MAPPING HOTEL DISTRIBUTION AND ACCESSIBILITY IN RELATION TO CARNIVAL ROUTES AND URBAN FEATURES IN CALABAR METROPOLIS, NIGERIA

Violet Bassey Eneyo*
University of Calabar, Department of Geography and Environmental Science, Calabar, Nigeria, e-mail: violeteneyo@unical.edu.ng, https://orcid.org/0000-0002-4867-0471
* Corresponding authors name and email address: violeteneyo@unical.edu.ng

Abstract

This research examines the spatial distribution pattern and accessibility of hotels in relationship to carnival routes and other places of interest in Calabar Metropolis. The research adopted a spatial approach, which includes GPS data collection and GIS methodologies, to examines 24 hotels along four major carnival routes. Findings demonstrated a considerable clustering of hotels along carnival routes, which contributed to greater revenue and employment prospects. The research underscores the necessity of strategic spatial planning for urban tourism development, highlighting the consequences for long-term urban growth and economic development. Results calls for integrated urban strategies addressing both environmental and infrastructural concerns.

Keywords: GIS analysis, spatial distribution, carnival routes, hotel accessibility, urban infrastructure, economic impacts

INTRODUCTION

Tourism significantly contributes to urban socio-economic growth worldwide, influencing employment, urban revitalisation, and economic diversification. Hotel accommodation, in particular, constitutes a critical element of tourist infrastructure, that directly affects a city's ability to attract large number of potential visitors, maintain economic growth, and also help to promote urban regeneration (Eneyo et al., 2021). Additionally, hotels in most cities across the globe contributes to the generation of significant economic benefits through creating employment opportunities, encouraging local businesses via procurement, and also contributing to increase in public revenue through means of taxes and other levies/charges (Velaoras et al., 2021; McKercher et al., 2025). Calabar Metropolis, which has become known for its rich historical cultural heritage and especially its internationally recognised yearly Calabar carnival and beauty pageant amongst others exemplifies by the vital role hotels plays in urban tourism. The Calabar Carnival has recently played a very significant role in positioning the metropolitan city of Calabar as an essential tourist destination, which has considerably influenced urban planning enhancement (Agina et al., 2025; Eneyo et al., 2023; Inyang, 2023).

Despite these advantages, challenges related with the spatial distribution of hotels, accessibility, as well as infrastructural inadequacies remains, thereby posing critical concerns for tourism authorities and urban planners. These challenges include among others, uneven distribution of hotels, discrepancies in hotel accessibility relative to notable tourist attraction sites and events, environmental concerns which might results from increased visitors' activities in the area, and persistent urban congestion (Chen and Wang, 2022; Valenzuela-Ortiz et al., 2025; Inyang, 2022). Therefore, to address these major issues requires a more comprehensive and detailed spatial and economic analyses to understand the consequences of hotel distribution and accessibility in relation to major tourism events and urban infrastructures. Several studies globally have explored aspects of hotel distribution, tourism infrastructure accessibility, and their implications for urban sustainability (Irazábal, 2018; Inyang, 2022; Eneyo et al., 2023; Inyang, 2023).

Also, Eneyo (2022) highlighted the importance of Geographic Information Systems (GIS) in mapping hotel locations to optimise urban tourism planning, while Li et al., (2015) and Agina et al. (2025), emphasised the significance of transportation infrastructure in enhancing tourist accessibility to hotels and

other facilities. Yang et al., (2018) and Lim et al., (2019) in their studies provided valuable insights into event-based tourism through examining the strategic importance of most selected hotel proximity to major tourism events and attractions. However, this study focuses on cities in industrialised nations, leaving considerable gaps regarding urban environments in a rapidly developing locations, notably in African cities like Calabar Metropolis. Again, this empirical study specifically addressing hotel spatial distribution in the area, accessibility, economic implications, and employment trends in relation to cultural events such as carnivals within African urban context are notably sparse.

This research addresses this identified gap by investigating the hotel geographical distribution and accessibility in the area concerning urban infrastructure, carnival routes, revenue generation, and employment rates across many years. Moreso, understanding these dynamics is very important at this point, given the recent rapid urbanisation as well as increasing economic importance of tourism in the area. Again, current urban planning policies which has been initiated by the Cross River State Government has underscore the timeliness and relevance of this study in the city of Calabar. Thus, such policies not only include infrastructure upgrades but also include road expansions, and the development of sustainable urban mobility solutions which is explicitly designed to improve accessibility and also to reduce environmental impacts during key events in the metropolis such as the Calabar Carnival, Iboku boat regatta, Nyoro Ekpe, beauty pageant and Calabar marathon race (Akeh et al., 2023). Concurrently, the rapid advancements in the use of Geographical Information System (GIS) technology now have enable more precise mapping as well as comprehensive spatial analyses, significantly enhancing the potential for detailed and actionable insights (Udonwa et al., 2024; Sunny, 2024).

Therefore, this study aim to achieve the following specific objectives: (1) to investigate the spatial distribution patterns of hotels in Calabar Metropolis; (2) to explore hotel accessibility in relation to carnival routes and other important urban infrastructure; and (3) to evaluate economic implications, particular revenue generation and employment rates, due to hotel locations in relation to carnival routes. This research will address the underlisted research questions: (1) What is the spatial distribution patterns characterise of hotel locations in Calabar Metropolis, and how do these correlates with carnival routes in the area? (2) How accessible are hotels located close to carnival routes concerning major urban transport infrastructures? (3) What economic implications, particularly government revenue and employment generation, are related with hotel locations near carnival routes across several years? Through systematically integrating spatial analysis, urban planning frameworks, and economic assessment, this study will add value to the empirical insights to the broader discourse on sustainable urban tourism.

LITERATURE REVIEW

Hotel Distribution and Accessibility in Urban Tourism

The distribution pattern of hospitality infrastructure, particularly hotels and other accommodation sectors, within urban contexts is fundamentals to the broader study of tourism management, urban geography and planning. Within these disciplines, considerable focus is given to understanding the fundamental factors that affects the location os hotel, accessibility, and the consequences of spatial planning on tourism growth. This literature review critically examines existing scholarly contributions, grouped into thematic clusters, to contextualise the significance of hotel distribution and accessibility, particularly in relation to carnival routes and essential urban infrastructure. Broadly, hotel distribution and accessibility have been extensively studied as critical factors in the effectiveness of urban tourism strategies. According Akeh et al., (2023), tourism facilities, especially lodging facilities, highly considerably influences attraction competitiveness and visitors' satisfaction. Again, their research also illustrates the link exist between urban planning strategies and the effective growth of sustainable tourism facilities. In the same vein, Eneyo et al., (2021) and Del Casino Jr and Hanna (2000), further underscores the need of integrating tourism development into a more holistic urban planning frameworks to guarantee a balanced economic development as well as a more sustainable urban regeneration. Such integration often influences the spatial distribution of hotels, aiming to optimise accessibility, reduce environmental degradation, and enhance visitor experiences.

Spatial distribution and the clustering of hotels have been specifically examined in several studies. Sharpley (2009) and Gorrini and Bertini (2018), identifies how hotel clustering around key attractions and events contributes to increased economic activities, employment, and revenue generation, although potentially exacerbating urban congestion and environmental strain if not well managed. Lew and McKercher (2006) and Eneyo (2018), utilises Geographic Information Systems (GIS) to illustrate spatial relationships between hotels and tourist attractions, highlighting the utility of advanced mapping techniques in effective tourism management. Their methodological approach, employing spatial analytical tools, proves particularly relevant to studies aiming for precise mapping and analysis of hotel distribution and accessibility. Additionally, transportation infrastructure and accessibility is another critical theme. Similarly, Prideaux (2000) and Ikezam (2022), highlights that hotel accessibility through powerful transportation systems significantly affects visitors' destination choices and general satisfaction. The study illustrates that most cities with good transportation networks are more likely to experience frequent visitors, higher economic returns and extended stays. In tandem, Getz (2008) and Akeh et al., (2023) illustrates event-based tourism, in particular how the location of accommodations to key event sites and routes as well affects visitors' satisfactions and experiences, economic impacts and hotel occupancy rates. Stabler (2003) and Ikezam (2022), similarly contends that optimal hotel locations near significant tourism events sites can considerably improve local economic benefits generally as well as the overall urban vitality. Nonetheless, both studies warn against feasible congestion and overcrowding that could compromise visitor experiences as well as strain urban infrastructure in cities.

Another important aspect explored by scholars is the economic consequences of hotel location. Nevertheless, Akeh et al., (2023) demonstrate economic data to show how strategically positioned accommodations, especially those that are situated along key event routes, governmental revenue and generate increased employment rates as compared to less ideally situated establishments. Their researches emphasise the direct link which exist between spatial location, sustainable urban growth, and economic performance recommending focused policy measures to leverage these spatial-economic interactions effectively. Furthermore, environmental sustainability also arises as an essential subject within hotel distribution studies. Wan et al., (2023) and Akeh et al., (2023) explores the environmental consequences linked with unequal hotel distribution, underscoring how poor planning and uneven accessibility could lead to urban congestion and environmental degradation in an area. The study promotes a more strategically and ecologically informed urban planning strategies to guarantee sustainability within urban tourism setting.

Other studies directly linking hotel distribution to urban events and festivals in most regions globally are rapidly growingly significant within urban tourism study (Wan et al., 2023; Eneyo , 2018; Akeh et al., 2023; Eneyo et al., 2023). Ezenagu et al., (2022) and Ikezam (2022), provide insightful study into how key cultural festivals in Nigeria like the Calabar Carnival, Leboku new yam festival among others influence hotel distribution patterns, local economic activities and occupancy rates. Their research emphasises the transformative potential of key cultural events on urban settings, most importantly impacting local employment rates in the area, improvements to infrastructure, as well as economic diversification. This subject therefore aligns really closely with the theme of the present study, emphasing the particular importance of event-based spatial geographical planning. Although there is much global study on the spatial distribution of hotel, significant knowledge gaps remain for quickly urbanising cities in poor some countries, particularly in Africa. Most researches mostly focus on urban centres in rich countries, hence offering little understanding of the particular impact on the socio-economic and infrastructure dynamics common in major cities like Calabar and other cosmopolitan cities in similar settings. This literature review thus far has poorly revealed the crossroads of urban events, hotel distribution, economic results, and employment patterns in a rapidly growing urban settings, which creates a vital research gap for this paper which aims to solve.

Recent development in the geospatial technology have considerably improved methodological approaches in spatial analysis studies. Longley et al. (2015) and Akeh et al., (2023) for instance, demonstrated that

advanced GIS methods adopted in this study which enable scholars and urban planners to conduct a thorough spatial studies, effectively, hence mapping hotel distribution trends and also assessing accessibility measurements. Their study in particular, illustrates the need of leveraging modern technological capabilities for accurate urban planning and sustainable tourism growth, especially in a rapidly growing urban location. Furthermore, the most current regulatory developments greatly influence hotel location dynamics within urban tourism settings. For instance, Eneyo et al., (2023) revealed that the Cross River State Government Gazette in 2022 documents that the ongoing infrastructural improvements and sustainable transportation initiatives specifically targeting improved accessibility during key tourism events in the area. These regulatory changes necessitate for empirical studies to explore their efficacy in promoting balanced hotel distribution in the area, environmental sustainability and economic growth. Therefore, the relevance of timely studies, like the present study, becomes even more significance given these recent urban development project.

RESEARCH METHODOLOGY

1. **Study area**

The research was carried out in Calabar Metropolis, Nigeria. The study area is well known for its vibrant tourism activities, notably the yearly Calabar Carnival, which attracts both domestic and foreign visitors. The metropolis is made up of Calabar South and Calabar Municipality, and also has distinctive urban features such as residential zones, business districts, administrative centres, and well-developed transportation infrastructure (see Figure 1). Additionally, four carnival routes were identified as research focal points. these areas are Marian Road, MCC Road, Mary Slessor Avenue, and Murtala Mohammed Highway. These routes were chosen because of their vital role in hosting Calabar Carnival and their appeal for hotel operators.

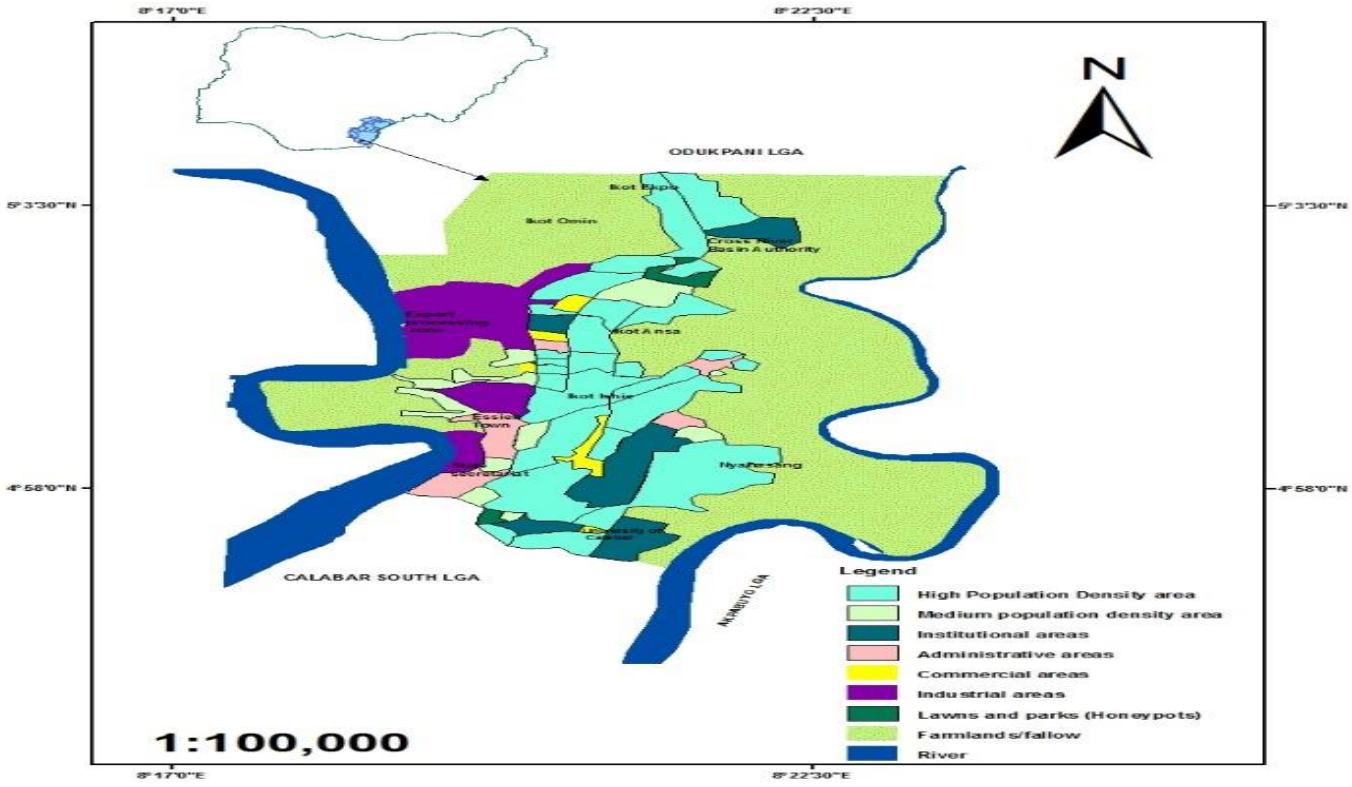

Figure 1. Study area (Source: Author's GIS Analysis, 2024)

2. **Research design and data collection**

The study utilised a cross-sectional survey design supplemented by geospatial analyses. primary and secondary data were employed. Primary data were obtained through field surveys through the use of handheld Global Positioning System (GPS) to get coordinates of the 24 sample hotels within the study

area. The study also used observational checklists to record each hotel's location with its proximity to carnival routes, roadways, and other important urban features in the area. Interview was conducted with proprietors of the 24 sampled hotels or their representation. Additionally, Secondary data were obtained from records from related government agencies including State Ministry of Lands and Housing, Cross River State Tourism Bureau, and hotel management archive. These included location of hotels, revenue and employment figures from year 2015 to 2024. The population of the study comprised all operating hotels located within 1km of the specified carnival routes. Again, purposive sampling approach was adopted to choose the 24 hotels which were geographically distributed within the four carnival routes, representing a comprehensive census of accessible and functional hotels within the established buffer zone. Moreso, the study also used purposive sampling method to obtained information on the factors influencing the location pattern and their challenges.

3. Analytical tools and procedures

Data collected from GPS were later transferred into ArcGIS version 9.3 for the spatial analysis. All the hotels were geocoded and layered with the current existing spatial data of the study area, such as population density zones, roads, and carnival routes. One null hypothesis was formulated and tested. The hypothesis stated thus: H_0: Hotels in Calabar Metropolis are randomly distributed. The Nearest Neighbour Index was employed to test the hypothesis within the GIS. The Nearest Neighbour Index (NNI) was used to analyse the spatial distribution patterns of the hotels. Also, a statistical tool designed to know if the spatial pattern of point characteristic is random, uniformly distributed or clustered. The Nearest Neighbour statistic (Rn) formula is given as: $Rn = \times / E(d)$. Where $\times$ is the observed mean distance between the nearest neighbours; E(d) is the expected mean distance for a random distribution and its interpretation of Rn values was guided by an established standards which is $Rn < 1.0$ indicating clustering, $Rn > 1.0$ indicates dispersion and $Rn = 1.0$ shows randomness. Again, buffer analysis was done to evaluate hotel accessibility in relation to urban features and carnival routes. The concentric buffers were created at a distance of approximately 0.2 km, 0.5 km, and 1.0 km respectively to classify accessibility zones within carnival routes. The sampled hotels were then classified into the various buffer zones to investigate their spatial relationship within carnival routes as well as their accessibility levels.

4. Socioeconomic evaluation of hotel distribution and ethical consideration

Descriptive statistics were also employed to examine variations in employment and revenue across the various carnival route buffers ranging from 2015 to 2024. These data enabled the researchers to determine temporal trends and economic outcomes related with hotel location in relation to urban and carnival event infrastructures. This study ensured compliance with ethical norms through obtaining necessary clearances from the appropriate authorities. Data collected from various selected hotels and government entities were anonymised where necessary, and the respondents were notifying of the study's academic goal. The data used for GIS mapping were publicly available and used only for both academic and planning purposes.

RESULTS

Spatial distribution patterns of hotels

The study examines the spatial distribution patterns of hotels in Calabar Metropolis, Nigeria using GIS tools to determine the clustering or dispersion patterns within the study area (see Figure 2). Figure 2 shows that a total of 24 hotels were identified and mapped within Calabar Metropolis.

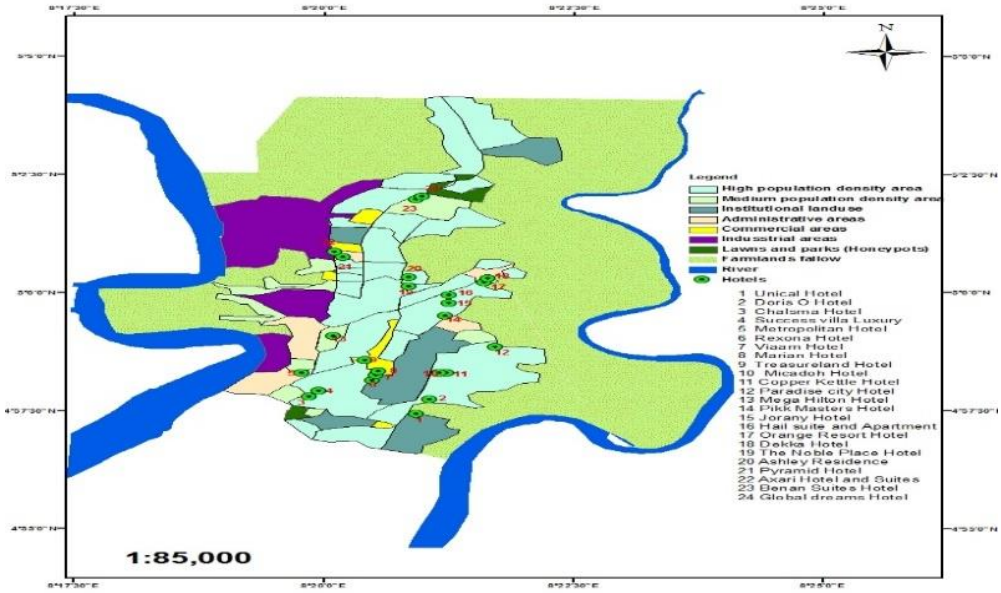

Figure 2. Spatial distribution patterns of hotels in Calabar Metropolis (Source: Author's GIS Analysis, 2024)

Additionally, the survey results as indicated on Table 1 reveals that hotels varied in proximity to major roadways and carnival routes in the area, with clustering seen especially around central business districts (CBD) and famous carnival routes (viz -a viz, Mary Slessor Avenue, Marian Road, MCC and Murtala Mohammed highway). Table 1 further provides a summary of each hotel's location in relation to major roads in the area. The Table depicts the distance to the nearest major roads, maximum distances between hotels, as well as their nearest neighbour hotels. This table offers a detailed analysis into spatial connections and connectivity.

Table 1. Distribution of hotels, their distance to major roads and nearest neighbour hotel

s/n	Hotel Name	Location	Distance from major roads (km)	Maximum Distance (m)	Nearest Neighbour Hotel
1.	Treasureland	Off Marian	0.05	549.5	Marian
2.	Micadoh	IBB Way	0.06	40.6	Copper Kettle
3.	Copper Kettle	IBB Way	0.01	40.6	Micadoh
4.	Paradise City	Off Marian	0.48	137.5	Copper Kettle
5.	Mega Hilton	Marian Road	0.02	1651.3	Treasureland
6.	Pikk Masters	Marian Road	0.7	519.8	Jorany
7.	Jorany	MCC	0.18	330.4	Hail Suite and Apartment
8.	Hail Suite and Apartment	MCC	0.1	330.4	Jorany
9.	Orange Resort	MCC	0.1	1270.5	Dekka Resort
10.	Dekka Resort	MCC	0.1	1270.5	Orange Resort
11.	The Noble Place	MCC	0.01	343.6	Ashley Residence
12.	Viaaem	Off Marian	0.05	35.2	Marian
13.	Success Villa Luxury	Otop Abasi	0.02	237.6	Chalsma
14.	Marian	Off Marian	0.01	35.2	Viaaem
15.	Doris O	Unical Road	0.02	579.8	Unical
16.	Metropolitan	MM Highway	0.00	782.1	Success Villa Luxury
17.	Rexona	Off Marian	0.14	211.9	Metropolitan
18.	Pyramid	MM Highway	0.02	249.9	Axari and Suites
19.	Global Dreams	Federal Housing	0.1	34.8	Benan Suites
20.	Axari and Suites	MM Highway	0.06	249.9	Pyramid
21.	Ashley Residence	MCC	0.08	343.6	The Noble Place

22.	Unical	Unical Road	0.00	579.8	Doris O
23.	Benan Suites	Federal Housing	0.1	34.8	Global Dreams
24.	Chalsma	Otop Abasi	0.01	237.6	Success Villa Luxury

(Source: Authors fieldwork, 2024)

Also, the hypothesis formulated to examine the spatial distribution pattern of hotels was tested through the nearest neighbour index analysis. The coordinates of each hotel and the distances to their nearest neighbours were computed using ArcGIS Spatial Statistical Toolbox version 9.3. The results from the analysis yielded a nearest neighbour value (Rn) of 0.7. However, an Rn value that is less than 1.0 indicates clustering in the distribution pattern of hotels. According to spatial statistical convention (Eneyo, 2018; Inyang, 2024; Omori et al., 2025; Getis and Ord, 1992), this result confirms a clustered distribution pattern of the hotel. The null hypothesis was rejected, indicating that hotels were not randomly distributed but exhibits a significant inclination towards clustering. Figure 2 depicts the distribution pattern of hotels in relation to urban features, like roadways, carnival routes and population density. Moreso, the results show that hotels are predominantly located close to high and medium population density area, particularly near CBD and major roads, underscoring their strategic locations in relation to carnival routes and essential urban infrastructure in the city. This finding confirms that the spatial distribution of hotels in the area exhibits a clustered pattern. The study also is of the opinion that clustering closely relate to accessibility, primary transportation routes as well as carnival event locations, demonstrating strategic hotel positioning aimed at optimising economic benefits and also visitor convenience especially during carnival periods.

Figure 3 indicate a thorough analysis of hotel accessibility .and its relationship to carnival routes and other essential urban transit facilities. The findings indicate that most of the hotels were strategically situated near or along carnival routes, hence guaranteeing easy accessibility for visitors and participants during Calabar carnival event. The map reveals the proximity of these selected hotels to basic roadways and other vital urban infrastructures, which include among others institutional areas and commercial centres, thus, emphasising the crucial role of transit accessibility in hotel sites decisions within the area.

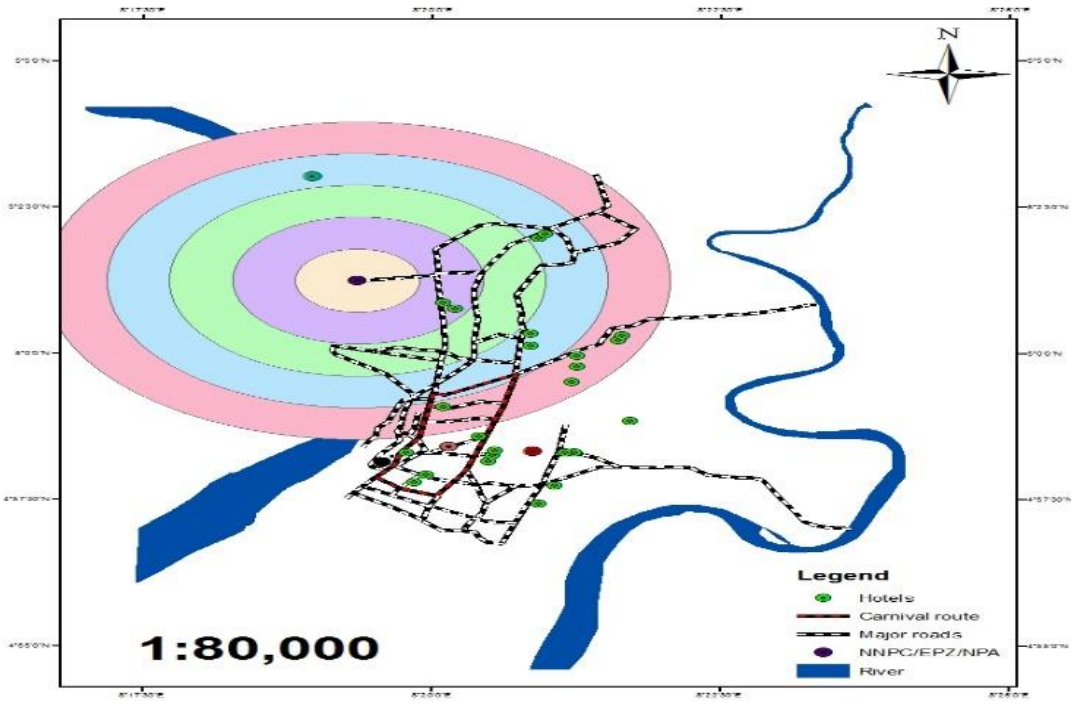

Figure 3. Hotels located in relation to carnival routes and other places of interest (major urban infrastructure (Source: Author's GIS Analysis, 2024)

Also, concentric buffers as seen in Figure 3 show varying degrees of proximity from a central carnival node, hence demonstrating the gradation of hotel access in relation to the carnival route. Figure 3 further depicts that hotel within the innermost buffers (especially the one with purple and yellow zones) shows the highest accessibility, being nearest to both the major roads and carnival route. The result indicate that these zones are densely populated with several hotels, implying strategic positioning for commercial benefits during festive season. Also, Figure 3 show that hotels located beyond the buffers zone (that is the pink and green zones) have somewhat reduced accessibility, which might in due course affect their patronage during peak-traffic seasons. The clustering of hotels within tighter buffers validates the previous nearest neighbour analysis showing a non-random, nucleated distribution of hotels in the area. This spatial layout depicts intentional planning by hotel planners or developer to make use of the existing cultural event routes and urban infrastructure. Also Figure 3 further reveals that hotels located within 1km around Mary Slessor Avenue were 3, Marian Road axis had about 11 hotels, MCC have a total of 6 hotels while Murtala Mohammed Highway have hotels

Regarding the factors that influence the location of hotels, Figure 4 depicts that hotel are mostly influenced by spatial and economic considerations in their location decisions. The Figure further demonstrates the key factors contributing to hotel location along Carnival routes and strategic urban routes. Figure 4 reveals the leading factor, such as proximity to carnival routes, which accounted for 25% followed by access to major roads (20%) as well as commercial activity zones which constitutes 18%. Similarly, proximity to government institutions constituted 15% and security and safety was 10%. Additionally, results show that environmental attractiveness constitutes 7% while proximity to residential areas accounted for 5% of the total responses. Moreover, proximity to residential areas was considered slightly crucial but still appropriate to investors and developers. The observations from Figure 4 highlight the fact that accessibility, institutional presence, tourism demand, and urban security remain critical determinants factor in the spatial planning of hospitality infrastructure or facilities in the area.

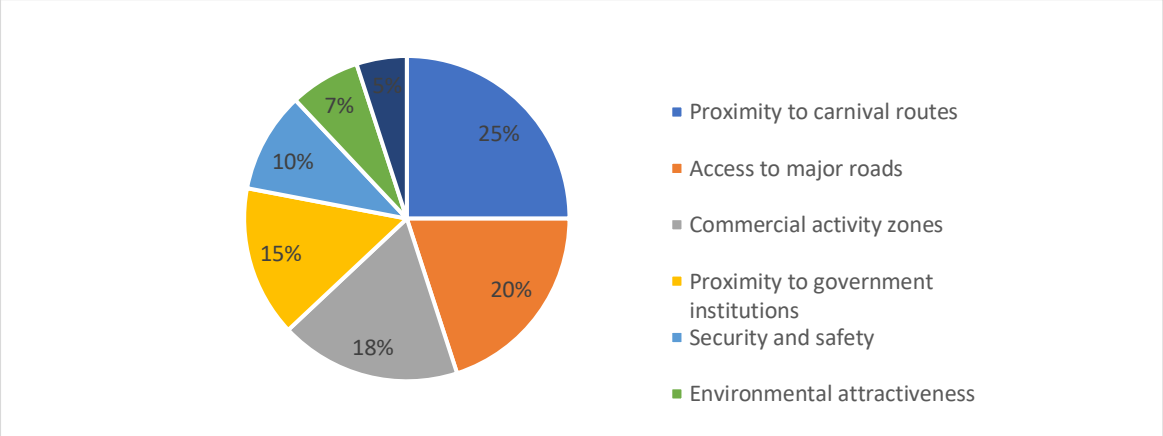

Figure 4: Factors influencing location of hotels in Calabar Metropolis

(Source: Authors fieldwork, 2024)

Nevertheless, Figure 5 highlights the various constraints associated with the location of hotels across Calabar Metropolis. The figure depicts that urban congestion constitutes 30%, making it the most significant challenge. This was followed by noise pollution, limited land availability, and poor waste management amongst others which constitutes 70%. Results in Figure 5 therefore call for the need for proactive urban management strategies in order to reduce spatial and environmental pressures that may arise from the concentrated tourism infrastructure in the area.

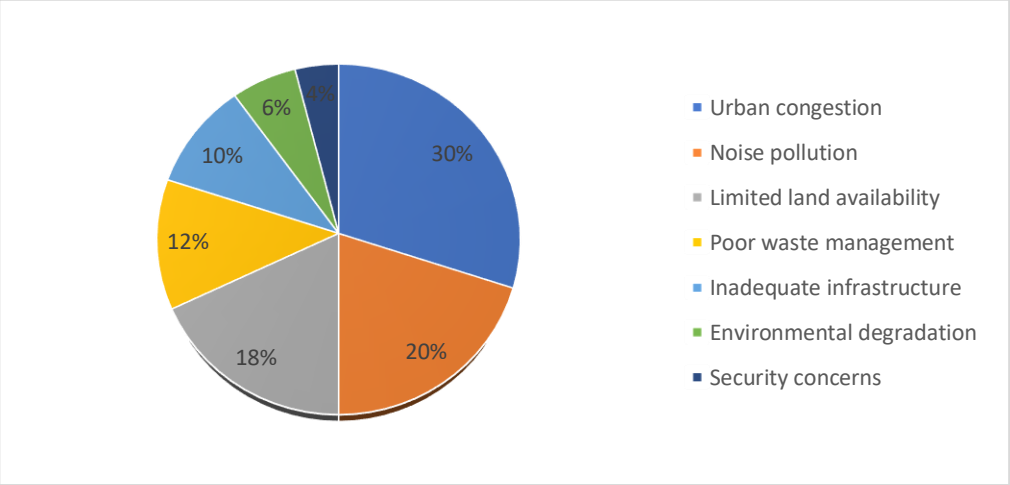

Figure 5: Challenges associated with the location of hotels in Calabar Metropolis
(Source: Authors fieldwork, 2024)

Table 2 shows revenue data from hotels located within 1km of each of the carnival routes. The Table illustrates those hotels around 1km within Marian Road recorded the highest revenue earnings between 2015 and 2024, reaching approximately ₦51.4 million in 2024, while hotels around Mary Slessor Avenue recorded stable but lower growth. On the issue of employment statistics,

Table 2: Annual revenue generated from hotels within 1km around each carnival route across several years

Carnival Route	2015 (N)	2016 (N)	2017 (N)	2018 (N)	2019 (N)	2020 (N)	2021 (N)	2022 (N)	2023 (N)	2024 (N)
Marian Road	35.7	38.7	39.9	42.6	44.8	45.9	46.3	47.4	49.9	51.4
MCC	28.4	30.6	31	33	35	37.8	38.5	40	42	44.8
Murtala Mohammed Highway	32.8	34	36.7	37.5	38.9	40.1	41.2	43	45.7	46.7
Mary Slessor Avenue	29.7	31.5	33.4	35	36.9	37.3	38	39.9	41.4	43

N Naira in million

(Source: Government and hotel records, and authors fieldwork, 2024)

Table 3 shows that hotels around Mary Slessor Avenue had the highest number of staff. As of 2015, the total number was 58 while in 2024 it grew to 74. These results in Table 2 and Table 3 demonstrate that nearness to carnival routes substantially improves employment generation and revenue generation in the hospitality sector in the state.

Table 3: Annual employment generated from hotels within 1km around each carnival route across years

Carnival Route	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024

Mary Slessor Avenue	58	60	62	64	66	67	68	70	72	74
Maria Road	47	49	51	52	54	56	57	58	59	60
MCC	53	54	56	58	60	62	63	64	65	67
Murtala Mohammed Highway	48	50	52	53	55	57	58	59	60	62

(Source: Hotel records and authors fieldwork, 2024)

DISCUSSION

This study on the spatial distribution patterns of hotels in Calabar Metropolis indicated a clear tendency of clustering, particularly along major carnival routes and important urban pathways like Marian Road, Mary Slessor Avenue, Murtala Mohammed Highway and MCC Road. The results of the NNI (Rn = 0.7) indicated this spatial pattern as significantly clustered, refuting the null hypothesis what stated that hotels are randomly distributed in the area. This clustering pattern is consistent with the findings of Eneyo et al. (2021), who stated that tourism infrastructures, especially hotels, tends to cluster near metropolitan centres and event routes in order to enhance profitability and accessibility. Consequently, the GIS-based buffer study further confirmed this observation, revealing that some hotels were located within the 0.2 km to 0.5 km of the carnival routes and major highways, thus enjoying optimum accessibility. This result findings supports the assertion of Akeh et al. (2023) and Udonwa et al. (2024), who revealed that the geographical proximity to major infrastructure improves the functional utility as well as economic performance of tourism infrastructures. In the context of Calabar metropolis, hotel concentration around these buffers provides high visitors footfall during events such as the Calabar Carnival, thereby boosting the potential for improved customer satisfaction and their patronage.

Economic evaluation, which was based on revenue generation as well as employment figures ranging from 2015 to 2024, revealed a strong correlation existing between economic output and hotel location. the finding depicts that hotel located along Marian Road typically generated the highest revenue, followed closely by those along MCC Road, Murtala Mohammed Highway, and Mary Slessor Avenue. This trend is consistent with the results of Eneyo et al. (2022), that indicated that revenue in the hotel industry is significantly impacted by closeness to high-traffic cultural events as well as commercial hubs. Employment figure reflected revenue trends, illustrating that hotel clusters contribute significantly to local job creation, with MCC and Mary Slessor Avenue showing consistent employment growth. These findings affirm the strategic economic value of spatial planning in urban tourism development, as argued by Eneyo et al. (2023).

Furthermore, the analysis of factors influencing hotel location as indicated in Figure 4 showed that proximity to carnival routes (25%), access to roads (20%), and proximity to commercial areas (18%) were the most influential determinants. This is in line with the study of Yang et al. (2018) and Eneyo, (2028), which identified accessibility and urban economic zones as critical determinants of hotel location. However, the identified challenges in Figure 5 like urban congestion (30%), noise pollution (20%), and poor waste management (12%) highlight the implications of such concentrated development, echoing the warnings issued by Wan et al. (2023) and Inyang (2024) about the risks of environmental strain and urban disorder in unregulated spatial clustering. Collectively, these findings reveal that hotel distribution in Calabar is strategically motivated by accessibility to urban infrastructure and carnival events, and this spatial strategy significantly enhances both economic returns and employment rates. Thus, the problems highlight an urgent need for a well-coordinated spatial policy that assure environmental sustainability, equitable tourism advantages and balanced distribution.

CONCLUSION

This research assessed the geographical distribution and accessibility of hotels in relation to carnival routes and urban infrastructure in the area. Findings from the study revealed a clustered distribution pattern of hotels, majority in the city and carnival routes. Accessibility analysis affirmed that some hotels are located within walkable distances to carnival routes, to maximising patronage, visibility, and economic benefits. Again, job and revenue generation between 2015 to 2024 showed that some hotels close to Murtala Mohammed Highway and Marian generated more revenue and also create more jobs than others,

indicating a strong link between economic consequences and hotel location. These confirm pattern highlights the important role of spatial planning and accessibility in promoting tourism-led growth.

Nonetheless, the study also identified major challenges associated with hotel clustering, including congestion, noise, and environmental stress, which if unaddressed, could undermine the long-term sustainability of tourism infrastructure. Therefore, strategic urban planning interventions that promote spatial equity, infrastructural improvement, and environmental safeguards are imperative. The study therefore concludes that although the existing pattern of hotel development in Calabar Metropolis promotes tourism growth, future urban development strategies should follow a more integrated, holistic and spatially balanced approach. This will provide not only sustained long-term economic benefits, but also higher environmental quality as well as improved urban living for both residents and visitors.

REFERENCES

Agina, M.F., Farrag, D.A., Jaber, H.M., Fayyad, S., Abbas, T.T., Salameh, A.A., & Elziny, M.N. (2025). The influence of customer incivility on hotel frontline employees' responses and service sabotage: does co-worker support matter? *Geojournal of Tourism and Geosites*, 58(1), 89–104. https://doi.org/10.30892/gtg.58108-1393.

Akeh, L.B., Bassey, B.J., Odok, A.O., Odok, E.A., Uttah, C., Idika, D. O., Onnoghen, U.N., Akpanika, E.N., Onabe, D.B. & Eneyo, V.B. (2023). Insecurity and its Economic Impact on Calabar Nightclubs, Nigeria. *African Journal of Hospitality, Tourism and Leisure*, *12*(4), 1603-1617. https://doi.org/ 10.46222/ajhtl.20231204-158

Alsiehemy, A. (2023). Events-Based Service Quality and Tourism Sustainability: The Mediating and Moderating Role of Value-Based Tourist Behavior. *Sustainability*, *15*(21), 15303. https://doi.org/10.3390/su152115303

Chen, J., & Wang, X. (2022). Analysis on spatial distribution characteristics and configuration of tourist hotels based on artificial intelligence technology. *Wireless Communications and Mobile Computing*, *2022*(1), 8227294. https://doi.org/10.1155/2022/8227294

Del Casino Jr, V. J., & Hanna, S. P. (2000). Representations and identities in tourism map spaces. *Progress in Human Geography*, *24*(1), 23-46. https://doi.org/10.1177/03091325251327718.

Eneyo, V. B. (2018). The distribution of hospitality services in Uyo urban, Nigeria. *Journal of Tourism and Heritage Studies*, *7*(2), 137-149.https://doi.org/10.33281/JTHS20129.2017.2.10

Eneyo, V. B., Ajake, A. O., Offiong, E. E., Ushie, M. A., & Akpan, N. A. (2023). Exploring spatial pattern of eateries in Calabar city, Cross River State, Nigeria. *Spatial Information Research*, *31*(2), 167-179. https://doi.org/10.1007/s11067-018-9427-9

Eneyo, V. B., Attah, F. M., Antai, A. S., Adie, H. I., & Ochiche, C. A. (2022). Tourism Viability Status of Kwa Falls Ecotourism Site of Aningeje Rural Community, Cross River State, Nigeria. *Environment and Ecology Research*, *10*(2), 125-132. https://doi.org/10.13189/eer.2022.100202

Eneyo, V. B., Oba, D. O., Ochiche, C. A., Essien, D. A., & Antai, A. S. (2021). Economic impacts of curfew imposition on the nightclub industry in Calabar Metropolis, Nigeria. *African Journal of Hospitality, Tourism and Leisure*, *10*(3), 955-971. https://doi.org/ 10.46222/ajhtl.19770720.552

Eneyo, V. B., Ushie, M. A., Akeh, L. B., Udonwa, R. E., Esuabana, S. B., Idika, D. O., Itu, P. O., & Antai, A. S. (2022). Analysis of Geographical Distribution and Patronage of Fast Food in Calabar Urban, Nigeria. *African Journal of Hospitality, Tourism and Leisure*, *11*(6), 1969-1989. https://doi.org/10.46222/ajhtl.19770720.552

Eneyo, V.B., Ajake, A.O., Offiong, E.E. et al. (2023). Exploring spatial pattern of eateries in Calabar City, Cross River State, Nigeria. *Spatial Information Research*, *31*, 167–179. https://doi.org/10.1007/s41324-022-00458-1

Ezenagu, N. E., Okpoko, P. U., & Okpoko, C. C. (2022). Contribution of faith-based activities to tourism development in two religious sites in southwest Nigeria. *International Journal of Religious Tourism and Pilgrimage*, *10*(3), 5. https://doi.org/10.21427/7ddn-cj74.

Getz, D. (2008). Event tourism: Definition, evolution, and research. *Tourism Management*, *29*(3), 403-428. https://doi.org/10.1016/j.tourman.2025.105199

Gorrini, A., & Bertini, V. (2018). Walkability assessment and tourism cities: the case of Venice. *International Journal of Tourism Cities*, *4*(3), 355-368. https://doi.org/10.1108/IJTC-12-2024-305

Ikezam, P. (2022). Analysis of spatial distribution pattern of hotels in Port Harcourt Metropolis, Rivers State, Nigeria. *World Journal of Advanced Research and Reviews*, *15*(1), 602-618. https://doi.org/10.30574/wjarr

Ikezam, P. (2022). Analysis of spatial distribution pattern of hotels in Port Harcourt Metropolis, Rivers State, Nigeria. *World Journal of Advanced Research and Reviews*, *15*(1), 602-618. https://doi.org/10.30574/wjarr.2024.22.1.1200

Irazábal, C. (2018). Coastal urban planning in the 'Green Republic': Tourism development and the nature–infrastructure paradox in Costa Rica. *International Journal of Urban and Regional Research*, *42*(5), 882-913. https://doi.org/10.1111/1468-2427.13321

Li, M., Fang, L., Huang, X., & Goh, C. (2015). A spatial–temporal analysis of hotels in urban tourism destination. *International Journal of Hospitality Management*, *45*, 34-43. https://doi.org/10.1016/j.ijhm.2025.104175

Lim, C., Zhu, L., & Koo, T. T. (2019). Urban redevelopment and tourism growth: Relationship between tourism infrastructure and international visitor flows. *International Journal of Tourism Research*, *21*(2), 187-196. https://doi.org/10.1002/jtr.2253.

Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). *Geographic information science and systems*. John Wiley & Sons.

McKercher, B., Prideaux, B., & Thompson, M. (2025). The relationship between accommodation type and tourists' in-destination behaviour. *Tourism Recreation Research*, *50*(1), 14-23. https://doi.org/10.1080/02508281.2025.2465964

Prideaux, B. (2000). The role of the transport system in destination development. *Tourism Management*, *21*(1), 53-63. https://doi.org/10.1016/j.tourman.2025.105199

Udonwa, R. E., Eneyo, V. B., & Iyam, M. A. (2024). Effects of lifestyle factors on weight variations among adolescents in southern Cross River State, Nigeria. *Nigeria Journal of Home Economics*, *12*(10), 25-33. https://doi.org/10.61868/njhe.v12i10.303

Stabler, M. (2003). The economic evaluation of the role of conservation and tourism in the regeneration of historic urban destinations. In *Embracing and managing change in tourism* (pp. 269-296). Routledge.

Sunny, M. A. U. (2024). Unveiling spatial insights: navigating the parameters of dynamic Geographic Information Systems (GIS) analysis. *International Journal of Science and Research Archive*, *11*(2), 1976-1985. https://doi.org/10.30574/ijsra.2025.14.3.0590

Torre, A., & Scarborough, H. (2017). Reconsidering the estimation of the economic impact of cultural tourism. *Tourism Management*, *59*, 621-629. https://doi.org/10.1016/j.tourman.2025.105199

Valenzuela-Ortiz, A., Chica-Olmo, J., & Castaneda, J. A. (2025). Location factors and agglomeration economies in the hotel industry: The case of Spain. *European Journal of Management and Business Economics*, *34*(1), 1-22. https://doi.org/10.1108/EJMBE-03-2023-0084

Velaoras, K., Menegaki, A. N., Polyzos, S., & Gotzamani, K. (2025). The role of environmental certification in the hospitality industry: Assessing sustainability, consumer preferences, and the economic impact. *Sustainability*, *17*(2), 650. https://doi.org/10.3390/su152115303

Wan, T., Lu, W., & Sun, P. (2023). Equity impacts of the built environment in urban rail transit station areas from a transit-oriented development perspective: a systematic review. *Environmental Research Communications*, *5*(9), 092001. https://doi.org/ 10.1088/2515-7620/adc6dd

Yang, Y., Mao, Z., & Tang, J. (2018). Understanding guest satisfaction with urban hotel location. *Journal of Travel Research*, *57*(2), 243-259. https://doi.org/10.1177/00472875251322510

Inyang, I. (2022). Accounting ambiguities and earnings from electronic activities in commercial banks: Contemporary trends and implications. *Multi-Disciplinary Journal of Research and Development Perspectives*, *11*(2), 55 - 70

Inyang, I. (2022). Tax revenue and fiscal development: A pragmatic framework for economic governance in Cross River State, Nigeria. *Multi-Disciplinary Journal of Research and Development Perspectives*, *11*(2), 71 - 86

Inyang, I. (2023). Evaluating legal financial instruments and economic control in the public sector. *Nigerian Journal of Social and Development Issues*, *11*(1), 134–151.

Inyang, I. (2023). Fiscal management and organisational efficiency in public health institutions: An empirical study in Nigeria. *Nigerian Journal of Social and Development Issues*, *11*(1), 152–166.

Inyang, I. (2024). Impact of ethical behaviour on tax administration: An integrated perspective. *World Tourism Journal*, *2*(2), 124–139.

Inyang, I. (2024). Minimum public sector wages and financial asset retention during inflation: Evidence from Nigeria. *World Tourism Journal*, *2*(2), 140–155.

Omori, A. E., Unimna, F. A., Chuktu, O., Inyang, I., Effiom, V. N., & Emeka, J. (2025). Higher education administrators' leadership styles and academic workforce work performance in public universities. *International Journal of Educational Organization and Leadership*, *32*(1), 153 - 176