analyses in this study is presented in Table 1.

The analysis of responses in Table 1 showed that a large proportion of the respondents (retailers) were between 21-25 years (30.9%) and 36-40 years (38.1%) of age respectively. Perhaps this implies that

majority of the respondents embark on retail business and activities at a tender age. In addition, 14.4% of the respondents were between 41 and 45 years of age, 11.2% were 46 years and above, while only a small proportion of the respondents representing 4.7% were between 16 and 20 years old. On gender basis, 79.1% of the respondents in the sample data were male and 21.1% were female. This gender disparity can be explained by the socio-cultural and religious background of the study area which frown at women engaging in any form of retail and business activities. The distribution of respondents by marital status indicated that 62.9% were married and 37.1% were still single. A further examination by cross-tabulating marital status with gender showed that, out of the 62.9% of the respondents who were married, 14% were female while 48.9% were male. On the other hand, of the 37.1% of the respondents who were single, 6.8% and 30.2% were female and male respectively.

Analysis of the responses on geo-political zone showed that 39.9% of the respondents were from south-east geo-political zone – of Igbo extraction, while 35.3% were from the north-central states. This is not surprising as people from south-east region of the country are highly noted for their business pursuit irrespective of the geographical location. Whereas, 10.1% and 8.6% of the respondents were from south-west and north-west states of the country respectively. However, only small proportion of the respondents, representing 4% and 1.1% respectively were from south-south and north-east part of Nigeria.

Furthermore, the analysis of responses on nature of business as shown in Table 2 depicts that 12.9% of respondents engaged in Grocery and restaurant as well as Computer and electronic respectively, while 19.4% of the respondents were into Boutique. In addition, while 16.2% of the respondents were into Building materials and household items, only 5% engaged in Book and office supplies. 9.4% of the respondents were involved in Automobile sales, servicing and repairs while 3.6% were

into Pharmaceuticals. Also 6.1 % of the respondents' trade in Phone and ICT products while 7.6% were into Photography and recording. Lastly, 2.2% of the respondents provided specialized services, while 4.7% were into Tailoring.

Methodology

Data Collection

The data employed for the research was collected between 29th July and 2nd August, 2017 in Minna using a survey-based questionnaire. The data collection proceeds in two stages. First, a reconnaissance and enumeration survey of all inner-city locations where retail shops exist in clusters along major roads, and their geographical extent were identified. This survey yielded 278 retail shops along nine major roads across the study area.

To facilitate the questionnaire distribution, numbering of each of the cases (retail shops) by field assistants in each of the nine major roads (study locations) using a unique numbering system was carried out. This involved numbering retail shop properties on the right-side of any particular road in any study location, starting with the 1st case numbered 100, the 2nd numbered 101, and the 3rd numbered 102 and so on. Those retail shop properties on the left-hand side were also numbered in similar manner but starting from 200.

The second stage involved the distribution questionnaire to the respondents (the retail shop occupiers) in the study area. For the questionnaire distribution, we employed a mobile data collection software known as *Kobotool*. We downloaded from Google play store and installed the software on our field assistants' mobile android phones after the retail shop enumeration survey. We then asked them to retrieve the questionnaire for the study, which we had earlier created on the kobo tool website (kobotoolbox.com), using this software. After retrieval, the created questionnaire was then administered to the respondents by the field assistants, who then fill and store same on their mobile android phones. Aside using kobotool for creating and retrieving information through

the questionnaire from the 278 respondents, it was also employed concurrently to capture the GPS coordinates of their 278 retail shop properties for subsequent analysis of responses and mapping.

After all the questionnaire have been duly administered, the aggregated information (respondents' responses) collected and stored on the mobile devices, were sent by our field assistants to a central server (kobotoolbox.com) using internet connectivity. The raw data collected and sent by the field assistants to the cloud were

subsequently downloaded from the website in *xls* form in an excel spreadsheet onto our computer for analysis. This procedure aside providing us with real-time responses, also guarantees the quality and robustness of the dataset employed in this study. As such we can be certain that any oddity in the data would not impinge on any meaningful inferences which can be inferred in this research.

Table 1: Descriptive Summary of the Sample Data

	Frequency	Percent (%)
Age of Respondent		
16-20 years	13	4.7
21-25 years	86	30.9
36-40 years	106	38.1
41-45 years	40	14.4
46 years and above	31	11.2
No response	2	0.7
Gender		
Women	58	20.9
Men	220	79.1
Marital Status		
Single	103	37.1
Married	175	62.9
Geo-political zone		
South-east	111	39.9
South-south	11	4
South-west	28	10.1
North-east	3	1.1
North-central	98	35.3
North-west	24	8.6
No response	3	1.1
Religion Inclination		
Islam	91	32.7
Christianity	187	67.3
Length of stay in shop		
3 years and below	77	27.7
4-6years	88	31.7
7-9years	38	13.7
10years and above	74	26.6
No response	1	0.4

Table 2: Nature of Business of the Respondents

Nature of Business	Frequency	Percent	Nature of Business	Frequency	Percent
Automobile	26	9.4	Pharmaceutical	10	3.6
Bookshop and office supplies	14	5	Phone and ICT	17	6.1
Boutique and salon	54	19.4	Printing and photography	21	7.6
Building and household items	45	16.2	Specialized services	6	2.2

Data Analysis

Aside using simple frequency, percentage and crosstab to analyze the responses of the respondents, the mapping and spatial analysis of the retail shops in the study area generally requires a base map for the geographic areas in the study. A boundary map which served as the base map was therefore generated from satellite imagery. The latitude and longitude coordinates of the retail shops obtained using the GPS (Global Positioning System) device of the mobile android phones were imported from the spreadsheet in to QGIS software environment where the map has been laid. With this, we imported the retail shop properties coordinates from our spreadsheet so that point locations of the retail properties along the major roads in the inner-city neighbourhoods were generated with the QGIS program on the base map. In addition, attribute of the retail shops such as the nature of business and retail activities were imported from the spreadsheet and generated on the base map.

Using the coordinates of the retail shops, Nearest Neighbor Analysis (NNA) was employed to examine the spatial nature of the retail shop pattern in the study area, on the basis of whether the retail shops exhibit clustered, random or regular pattern. When NNR equals 0, the distribution and spatial pattern of the retail shop is clustered; if NNR equals 1, the spatial pattern of the retail shop is random and when NNR is equal 2.15, the distribution and spatial

pattern of the retail shop is regular. The conventional statistical test for NNA pattern is to calculate a Z-score for the distribution and then compared it with its tabulated value, so as to determine the level of significance of the retail shop pattern. The results of our analysis are discussed in the subsequent section of this research.

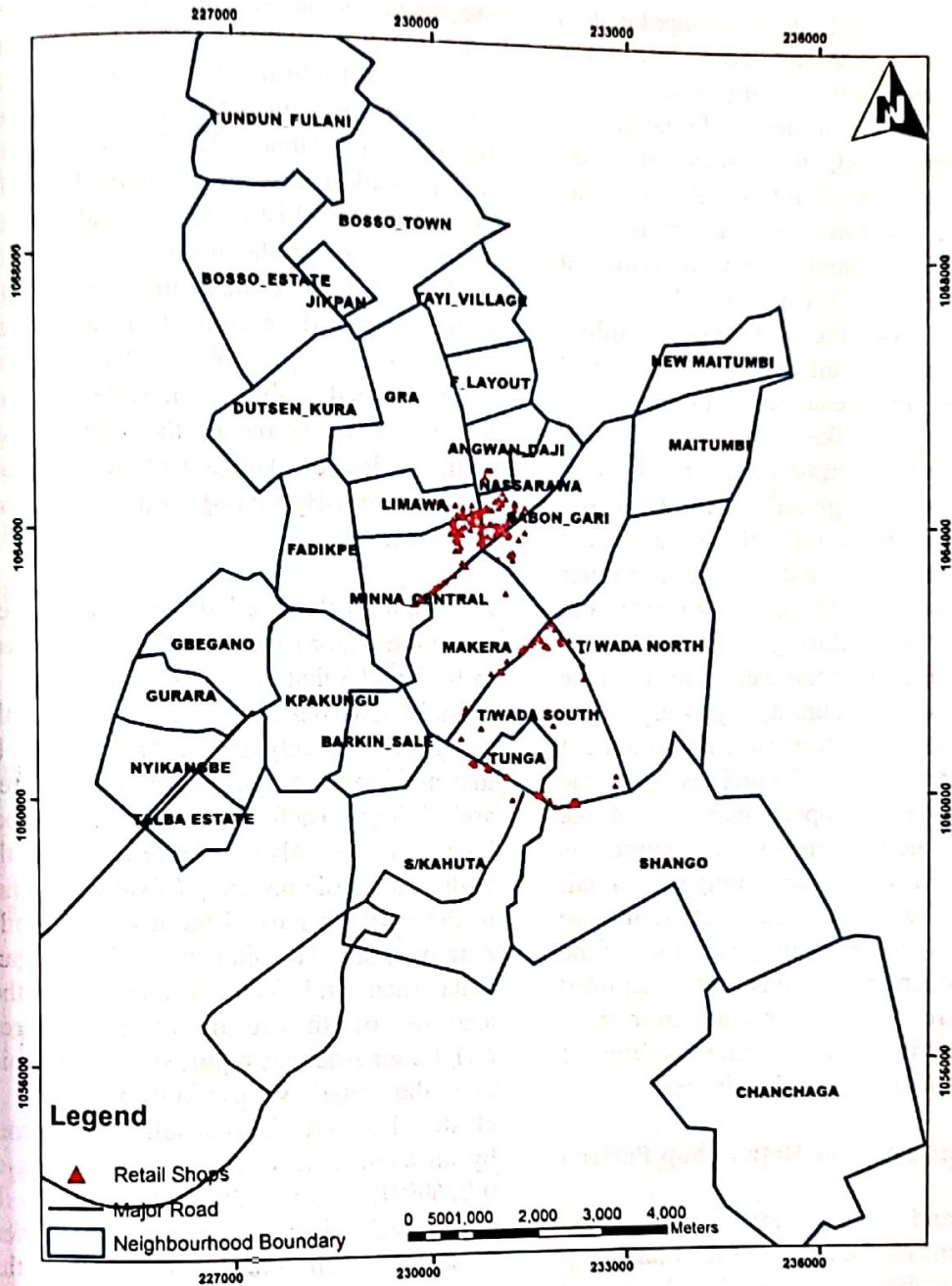
Results and Discussion

Spatial Distribution of Retail Shop by Nature of Retail Activities.

Before examining the spatial distribution of the retail shops by nature of retail activities, table 3 presents the geographical composition of the 278 commercial retail properties in the study area. Apparently, Mobile road has the highest proportion (23.7%) of retail shops along all the major routes in the study area, followed by Sabon gari with a retail proportion of 19.4%. Kuta road and Western-Bye pass both have 10.8% and 9.4% of the retail shops in the study area respectively. 8.6% of the shops are situated along Broadcasting road and 7.9% on Keterengwari road. 7.6% of the retail outlets are along Tunga road while Airport road housed the least proportion (5.0%) of retail shop out of all the nine major roads in the inner-part of the city that constitute the study area. The distribution of these retail shops along the major routes in the inner-city neighbourhoods of the study area can be visualized in fig 1.

Table 3: Geographical Composition of the Retail Shops

Inner-City Neighbourhoods	Roads Locations	(Study	No. of Shops	Percentage of Shops
Minna Central	Mobile		66	23.7
Minna Central	Hospital Road		21	7.6
Minna Central & Limawa	Airport Road		14	5.0
Minna Central	Keterengwari		22	7.9
Sabon-gari	Sabon gari		54	19.4
Sabon-gari & Nasarawa	Kuta Road		30	10.8
Tunga, Tuduwada North & South	Tunga		21	7.6
Tunga and Tuduwada South	Western- Bypass		26	9.4
Tunga and Tuduwada South	Broadcasting Road		24	8.6
	TOTAL		278	100



Further examination of the cross-tabulation of retail shops across all study locations with their nature of retailing activities is shown in Table 4. As evident in the last row of Table 4, it can be seen that boutique and salon, building material and furniture, computer and electronic and automobile respectively, were the four (4) most predominant retail activities in all locations across the study area. On the other hand, gift, art and graphics, kitchen and household, shoe and sporting as well as specialized services (travel, driving and

estate agency) were least frequent retailing business found in the study area.

At a disaggregated level, it can also be observed that printing and photography as well as restaurant, grocery and supermarket were more predominant around Mobile road. This is true given the fact that most printing companies and grocery stores are found in clusters around Mobile road. At hospital road, the most commonly found retail business were boutique and salon, computer and electronics, stationeries and printing and photography. Along Airport

road, boutique and salon, computer and electronics and phone and accessories were frequently seen as the retail business which were engaged in by traders and retailers. At Keterengwari road, the nature of retail business ranges from automobile, boutique and salon, computer and electronics to tailoring. Most common retail activities at Sabon gari and Western-By-Pass were automobile, boutique and salon, building material and furniture, computer and electronics and restaurant, grocery and supermarket. Unlike Sabon gari and Western-By-Pass, most retail shops along Tunga did not engage only in Boutique and salon. Along Kuta road the predominant retail activities were automobile, computer and electronics, restaurant, grocery and supermarket and tailoring. Most retail shops along broadcasting road were into boutique and salon, restaurant, grocery and supermarket and stationeries. An important implication of this finding is that the commercial retail property market in Minna is highly heterogeneous in nature as characterized by diverse range of retail activities. The spatial concentration of these shops based on the retailing activities of the retail occupiers in the study area is depicted in fig 2. This visual impression from fig 2 further reinforced the earlier finding of varied retail business and activities.

Spatial Nature of the Retail Shop Pattern in Minna

Fig 2 and 3 provide clear visual explanations on the nature of the retail shop pattern examined in this study. The spatial dimension and pattern of these retail shops manifest in several ways: First, spatial differentiation exists in the retail shops in the study area. For example, in Fig 2 and 3 respectively, a north/south divide emerges in the study area, with retail shops more spatially concentrated in the northern part of the study area (comprising Mobile road, Airport road, Hospital road, Sabon gari, Kuta road and Keterengwari) than the southern part (Tunga, Broadcasting road and Western-Bye-Pass). This divide is not

surprising as the northern part of the study area which housed the original settlements in Minna, is traditionally known as the focus of activity in terms of retail shopping and business in Minna. Besides, this spatial differentiation can be explained by the deeply rooted historical antecedents and social factors in the northern part of the study area. For example, until recently the initial pace of development of the northern part (comprising Mobile, Airport road, Hospital road, Sabon gari, Kuta road and Keterengwari) surpasses the southern part of the study area (Tunga, Broadcasting road and Western-Bye-Pass) which are fairly new areas.

Although all the retail shops sampled were along the major routes, it is obvious as seen in fig 2 and 3 that there is some evidence of spatial clustering of the retail shops in the study area. A likely reason for this might be that most retail shops on a particular street are abutting each other the next street. Lastly, it can also be inferred that the highest level of clustering (if any) happened in the northern part of the divide (Mobile, Airport road, Hospital road, Sabon gari, Kuta road and Keterengwari). Further analysis of the result of the Nearest Neighbour Analysis reported in fig 4 depict that the retail shops indeed exhibit a clustered pattern. This result is confirmed by an average nearest neighbour index of 0.026995 (Z -score = -30.87, $p = < 0.01$). In other words, given a z -score of -30.87, there is a less than 1% likelihood that this clustered pattern occurred by random chance. This analysis showed that the observed spatial distribution of the retail outlets as shown in fig 2 and 3 is significantly different from random and therefore exhibits clustered tendencies. Economic agglomeration benefits are more likely to contribute to such observed clustering of the retail shops in the study area (Ball, Lizieri & MacGregor, 1998; Eberts & McMillien, 1999).

Table 4: Cross-Tabulation of Nature of Retail Activities and Location

Location	R A	RA 2	R A	R A	R A	R A	R A	R A	R A	R A	R A	R A	R A	RA 14	TOT AL
	1		3	4	5	6	7	8	9	10	11	12	13		
Mobil	Count	1	11	2	10	2	2	2	5	14	9	3	1	2	66
	% within Location	1.5	16.7	3.0	15.2	3.0	3.0	3.0	7.7	21.2	13.6	4.5	1.5	3.0	100.0
Hospital Road	Count	0	6	0	3	2	0	1	0	5	0	0	0	3	21
	% within Location	0.0	28.6	0.0	14.3	9.5	0.0	4.8	0.0	23.8	0.0	0.0	0.0	14.3	100.0
Old Airport Road	Count	0	2	0	7	0	0	0	2	0	1	0	0	1	14
	% within Location	0.0	14.3	0.0	50.0	0.0	0.0	0.0	14.3	0.0	7.1	0.0	0.0	7.1	100.0
Keterengwari	Count	7	2	1	3	0	0	1	0	0	5	0	0	3	22
	% within Location	31.8	9.1	4.5	13.6	0.0	0.0	4.5	0.0	0.0	22.7	0.0	0.0	13.6	100.0
Sabonngari	Count	8	7	7	6	0	2	3	3	1	11	1	1	2	54
	% within Location	14.8	13.0	13.0	11.1	0.0	3.7	5.6	5.6	1.9	20.4	1.9	1.9	3.7	100.0
Kuta Road	Count	5	2	7	2	0	0	1	2	0	3	1	2	3	30
	% within Location	16.7	6.7	23.3	6.7	0.0	0.0	3.3	6.7	0.0	10.0	3.3	6.7	10.0	100.0
Tunga	Count	1	5	3	3	0	1	1	2	1	2	1	0	1	21
	% within Location	4.8	23.8	14.3	14.3	0.0	4.8	4.8	9.5	4.8	9.5	4.8	0.0	4.8	100.0
Broad casting Road	Count	2	3	10	1	0	2	0	1	0	2	0	2	3	26
	% within Location	7.7	11.5	38.5	3.8	0.0	7.7	0.0	3.8	0.0	7.7	0.0	7.7	11.5	100.0
Western-Bye-Pass	Count	2	6	7	1	0	1	1	2	0	3	0	0	0	24
	% within Location	8.3	25.0	29.2	4.2	0.0	4.2	4.2	8.3	0.0	12.5	0.0	0.0	0.0	100.0
All Locations	Count	26	44	37	36	4	8	10	17	21	36	6	6	14	278
	% within Location	9.4	15.8	13.3	12.9	1.4	2.9	3.6	6.1	7.6	12.9	2.2	2.2	5.0	100.0

*RA1= Automobile & accessories, RA2= Boutique & salon, RA3= Building material & furniture, RA4=Computer & electronics, RA5= Gift, art & graphics. RA6=Kitchen and household, RA7=Pharmacy, RA8=Phone & accessories, RA9=Printing & photography, RA10=Restaurant, grocery & supermarket, RA11=Shoe & sporting, RA12=Specialised services (travel, estate, driving agency), RA13= Stationeries, RA14= Tailoring.

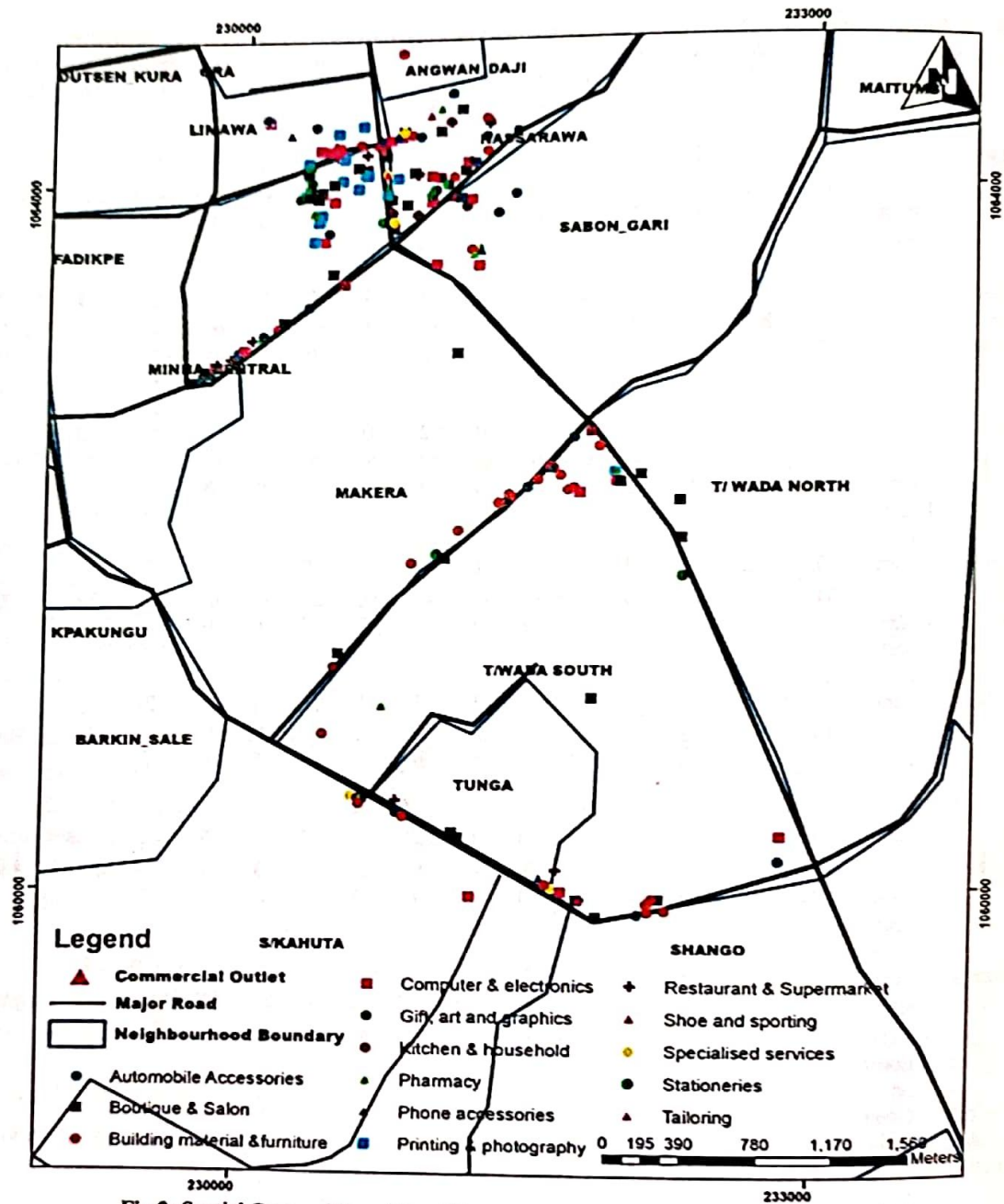


Fig 2: Spatial Composition of Retail Property based on Nature of Retail Activities

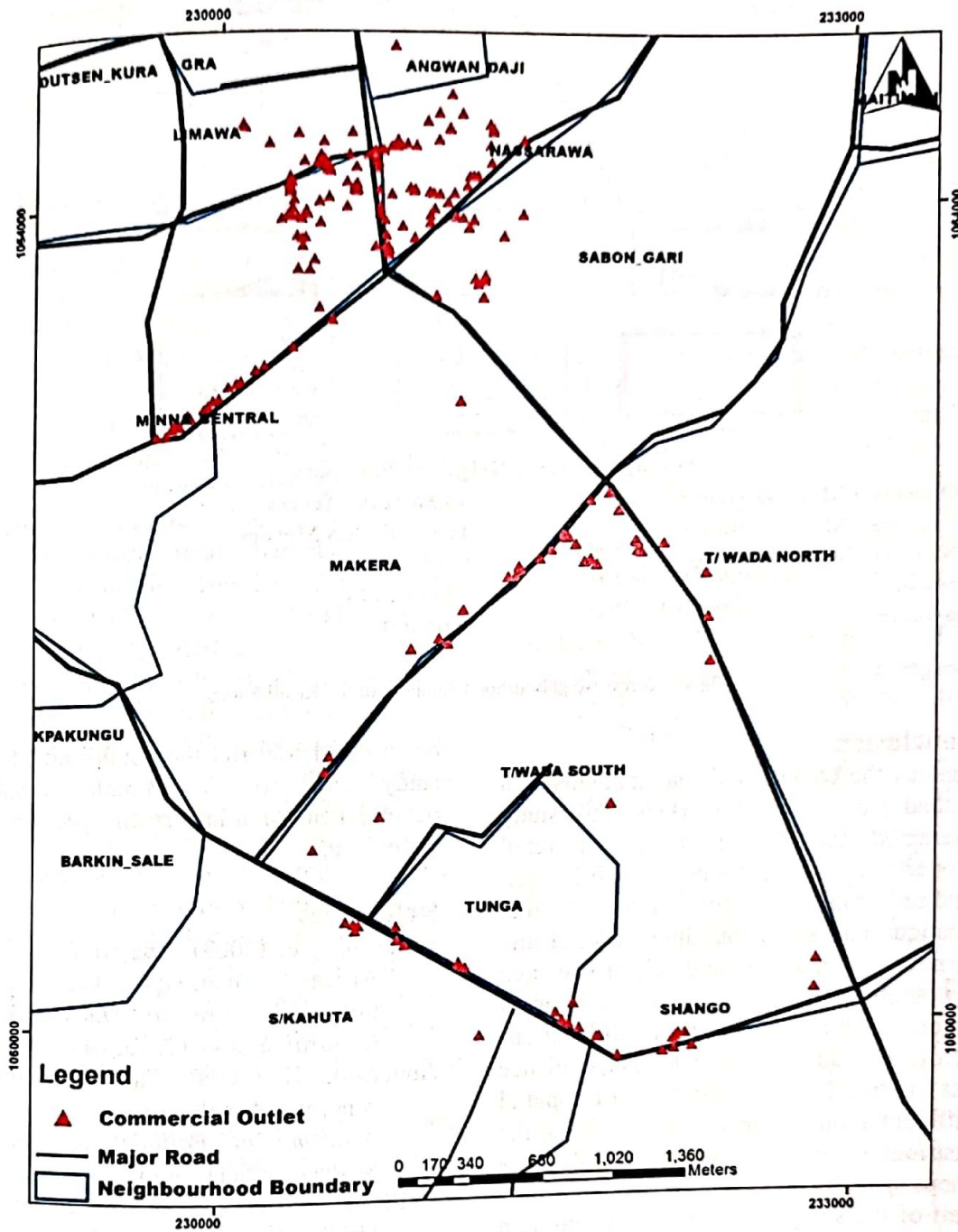
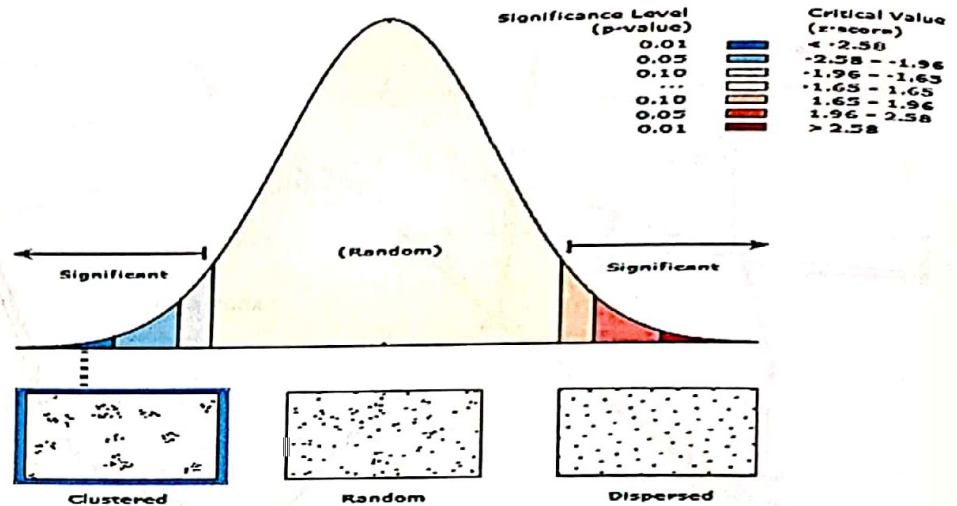


Fig 3: Quadrangle showing the Spatial Distribution of Retail Properties in Minna



Average Nearest Neighbor Summary

Observed Mean Distance:	33.550142 Meters
Expected Mean Distance:	1242.839725 Meters
Nearest Neighbor Ratio:	0.026995
z-score:	-30.868279
p-value:	0.000000

Fig 4: Nearest Neighbourhood Analysis of the Retail Shops

Conclusion

Against the background that spatiality is a crucial part of retail markets, this study examined the spatial nature of retail property in Minna, Nigeria. An important finding from our study indicates that boutique and salon, building material and furniture, Computer and electronic and Automobile were the four (4) most predominant retail activities in all locations across the study area. Beyond that, evidence has evinced the existence of spatial differentiation (a north/south divide) in the distribution of the retail shops, with more shops spatially concentrated in the northern part of the study area than in the southern part of the study area. There is also some evidence of spatial clustering of the retail shops with the highest level of clustering happened in the northern part of the divide (Mobile, Airport road, Hospital road, Sabon gari, Kuta road and Keterengwari). Further analysis using Nearest Neighbour Analysis confirmed this clustering tendency. Given the spatial differentiation, in terms of the north/south divide in the retail shops distribution, the study recommends that efforts on future urban planning and development as well as public policy should

be directed towards the south part of the study area so as promote balanced development of urban retail space in the study area.

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