Spatial Analysis of Faith Based Locations in Ota, Ogun State, Nigeria

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Abstract

This study examines spatial distribution of faith based locations in Ota, Ogun State, Nigeria. Data used for the study were collected through questionnaire administration, the use of GPS and satellite imageries. Using accidental sampling technique, 321 questionnaires were administered. The data were analyzed using ArcGIS 10.2 software. There were 36 faith based locations in Ota, consisting of 24 churches, 8 mosques and 4 shrines/temples. The study showed that faith based locations is unevenly distributed. It was noted that the distributional pattern caused traffic congestion on worship days. Patrons travelled an average distance of a kilometer and above. It was discovered that the most important factors influencing the distributional pattern of faith based locations were cost of land and ease of getting transport. Influencing factor with the least FLDFI was traditions and culture. Concentric zone analysis shows that faith based locations were concentrated within the city centre and decreases inversely with distance from the city centre. Average Nearest Neighbor Analysis revealed that the pattern of faith based locations from the ANNA is clustered. The study revealed that large number of patrons, on-street parking, disobedience to traffic law and reckless driving of public transporter was asserted to be the major cause of traffic congestion on worship days. The study therefore recommends decentralization of faith base location.

Keywords: Faith Based Locations, GIS, Distribution, Spatial Pattern.

1. Introduction

Religion is an inescapable involvement of every member of human race. Whether directly or indirectly, every individual have follow and worship deity his mind chooses to adopt spiritually and physically. In other words, human beings are religious in the sense of what they believe in and are committed to one faith or the other. This accounts for the zeal with which different religion sect pursue their convictions vis-à-vis faith based locations [1]. Faith based locations, like many other geographic variables are spatially inclined and distributed across space in membership. The inequality in the distribution of such essential public facilities in urban areas has generated the need for movement of worshippers/people from one place to another in order to fulfill such basic religion obligation. This movement from places of residence to the faith based locations results to trip generation vis-à-vis travel patterns and behaviour.

People's needs are closely related with the social and economic interaction. People conduct activities in different places due to biological needs, social obligations, and personal desires [2]. Commonly many activities are done with variety of purposes, which are worshipping, working, education, recreation, and social activities. Analogous with time being, people's activities become more complex and also increase people movement. From this increase, people then tend to choose and determine which travel mode most suitable for them to fulfill these needs. Opportunity to choose the most suitable travel mode for every activity is more open and wider from the private transport to different kind of public transport. In addition, with the raise of individual's income, the need to buy and own private cars arise which invariably dictate and contribute to travel behavior in an area.

Faith based location and its activities have presented transport as a necessity for people and economic prosperity alike. The spatial distribution of these activities has made travel an essential part of their daily routine or living. Travel is derived from these activities that people wish to pursue. That is, religion obligation (in church services and mosques), implying that travel patterns can only be understood from such a broader perspective. The spatial distribution of such daily activities and increasing rate of car ownership are central to totality of distances travelled in time and space thereby resulting into the different residents' travel behavior in urban areas. Along this thought, [3] have pointed out that travel behaviour typically shows individual's travel characteristics in terms of mode choice (e.g. private car, public transport, or walking) and/or journey purpose (e.g. worshipping, commuting, shopping or leisure). Expectedly, different studies have been conducted on faith based locations. [4] examined the environmental effects of church proliferation: the redeemed church of God as case study. [5] analyze the impact of religious centres on traffic flow along Mowe-Ibafo axis of Lagos-Ibadan Express. [6] examined the location of worship centers on residential properties values in Ota, Nigeria. A close examination of previous studies shows that the spatial distribution of faith based locations has not been adequately investigated. There is therefore, need to suggest the study of spatial distribution of faith based locations in Ota. This study therefore

focused on analysis of spatial distribution of faith based locations in Ota, Ogun State, with a view to highlight its implications.

2. Literature Review

Religion, as a phenomenon of human concern, is perhaps the most complex, most involving, and yet the least comprehendible of all the disciplines within the humanities. Right from the dawn of human creation or evolution to the present age, man has been the only universally established and acknowledged being that has something to do with religion in terms of beliefs and practices. In other words man is the only religiously conscious being. Even when the existence of the Supreme Being cannot be substantiated by some people, the benefits of religion cannot be over emphasized. For instance, religion provides a 'unified system of beliefs and practices' [7], which determines society's morality. More than being what relates the individual to a 'higher being', religion is also the provider of set values that influence the way each individual relates to others and his or her behavior, in general [8]. Regular attendance at religious services is linked to healthy, stable family life, strong marriages, and well-behaved children [9]. The practice of religion could also lead to a reduction in the incidence of domestic abuse, crime, substance abuse, and addiction. In addition, religious practice leads to an increase in physical and mental health, longevity, and education attainment. Little wonder if generations pass these benefits to future coming ones by teaching the younger ones the ethos of their religion. Hence, religion is said to provide man with an identity [10].

The aforementioned has resulted to various nations establishing ways of communicating to a Supreme Being. Nigeria, for instance, can be seen as a nation that practices three major kinds of religion, Christianity, Islam, and the Traditional worship. Several other religions in Nigeria coexist, helping to accentuate regional and ethnic distinctions. All religions represented in Nigeria are being practiced all over the nation, but Islam is believed to be dominated in the north and held strong numbers in the southwestern, Yoruba part of the country. Protestantism and local syncretism Christianity are also evidence in Yoruba areas, while Catholicism predominates in the Igbo and closely related areas. Both Protestantism and Catholicism is also believed to be dominated amongst the Ibibios, Annang, and the Efik lands [6]. In a nutshell, Figure from the 1963 census indicated that 47 percent of Nigerians were Muslim, 35 percent Christian, and 18 percent members of local indigenous congregations. If accurate, this indicated a sharp increase in the number of Christians (up 13 percent); a slight decline among those professing indigenous beliefs, compared to 20 percent in 1953; and only a modest (4 percent) rise of Muslims. A religious survey, conducted in the country in 2009, puts the Figures as follows: 50.4%, 48.2% and 1.4% for Muslims, Christians, and Others, respectively [11]. Although, the proportion of Muslims is highest, the rise in the number of Christians over the years is evident. In order to match the astronomical rise amongst the Christian folks, there is evident proliferation of churches within the residential vicinity [6].

Recent observations has revealed that faith based locations (especially churches and mosques) have been making waves all over the continent today and, as a matter of fact, brought about unknown places to be well known in the community in which bare lands have been turned into worship centers in the residential area. For urban planners, the place of worship development has been an important area of adjustment and has also been an area of considerable land use conflict [6]. This situation is not far-fetched in the study area as there are envisaged congestion of traffic after service days and other special events, such as Holy Ghost, Shiloh and the various programs. This is perhaps a major concern to motorist, worshipers, and dwellers within and around the vicinity. Specifically, religious institutions generate a traffic volume that is comparable to those generated by residential uses on weekdays. However, on weekends, which are typically days of worship, the amount of traffic generated can be three to five times greater than its residential counterpart [12]. The issue of traffic hold up could lead to traffic robbery attack, noise pollution, and a health hazard from exhaust fumes within the vicinity. In other not to be delayed in meeting other appointments, worshipers could tend to leave services before closing time, resulting in adverse spiritual build up. These are issues that have probably warranted zoning of complementary land uses.

3. Methods and Materials

The study employed mainly primary data. The primary data were collected through field survey (identification of Faith based locations), The field survey enables the gathering of firsthand data and familiarity with the location of the Faith based Locations, collection of coordinates of geometric positions of faith based Locations using Global Positioning System (GPS), identification of the land use pattern around the faith based Locations, identification of various adjoining roads and streets linking each of the based Locations in the study area as well as the prevailing socioeconomic activities around each of the identified faith based Locations. Similarly administration of structured questionnaire was employed. The questionnaire was administered on the patrons of the thirty six (36) identified faith based locations in the study area. The reasons for such selection and restriction is that the previous studies [6] [4] revealed that this set of persons possess greater knowledge of issues

being investigated and therefore were able to respond satisfactorily to questions. The questionnaire consists of basic socio-economic characteristics of the worshippers; factors that influence spatial distribution of faith based locations, the socio-economic implications and possible mitigation measure. The population for the study consists of all the worshippers in the thirty six (36) major faith based locations identified Ota. It is important to note that the thirty six major faith based locations identified, have service capacity of three hundred and twenty one thousand and ten (321,010) persons. Each member of the population is either a patron of one of this faith based location or the other. The service capacity of the identified faith based locations were determined through reconnaissance survey and counting of the number of seat and seating arrangement of each of the denomination on service free days. Considering the large nature of the patrons' size, a sample of 0.1% which translated to 321 of the total patrons of the faith based location in Ota was sampled using accidental sampling techniques to serve as true representation of the whole population. The secondary sources on the other hand, provided various relevant information (published and unpublished) from articles, journals, maps, (such maps are; the analogue map of Ota which served as the base maps for the study, the land use, the administrative maps and also satellite imagery covering the area which was downloaded from Google earth pro 7.1 and rectified using the coordinates collected from the field with the GPS. This rectification was done using ArcGIS 10.2.1 software subsequently, different analysis such as concentric zone analysis and nearest neighbor analysis was run on the ArcGIS environment.

4. Results and Discussion

4.1 Spatial Location and Distribution of Faith Organisations in Ota

Table 1 shows the spatial distribution of faith based location in Ota. The inventory of faith based locations in the study area reveals that thirty-six (36) faith based locations were captured at the time of this research consisting of twenty four (24) churches, five (8) central mosques and four (4) shrines and temples. The GIS Average Nearest Neighbor Analysis carried out shows that faith based locations just like other geographical variables are unevenly

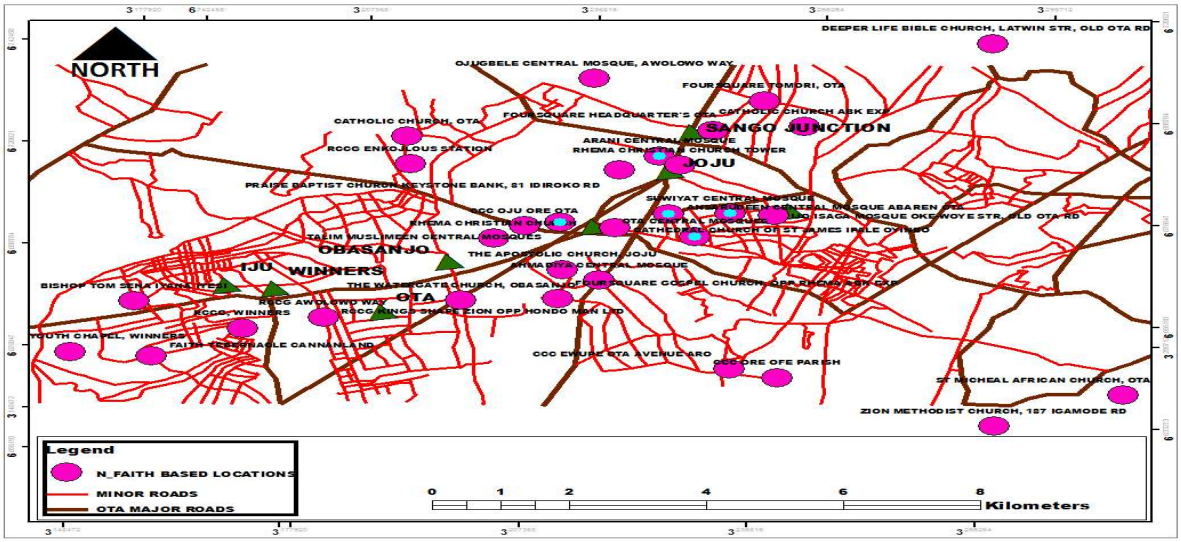

Figure 1: Spatial Location and Distribution of Faith Based Location in the Study Area
Source: Author's Fieldwork and Computation, 2018

distributed across space in Ado-Odo Ota Local Government Area of Ogun State (as shown in

figure 4.5). They concentrated majorly within central populated areas of Ota such as Joju area, Iju, Oju Ore, Obasanjo, Winner, Toll Gate and along major routes. This spatial distribution pattern is noted to be in response to series of locational factors such as; population threshold, accessibility, government policy, space availability and high patronage that support the existence of the faith based locations. The implication of this distributional pattern is the high tendency for traffic menace especially on some notable junctions on worship days since every patron will always set out to meet up with worship service thereby contributing to high traffic in excess of the carrying capacity of road. Table 1 shows the spatial distribution of faith based locations in the study area as well as their location in space.

Table 1: Spatial Location and Distribution of Faith Based Location in Ota

FID	Shape*	ID	Name	Latitude	Longitude
0	Point	0	Faith Tabernacle Canaan land	6.67149	3.16809
1	Point	0	Rhema Christian Church	6.6885	3.21688
2	Point	0	The WaterGate Church, Obasanjo	6.67633	3.2102
3	Point	0	Redeemed Christian Church of God, Awolowo Way	6.67575	3.19181
4	Point	0	The Apostolic Church, Joju	6.68058	3.22448
5	Point	0	Redeemed Christian Church of God, Enkojlous Station	6.7067	3.208884
6	Point	0	Foursquare Gospel church, Opp. Rhema ABK Express	6.67452	3.22281
7	Point	0	Deeper Life Bible Church, Latwin Street, Old-Ota, Road	6.71922	3.28873
8	Point	0	Iju Isaga Mosque, Oke-Woye Street, Old Ota, Road	6.6874	3.25385
9	Point	0	Ahmadiya Central Mosque	6.67747	3.22891
10	Point	0	Ojugbele Central Mosque, Awolowo Way	6.72083	3.23586
11	Point	0	Celestial Church of Christ, Ore-Ofe Parish	6.65248	3.24819
12	Point	0	Celestial Church of Christ, Ewupe, Ota, Avenue Aro	6.65548	3.24225
13	Point	0	Celestial Church of Christ, Oju-Ore, Ota	6.69084	3.22127
14	Point	0	Zion Methodist Church, 187 Igamode Road	6.6371	3.27447
15	Point	0	Catholic Church ABK Express	6.7069	3.26116
16	Point	0	Praise Baptist Church Keystone Bank 81, Idiroko Road	6.70063	3.23561
17	Point	0	Cathedral Church of St James, Ipale Oyinbo	6.68835	3.23288
18	Point	0	Winners Youth Chapel	6.67425	3.15771
19	Point	0	Redeemed Christian Church of God Kings Shape Zion, Opp. Ondo Man Ltd	6.67575	3.19181
20	Point	0	St Michael African Church, Ota	6.64083	3.2923
21	Point	0	Bishop Tom Sena, Iyana Iyesi	6.68364	3.1679
22	Point	0	Ansarudeen Central Mosque Baren, Ota	6.69004	3.24041
23	Point	0	Arani Central Mosque	6.70277	3.2483
24	Point	0	Suwiyat Central Mosque	6.6888	3.2483
25	Point	0	Talimmuslimeen Central Mosque	6.69084	3.226
26	Point	0	Ota Central Mosque	6.68468	3.24286
27	Point	0	Rhema Christian Church, Tower	6.70025	3.24367
28	Point	0	Redeemed Christian Church of God	6.67532	3.18093
29	Point	0	Catholic Church, Ota	6.71268	3.2094
30	Point	0	Foursquare Tomori, Ota	6.71214	3.25706
31	Point	0	Foursquare Headquarters, Ota	6.70697	3.24928

Source: Author's Fieldwork and Computation, 2018

4.2 Factors Responsible for Faith Based Location Distributional Pattern

Table 2 shows the factors that are responsible for faith based location distribution pattern in Ota. The aggregated data for factors responsible for faith based locations distributional pattern is presented in Table 4.2. From the findings, the mean Faith based Locations Distribution Factor Index (FLDFI) for Ota was 3.20. While the highest faith based locations Factor Index was 4.25, the lowest was 1.55. The most important factor influencing the distributional pattern of faith based locations as perceived by the patrons was cost of land and ease of getting transport. Influencing factor with the least FLDFI was traditions and culture. In addition, other influencing factors with high FLDFI in Ota as a whole were delay and traffic congestion, government regulations, accessibility, population of patrons, adjoining land-uses, availability of space and transport cost. Their respective FLDFI were 4.15, 3.99, 3.81, 3.71, 3.63, 3.58 and 3.53.

Table 2: Factors Responsible for Faith Based Location Distributional Pattern

Rank	Factors	SWV	FLDFI	DM
1	Cost of Land	1191	4.25	1.05
2	Ease of getting transport			
		1189	4.25	1.05
3	Delay & Traffic congestion	1163	4.15	0.95
4	Government Regulations	1118	3.99	0.79
5	Accessibility			
		1067	3.81	0.61
6	Population of Patrons			
		1038	3.71	0.51
7	Adjoining Landuses			
		1017	3.63	0.43
8	Availability of space			
		1003	3.58	0.38
9	Transport Cost			
		989	3.53	0.33
10	Tribe & Ethnicity			
		762	2.72	-0.48
11	Conditional Requirement of Site	746	2.66	-0.54
12	Nearness to Patrons			
		740	2.64	-0.56
13	Topography			
		532	1.90	-1.30
14	History			
		466	1.66	-1.54
15	Culture & Tradition			
		435	1.55	-1.65
	Mean			
			3.20	

Source: Author's Fieldwork and Computation, 2018.

Five other influencing factors with the least FLDFI were tribe and ethnicity (FLDFI=2.72), conditional requirement of site (FLDFI=2.66), nearness to patrons (FLDFI=2.64), topography (FLDFI=1.90) and history (FLDFI=1.66). See table 4.6 for the level of significance of each of the identified factors.

4.3. Concentric Zone Analysis and Nearest Neighbor Analysis of Faith based Locations in Ota

Figure 2 shows the concentric zone analysis of the faith based locations in Ota. This analysis revealed that faith based locations are concentrated within the same area and reduces with inverse progression outside the city centre while the suburb settlement have relatively few record of such faith based locations. This implies that the central area where the faith based are concentrated will always witness traffic congestion since the faith based location are not decentralized but located in the same geographical terrain. Similarly, Figure 4.4 shows the summary of the Average Nearest Neighbor Analysis carried out. The Observed Mean Distance is 924.0892 Meters, while the Expected Mean Distance is 1033.2469 Meters. Therefore the Nearest Neighbor Ratio is 0.894355. The pattern of faith based locations from the ANNA is clustered and given the z-score there is less than 10% likelihood that this clustered pattern could be as result of random chance. This pattern posed a great threat to the traffic flow in the study area

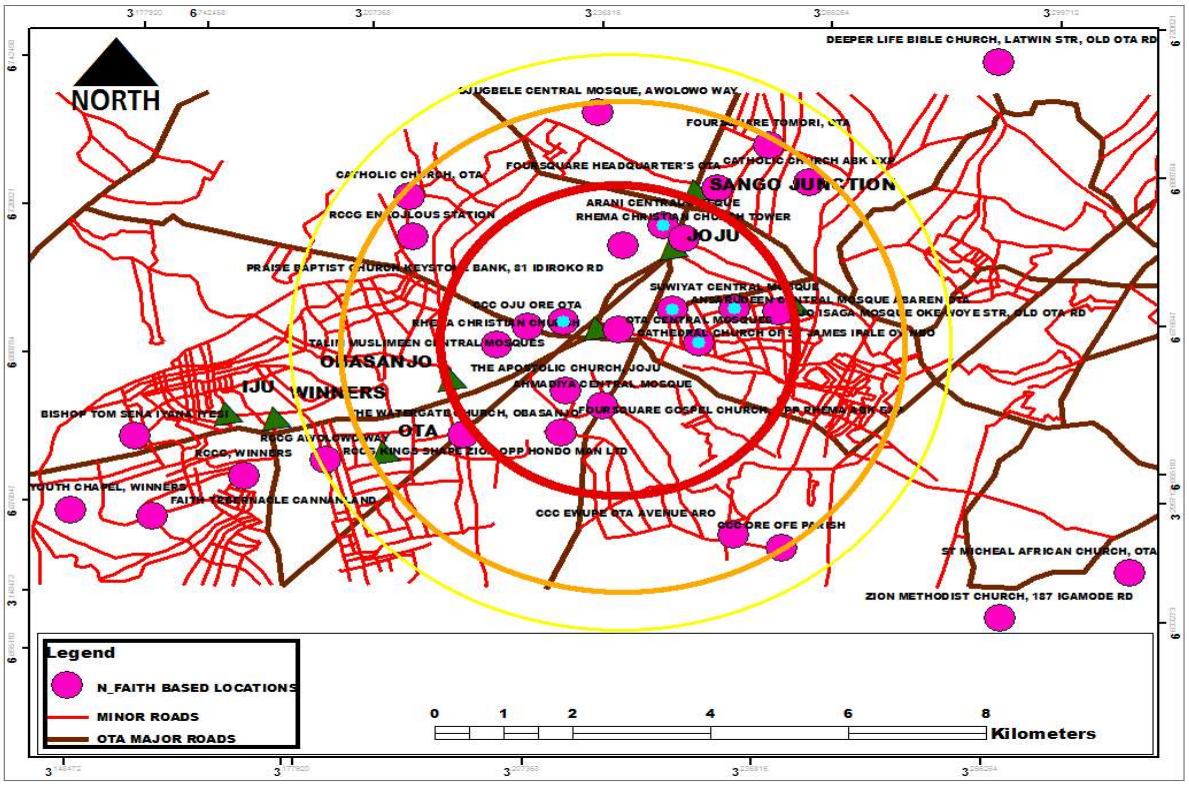

Figure 2: Concentric Zone Analysis of Faith Based Location in the Study Area

Source: Author's Fieldwork and Computation, 2018.

Average Nearest Neighbor Summary

Observed Mean Distance:	924.0892 Meters
Expected Mean Distance:	1033.2469 Meters
Nearest Neighbor Ratio:	0.894355
z-score:	-1.143289
p-value:	0.252919

Dataset Information

Input Feature Class:	N_FAITH BASED LOCATIONS
Distance Method:	EUCLIDEAN
Study Area:	136652680.845506
Selection Set:	False

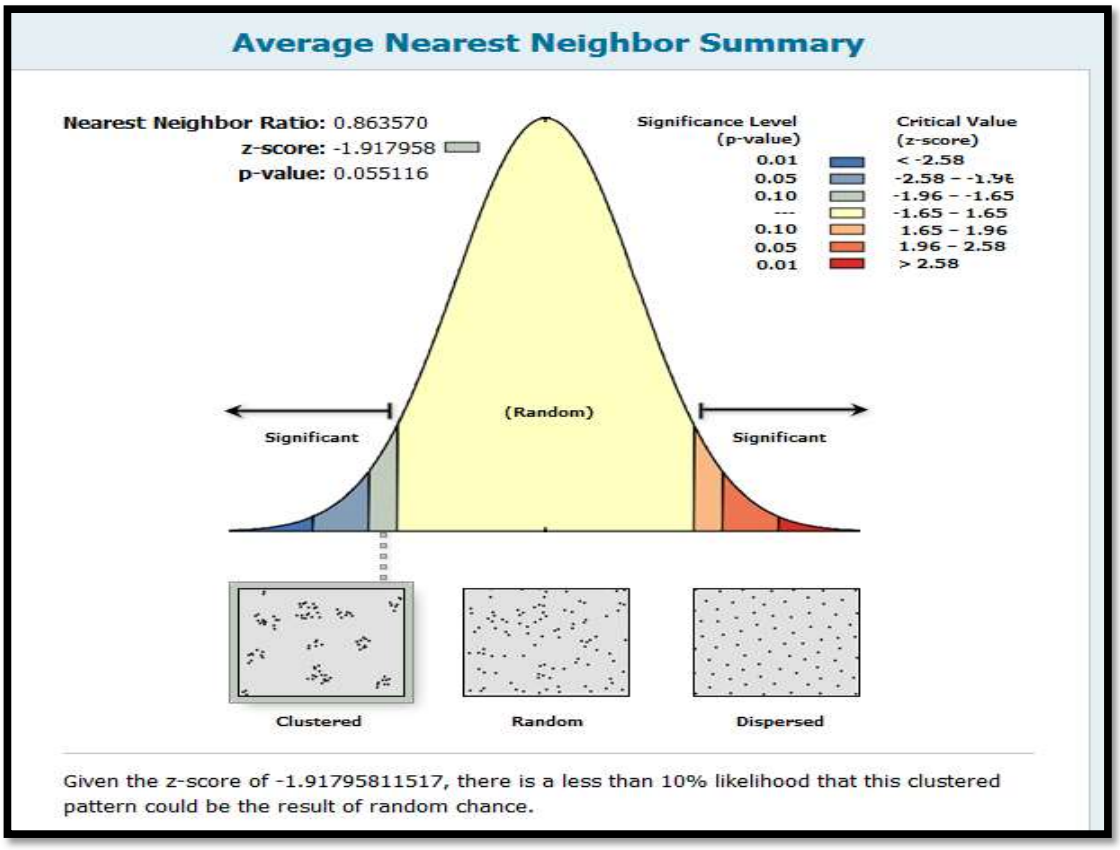

Figure 3: Nearest Neighbor Analysis of Faith Based Location.
Source: Author's Fieldwork and Computation, 2018

4.4 Average Distance from Place of Residence to the Faith Based Location

Figure 5 shows the average distance from place of residence of faith based patrons to their individual faith based locations in the study area. Forty nine point six percent (49.6%) of the sampled faith based patrons affirmed that the average distance from their place of residence to the faith based location is less than 1kilometer, those that asserted that the average distance is between 1-5km accounts for 6.8%, while 8.6% of the sampled patrons opined that the average

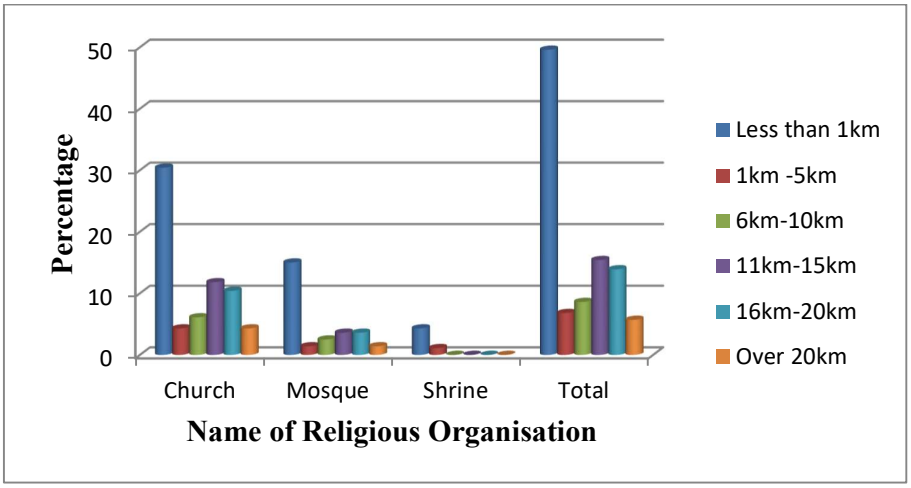

Figure 5 Average Distance from Place of Residence to the Faith Based Location

Source: Author's Fieldwork and Computation, 2018

distance from their residence to the faith based location is between 6-10km, 15.4% of the sampled faith based patrons asserted that the average distance between their residence and faith based locations is between 11-15km while 13.9% attested that the average distance is between 16-20km. it could be established that 5.7% of the patrons covers distance which is above 20km. From the analysis it was observed that the average distance between the residence of the majority (49.6) of the faith based patrons and their faith based location is between one kilometer above, since this distance is more than a trek able distance most of the patrons will always require a mobility and increase in mobility invariably increase traffic congestion on worship days. And considering the GIS-analysis carried out in this study, which shows that the distribution pattern is concentrated within the central radius of the study area. The implication of this will always be high traffic rancor within the central areas of Ota especially when the faith based patrons set out the same time as they will on worship days in order to meet up with services on the worship days.

5. Conclusion and Recommendations

This paper evolved out of contemporary need to analyze the spatial distribution of faith based locations in Ota. This has consequently brought to limelight some fundamental issues that may be of great importance to planners and those charged with the responsibility of regulating the activities of faith based locations in Ota as well as subsequent researchers.

Findings revealed that thirty-six (36) faith based locations were captured at the time of survey, consisting of twenty six (24) churches, eight (8) central mosques and four (4) shrines and temples. It was further observed that faith based locations just like any spatial variables are unevenly distributed across space in Ota. They are major concentrated within central populated areas of Ota such as Joju area, Iju, Oju Ore, Obasanjo, Winner, and Toll Gate and along major routes. The spatial distribution pattern is noted to be in response to series of locational factors such as; population threshold, accessibility, power supplies, government policy, space availability and high patronage that support the existence of the faith based locations.

The study further revealed that the distributional pattern have mostly resulted to traffic congestion especially on the worship days since every patron will want to ensure that they get to their faith based locations in time so as to meet up with worship service. This usually led to high traffic rancor due to traffic flow which is in excess of the carrying capacity of road. The study similarly revealed that the most important factor influencing the distributional pattern of faith based locations as perceived by the patrons was cost of land and ease of getting transport. Influencing factor with the least FLDFI was traditions and culture.

The study showed from the concentric zone analysis that faith based locations are concentrated within the same area (city centre) and reduces with inverse progression outside the city centre while the suburb settlement have relatively few record of such faith based locations. Similarly, the summary of the Average Nearest Neighbor Analysis carried out. The Observed Mean Distance is 924.0892 Meters, while the Expected Mean Distance is 1033.2469 Meters. Therefore the Nearest Neighbor Ratio is 0.894355. The pattern of faith based locations from the ANNA is clustered and given the z-score there is less than 10% likelihood that this clustered pattern could be as result of random chance. The clustered nature of faith based locations in the study area therefore posed a great threat to the traffic flow in the study area. Furthermore, the study revealed that Churches are the most pronounced type of faith based location in Ota when compared with any other faith based locations and most of this faith based locations are first generation faith based locations and their rate of increment have pose tremendous influence on the patrons travel behavior in the study area.

In the recent time, environmental effects of proliferation of faiths based location (religion centres) continued to be a major concern to all and particularly those in the mainstream of environmental protection. So disturbing has it become that analysts begin to think of the need for a legal framework to tackle the menace [6]. Considering the reckless use of land vi-a-vis the various environmental menaces associated with faith based activities (such as traffic congestion, delay, noise etc) in the study area environmental sustainability become non-negotiable. The following recommendations are therefore suggested; since most of the faith based locations are found to be clustered within the study area, government should with full force ensure decentralization of faith based location especially to the suburbs so as to reduce the traffic rancor usually experienced on worship days. This is possible through certain policy formulation and implementation like imposition of heavy tax on faith based locations in the city centres while giving tax holiday to those at the suburb. Proper land use zoning should be adopted so as to get rid of faith based locations from the residential areas. That is, government should revisit laws governing sitting of faith based locations. Government should set up a task force to check mate the unjust set up of faith based location in the city centers.

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