



# GEOSPATIAL ANALYSIS OF HOTELS IN KADUNA METROPOLIS, KADUNA STATE, NIGERIA

## ABSTRACT

The development of the tourism industry in any city around the world is hinged on the success of the hospitality industry of that particular country. This research analyzed the spatial distribution of hotels in Kaduna metropolis. The data used are Satellite Imagery and Administrative map from Kaduna State Geographic Information Service

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## Introduction

Hotel is an institution or building in which are provided lodgings, meals and other services for the travelers. It can be said to be a business enterprise having a building for public accommodation and furnishes lodging and usually provides meals, beverages and personal services. A hotel is home away from home. It is the place where the tourist stops being the traveler and becomes the guest. Mohanty (2008). To a greater or less extent, the facilities of the hotel may also affect the local population but the primary function of a hotel is to accommodate those away from home and supply them with their basic needs and try to meet their expectations (Oxford Economics, 2010).

The basic function of a hotel that makes it quite distinct from other types of businesses to which its functions are supplementary. It is not very easy to



(KADGIS), geographic coordinates of hotels from the field using Promark 3 Global Positioning System (GPS) Receiver while hotels facilities and types of services offered were collected from Kaduna State Ministry of Culture and Tourism. The findings of the study show One hundred and ninety (190) hotels were identified with 23.1% of the hotels located in Kawo/Mando area, closely follow by Barnawa/Narayi with 22.1% while the areas with fewer number of hotels in the metropolis are Gonin-Gora/Ungwan Romi and Kurmin Mashu with 7.4% and 5.3% respectively. The results further reveals that 39.5% of the hotels in the metropolis fall within the category of one (1) star hotel, while 15.8% were in the category of two (2) star hotel and 9.5% of the hotels in the metropolis were in the three (3) star category. It is worthy of note that the result reveals that about 32.2% of the hotels in the metropolis fall below the category of one (1) star hotel which is indeed worrisome. The result of the distribution pattern reveals clustering in the pattern of distribution of hotels in Kaduna metropolis with the nearest neighbour index of 0.484211 and z-score of -21.85611. The study, therefore recommends that government should invest in infrastructures, because it has a direct impact on the hospitality industry and it is also pertinent that hoteliers in the metropolis should upgrade their services to meet the international standards.

**Keywords:** Clustering, Geospatial, Hotels, Pattern, Star

draw a line between a hotel and a lodging house, a motel, a guest house, or similar establishments (Mohanty, 2008). The main characteristics which set a hotel apart from other types of accommodations center on the extent or completeness of facilities and services available. Hotel has a wide range of business activities which can be grouped into these four functions: providing living accommodation; supplying food, drinks for immediate consumption, having transportation, recreational and entertainment facilities; as well as any other function (Mohanty, 2008).



Hotels rely heavily on effective location strategy to succeed in the competition to attract guests to rent their rooms. An appropriate location is of paramount importance as it will be difficult and extremely costly for hotels to relocate and reconfigure their services (Urtasun and Guitierrez, 2006). Nicolai (2006) opined that a strategic location will undoubtedly augur well for superior performance in terms of revenue generation. Empirical works such as that of Newell and Seabrook (2006) evaluated the decision-making process of hotel investment and identified location as a key factor.

As a service industry, hotels are keen on locations that are accessible to their potential market because they seek for increased demand from potential guests. Barros (2005) argued that potential guests (who are often tourists or business people) prefer a location where services are available. Hotels in urban areas are usually highly clustered, because agglomeration results in hotels enjoying benefits from clustering. Generally, one incentive for choosing to locate close to other hotels is to gain a significant positive influence in hotel efficiency (Urtasun and Guitierrez, 2006). Globally, hotels can be classified based on different criteria. They may be classified based on the amenities, location, size of property and kind of service they render. The length of stay of customers, theme, as well as the target market may also be used as a basis for classification (Omogunloye and Ayeni, 2012). The rating of hotels using stars based on services provided is the most common type of hotel classification. Higher number of stars indicates more luxury. Hospitality and service are two of the most distinguishing characteristics of any hotel in any star category. In the interest of both guests and the hotel industry, these elements have to be up to the required standard. It is important that guests receive a level of hospitality and the service that they (within reasonable limits) are entitled to expect in hotels of the star category concerned. This involves aspects like reception, treatment, and attitude of staff. It is obvious that the expectations of guests will rise as the number of stars of a particular hotel rises.

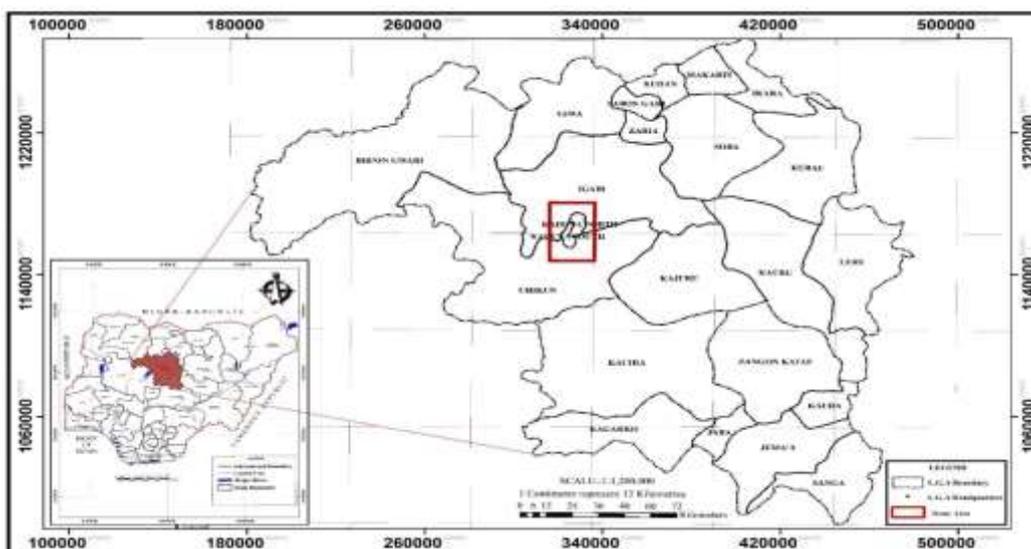
In Nigeria, the contemporary infrastructure situation has put tremendous strain on the various economic resources that are available for industries and more so, on the hospitality business (Bello and Bello,



2012). The increased competition for the available infrastructures in the hospitality industry in Nigeria is heightened by the deteriorating economy. It is pertinent to affirm that Nigeria is facing challenges in improving their infrastructure and municipal service delivery. This is because infrastructure development has direct bearing on the sustenance of the hospitality industry (Bello and Bello, 2012). Kaduna metropolis is known to be the former capital of the northern region and a home to industrial, economic and administrative functions. This is largely responsible for the concentration of hotels in the area and has therefore, given birth to the need to analyze the spatial distribution of hotels in the area.

### **STUDY AREA**

The Kaduna metropolis is the economic and financial capital hub of Kaduna state; the metropolis is made up of four (4) Local Government Areas - all in Kaduna State. Kaduna Metropolis is located between latitude  $10^{\circ} 28' 00''$  and  $10^{\circ} 37' 00''$  North of the Equator and longitude  $7^{\circ} 19' 00''$  and  $7^{\circ} 31' 00''$  East of the Greenwich Meridian. The metropolis is made up of the Kaduna North, Kaduna South and other adjoining Local Government Areas that makes up the entire metropolis are Igabi and Chikun Local Government Areas (see Figure 1 and 2).



**Figure 1: Nigeria showing Kaduna State**

**Source: Kaduna Polytechnic Cartographic Map Library (2022)**



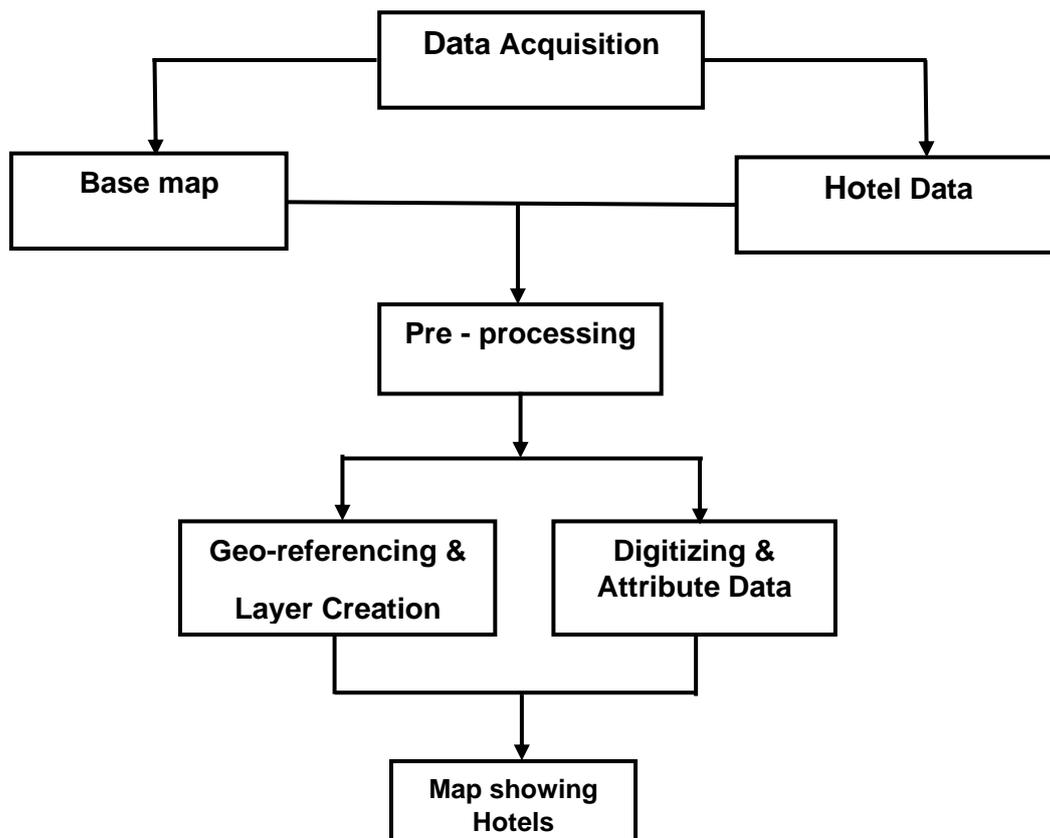


**Table 1: Data Types and Sources**

Data Used	Source	Purpose
Satellite Imagery (High Resolution)	Kaduna State Geographic Information Service (KADGIS)	Base map for overlay operations
Administrative Map of Jalingo (Scale:-1:400,000)	Kaduna State Geographic Information Service (KADGIS)	Base map for overlay operations
Coordinates of Hotels	Promark 3 GPS Receiver	Identification of Hotels
Hotels Facilities and types of Services	Kaduna State Ministry of Culture and Tourism	Classification and Distribution of Hotels
Literature materials	Published Journals and Articles.	Literature Review

Source: Author's Compilation, 2022

The flow diagram below shows the processes involved in carrying out this research.



**Figure 3: Flow Diagram**

Source: Author's Work, 2022



## RESULTS PRESENTATION AND DISCUSSIONS

This section presents the data collected and the results obtained in the course of the analysis. The results were presented using relevant map, chart and table which were analyzed and discussed thereafter with a view to satisfy the purposes of the research.

### Identification and Distribution of Hotels

This result shows the hotels in the metropolis and their absolute location on the map. One hundred and ninety (190) hotels were identified with 23.1% of the hotels located in Kawo/Mando area of the metropolis due its cosmopolitan nature and high commercial activities in the area, it is closely follow by Barnawa/Narayi with 22.1% while the areas with fewer number of hotels in the metropolis are Gonin-Gora/Ungwan Romi and Kurmin Mashi with 7.4% and 5.3% respectively which is as a result of their location along the fringes of the metropolis and the sparseness of hotels in these areas is also attributed to the fact that the clusters are busy and noisy with very few services located in the areas as shown on Table 2.

**Table 2: Distribution of Hotels in the Metropolis According to Clusters**

Cluster	Number of Hotels	Percentage
Barnawa/Narayi	42	22.1
Sabo/ Mahuta	30	15.8
Kawo/Mando	44	23.1
Kakuri/Kudende	28	14.7
Malali/Ungwan rimi	36	18.9
Doka	26	13.7
Gonin-gora/ Ungwan Romi	14	7.4
Kurumin Mashi	10	5.3
Total	190	100

Source: Author's Work, 2022



The hotels are mostly located within the city center and are situated along major roads for easy accessibility as shown on Figure 4.

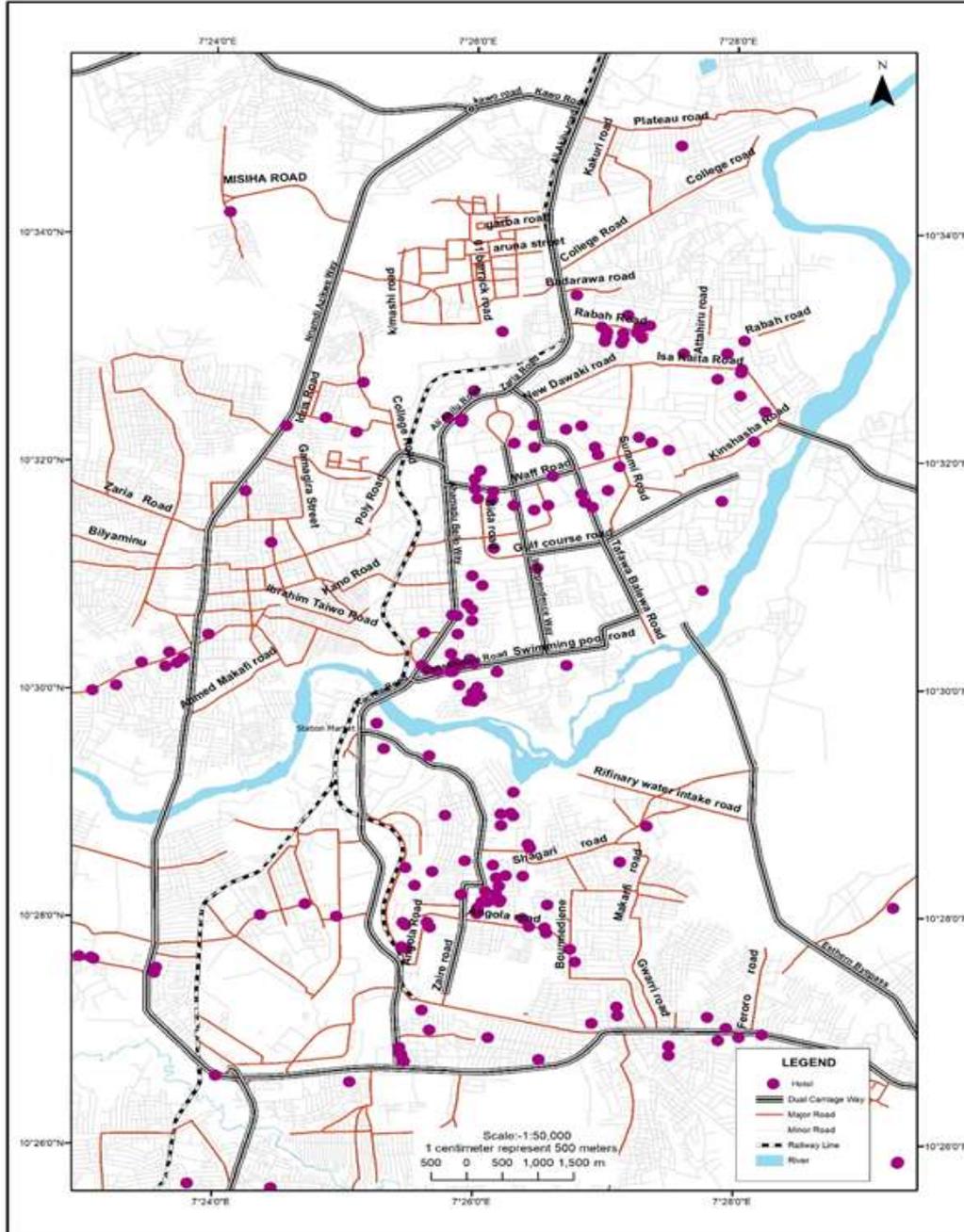


Figure 4: Spatial Distribution of Hotels in Kaduna Metropolis

Source: Author's Analysis, 2022

### Classification of Hotels in Kaduna Metropolis

The results of the classification of hotels in the metropolis was based on the international standard criteria for hotel classification where a One-



Star hotel provides a limited range of amenities and services, but adheres to a high standard of facility-wide cleanliness. Two-Star hotel provides good accommodation and better equipped bedrooms, each with a telephone and attached private bathroom. Three-Star hotel has more spacious rooms and adds high-class decorations and furnishings and color TV. It also offers one or more bars or lounges. Four-Star hotel is much more comfortable and larger, and provides excellent cuisine (table d'hote and a la carte), room service, and other amenities. Five-Star hotel offers most luxurious premises, widest range of guest services, as well as swimming pool and sport and exercise facilities.

Based on international standard classification mentioned above, the results show that 39.5% of the hotels in the metropolis fall within the category of one (1) star hotel, while 15.8% were fall within two (2) star hotel category and 9.5% of the hotels in the metropolis were in the three (3) star category. It is worthy of note that the result reveals that about 32.2% of the hotels in the metropolis fall below the category of one (1) star hotel which is indeed worrisome. In addition, it was also observed that none of the hotels in the metropolis provides services that qualify them to be in the four (4) and five (5) star classification as shown on Figure 5 and 6.

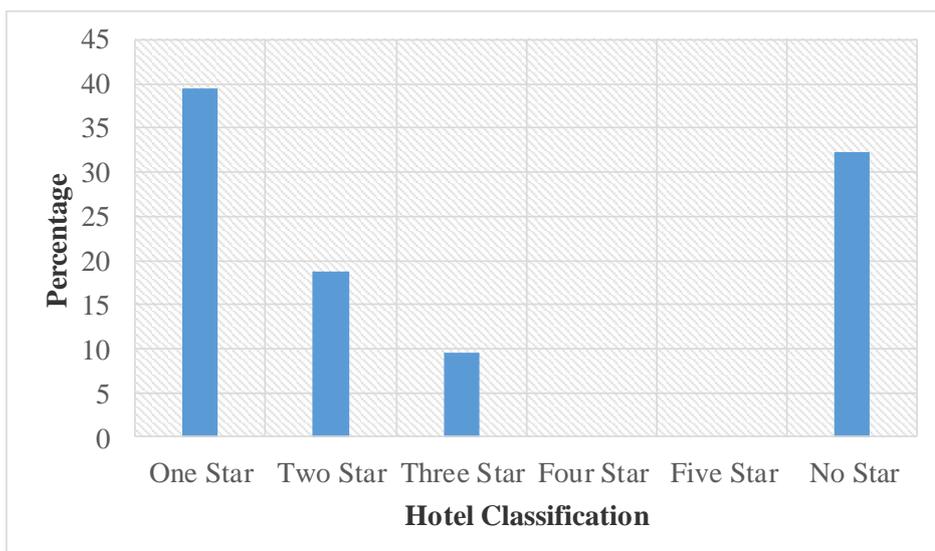


Figure 5: Hotels Classification  
Source: Authors Analysis 2022

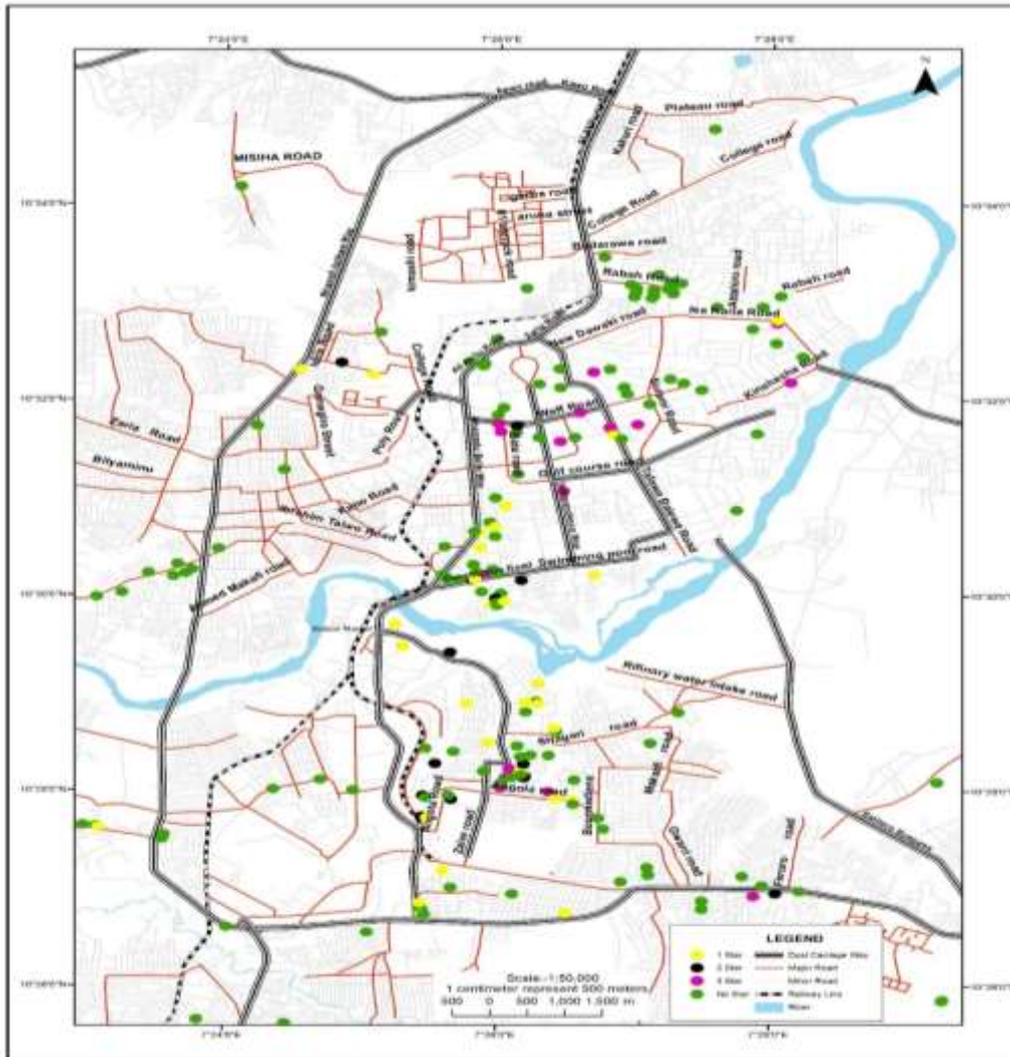


Figure 6: Classification of Hotels based on Category  
 Source: Authors Analysis 2022

### Pattern of Distribution of Hotels

The pattern of the distribution of hotels was determined using the average nearest neighbour in spatial statistic toolbox of ArcGIS version 10.8.1 environment. The average nearest neighbour analyses calculates the nearest neighbour index (which is a measure of the distance between each hotel location centroid and its nearest neighbour's centroid location. It then averages all these nearest neighbour distances). These parameters were used as the basis for the determining whether the distribution is clustered, dispersed or random. Table 3 shows the Nearest Neighbor Ratio, z-score and p-value.



Table 3: Distribution Pattern of Hotels

Kaduna Metropolis	
Observed Mean Distance	121.33 Meters
Expected Mean Distance	763.55 Meters
Nearest Neighbor Ratio	0.484211
z-score	-21.85611
p-value	0.0000000

Source: Author's Analysis, 2022

Table 3 shows that nearest neighbour index for hotels in Kaduna metropolis is 0.484211 with z-score of -21.85611. According to Clark and Evans (1954), if the index (average nearest neighbor ratio) is less than 1, the pattern exhibits clustering. If the index is greater than 1, the pattern is toward dispersion. Based on this assertion, the result shows clustering in the pattern of distribution of hotels and this assertion is further shown in Figure 7.

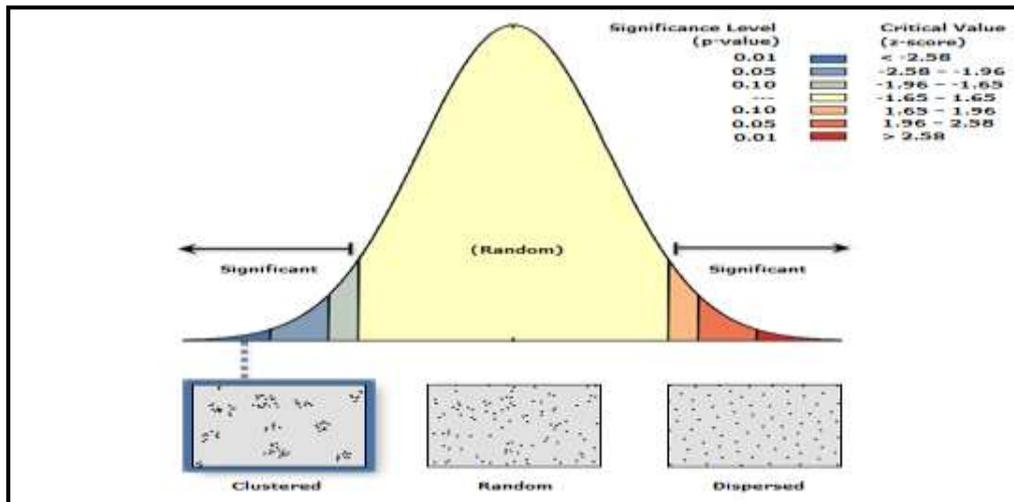


Figure 7: Distribution Pattern of Hotels in the Study Areas

Source: Author's Analysis, 2022.

## CONCLUSION AND RECOMMENDATIONS

Geographic features are not evenly distributed on the earth surface. It clumps in some areas and is almost absent in others. This study analyzed the spatial distribution of hotels in Kaduna metropolis. The use of GIS has proven effective in not just the area of geo-spatial analysis, but also a wide variety of fields and purposes as a result of its sophisticated tools and features integrated for capturing, storing, managing,



processing, analyzing and displaying spatially referenced data. The technology has proven to be an effective tool in geospatial analysis of hotels. The following recommendations were made based on the findings:

1. Government should encourage investors to invest in the hotels owing to the fact that the metropolis is without a single hotel in the four and five star categories.
2. The state government should reserve pieces of land in all districts that made up of the metropolis and allocate strictly to those who are interested in investing in the hotels.
3. Hoteliers who already have hotels should endeavor to upgrade their services so that they can compete with other international brands.
4. The State Ministry of Culture and Tourism should embark on regular monitoring and evaluation campaign to ensure that hotels are duly registered and maintain the expected standards.
5. A minimum standard should be set for hoteliers who desire to operate in the metropolis and the rules followed strictly. This will prevent the registration of hotels that fail to meet the minimum requirements.

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