ANALYSIS OF THE SPATIAL PATTERNS OF SECONDARY SCHOOLS IN THE SENATORIAL ZONES OF BENUE STATE, NIGERIA

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Abstract
This research studied the spatial patterns of secondary schools in selected parts of Benue state with the aim of identifying the pattern of distribution of secondary schools and its implications in the state. The objectives of the study were to establish spatial patterns and assess spatial relationships. The study adopted field observation and measurement to obtain the needed data. GIS and inferential statistical techniques were employed to map, visualize and analyze the data. In Logo Local Government Area, the Nearest Neighbour Index (NNI = 0.533139) is higher than the Z-score value (-3.893099). The implication is clustering of schools in the area. In Gboko Local Government Area, the Nearest Neighbour Index (NNI = 0.700016) was higher than the Z-score value (-5.165005). This also implies that the schools in the area are clustered. In Obi Local Government area, the Z-score value (1.191313) was higher than the Nearest Neighbour Index (NNI = 1.146777). This implies that there is a dispersion pattern of schools' distribution in the area. The result showed a randomly distributed pattern of the schools in the area. The distribution turned towards clustering in Logo and Gboko Local Government Areas and towards dispersion in Obi Local Government Area. It is recommended that further research be conducted on the use of GIS for schools mapping and to create a database that can easily be updated at desirable intervals to cover the entire state for effective and efficient decision making.

Keywords: GIS, GPS, Coordinates, Database, Pattern

INTRODUCTION
The study of regional variations in the distribution of social services has captured the interest of geographers, planners and other scientists because of their general interest in the spatial variation of phenomena on the earth's surface (Sani, 2010). These services include; transportation, banking, industrialization, education, commerce, tourism, and hospitality. In this study, education is of major interest among these services. Education is one of the most promising paths for individuals to realize better and more productive lives and as one of the primary drivers of national economic development (Akpan and Njokwu, 2013). In Benue state, the spatial distribution of public educational facilities has been greatly influenced by political, economic and social factors (Eze, 2010). The resultant effect of these influences is that, the more populated urban centres attract more schools than their less populated rural counterparts. The schools are therefore clustered in the urban centres and dispersed in the rural areas. Consequently, the urban centres are favoured with educational opportunities at the expense of their rural counterparts.

Regardless of the above, one aspect of access to rural services that remains relatively under-researched in Nigeria at large and Benue State in particular is the distribution and accessibility to secondary schools (Olawole *et al*. 2015; Eze, 2010; Fabiyi and Ogunyenmi, 2015).

Similarly, among the many scholarly works that have been done on secondary schools in Benue state and reviewed for this study, none has been found by the authors to either specifically addressed the spatial distribution of secondary schools in the area using GIS techniques or mapped their spatial locations (Abenga, 1995; Ada, 2005; Tsavga 2011; Odeh, Oguche & Iyagher, 2015). This has limited the possibility of making significant and valid assessment of the nature and dynamics of the spatial patterns of schools in the area. From the reviewed works, it is apparent that the little or no studies on the spatial pattern of distribution of Secondary schools in Benue state, especially with a GIS focus, have been published. This study

becomes necessary because of these reasons. Consequently, this study attempts to fill this gap by identifying and mapping the spatial patterns of secondary schools in selected parts of Benue state with the view to identify the pattern of distribution of secondary schools and its implications in the state.

MATERIALS AND METHODS
Study Area
Logo, Gboko and Obi Local Government areas (LGAs) are located in Benue State, which is in the central middle belt of Nigeria. Logo LGA is located on latitude 7°40' N and longitude 9°40' E. Gboko LGA is located on latitude 7° 08' N and longitude 8° 50' E; and Obi LGA lies on latitude 7°01' N and longitude 7°41' E.
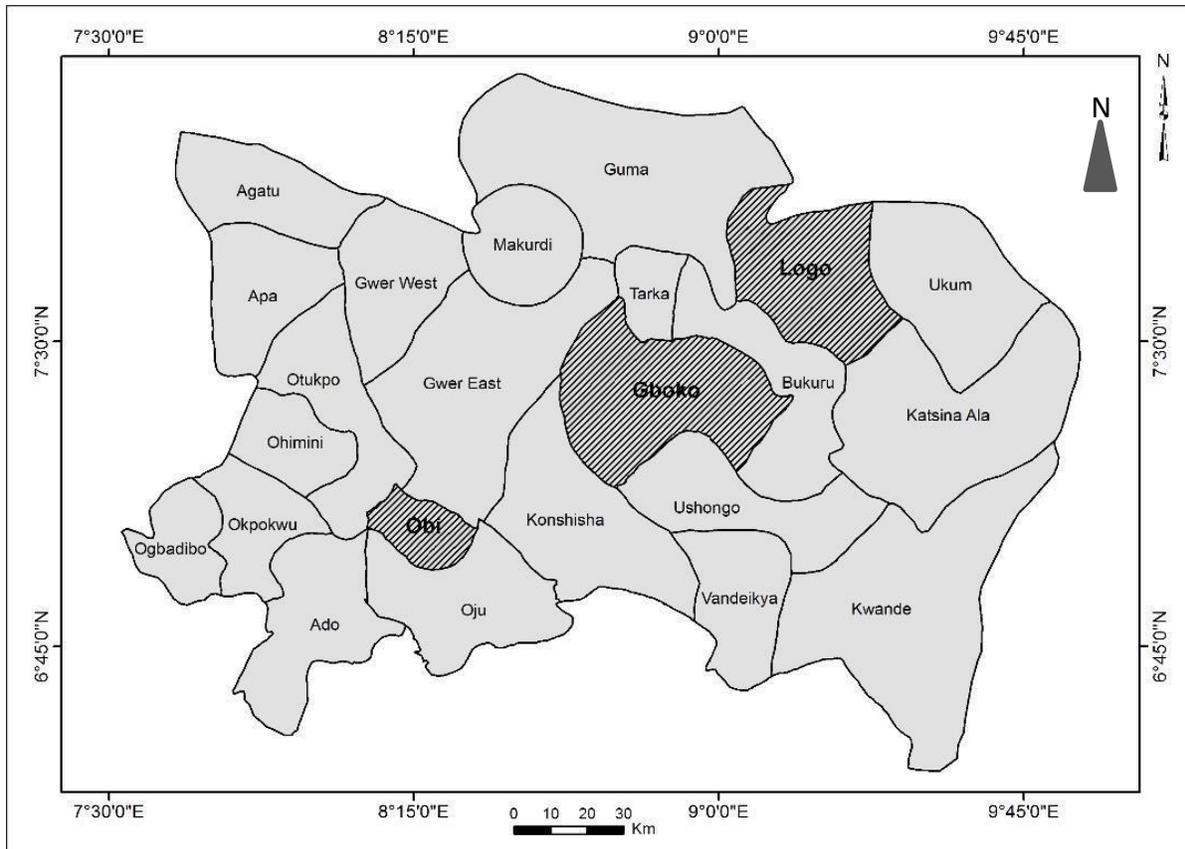

Figure 1 Benue State showing LGAs and the Sampled LGAs

Logo, Gboko and Obi cover land areas of about 1388.908km^2, 183.405 km^2 and 397.016 km^2 respectively. The climate of the area is of the tropic wet and dry climate (Aw) according to Koppen classification scheme.

The State is made up of built up areas like Gboko with high concentration of people and rural areas like Obi with relatively low concentration of people (Kwaghga, 2006). Dense population exists in Gboko LGA while Logo and Obi LGAs are moderately and less moderately populated respectively. The nature of the land use in the area varies from one part to another. It is either residential, industrial, commercial, educational, agricultural or open space areas. The heavily built up areas are considered as high density residential areas like Gboko LGA; moderately built up areas are considered as medium density residential areas like Logo LGA and fairly built up areas are low density residential areas like Obi LGA.

Methods of Data Collection
The methods used in this study include field observation, measurement, and interviews. Personal interviews were used to obtain data from

the concerned government ministries, educational institutions, students, traditional leaders and the inhabitants of the districts. The interview was carried out specifically to get information on secondary schools: their locations, ownership, and registration status with the state's Ministry of Education, and enrolment statistics.

The target population for this study were the secondary schools in the study area. The sampling procedure was multi-staged. First, a stratified sampling technique was used for this study because membership of each stratum was mutually exclusive. Secondly, a simple random sampling technique, used to select one Local Government in each stratum. Thirdly, the stratified random sampling technique was used to subdivide the Local Government areas into districts. There are thee Area Education Zones that cover the 23 LGAs in Benue state: 7 LGAs in Zone A; 7 LGAs in Zone B; and 9 LGAs in Zone C. One LGA was randomly selected from each zone: Logo in Zone A; Gboko in Zone B; and Obi in Zone C. Finally, all the Government owned, grant aided and approved schools in each of these 3 LGAs were engaged for data collection. Thus, 19 schools in Logo LGA, 83 in Gboko LGA and 18 in Obi LGA (table 1) were used in this study. Gboko LGA has a relatively large number of schools probably because it is an urban LGA, with a large population size compared with the other two.

Table 1 Database of secondary schools in the three local government areas

SN	LGA	DISTRICT	NAME OF SCHOOL	CATEGORY	OWNER	X	Y
01	Logo	Mbanym	Govt. Comprehensive Sec	Grant Aided	Government	0539808	0829983
02	Logo	Mbagbev	Govt. Sci & Tech. College	Grant Aided	Government	0527498	0863726
03	Logo	Mbatee	Ugondo Community Sec. Sch	Grant Aided	Community	0537960	0831035
04	Logo	Tombo	Tombo Community Sec. Sch	Grant Aided	Community	0513535	0858930
05	Logo	Mbagbev	Gaambe Tiev Community	Grant Aided	Community	0527192	0862234
06	Logo	Mbavuur	Mbavur Community Sec. Sch	Grant Aided	Community	0536046	0852954
07	Logo	Mbanyam	All Saints Catholic Sec. Sch	Grant Aided	Mission	0537303	0829332
08	Logo	Mbagbev	Unity Sec. Sch	Approved	Individual	0529707	0857688
09	Logo	Mbanyam	NKST sec. sch	Grant Aided	Mission	0538028	0830148
10	Logo	Mbanyam	Voice of the Cross College	Approved	Individual	0538194	0829173
11	Logo	Yonov	No Secondary Schools				
12	Logo	Mbavuur	Imaculate Conception Sec.	Approved	Individual	0534294	0851914
13	Logo	Mbavuur	Gender Foundation College	Approved	Individual	0534059	0852595
14	Logo	Mbagbev	Mandate Sec. Sch.	Approved	Individual	0527247	0862495
15	Logo	Mbagbev	Anyiin Children Sec. Sch	Approved	Community	0527584	0864280
16	Logo	Mbagbev	St. John's Anglican Sec. Sch	Approved	Mission	0526981	0865298
17	Logo	Tswarev/	Tswarev Comprehensive Sec.	Approved	Community	0541776	0867175
18	Logo	Mbagbev	Upsed Grammar Sch	Approved	Individual	0526760	0863038
19	Logo	Tswarev/	Ukemberagya Comm. Sch	Approved	Community	0533518	0865960
20	Logo	Mbaagbev	Prince Victor Sec. Sch	Approved	Individual	0526237	0865340
21	Logo	Nenzev	No Secondary Schools				
22	Logo	Turan	No Secondary Schools				
23	Logo	Mbadyuu	No Secondary Schools				
24	Gboko	Township	Govt. Sec. Sch.	Grant Aided	Government	0501124	0809293
25	Gboko	Township	Govt. Day Sec. Sch. Buter	Grant Aided	Government	0500630	0813281
26	Gboko	Township	Queen of the Rosary Sec Sch.	Grant Aided	Mission	0499714	0810358
27	Gboko	Township	St. Johns Day Sec. Sch.	Grant Aided	Mission	0499677	0810257
28	Gboko	Township	Commercial College	Grant Aided	Individual	0502788	0812203
29	Gboko	Township	W.M Bristow Secondary Sch	Grant Aided	Mission	0500038	0810892
30	Gboko	Township	Gboko High School	Grant Aided	Individual	0500826	0807764
31	Gboko	Township	National College	Grant Aided	Individual	0501883	0812813

Table 1 Contd

SN	LGA	DISTRICT	NAME OF SCHOOL	CATEGORY	OWNER	X	Y
32	Gboko	Township	Tofi Memorial College	Grant Aided	Individual	0503407	0812440
33	Gboko	Township	Anglican Sec. Sch.	Approved	Mission	0500518	0808943
34	Gboko	Township	Chiandy International Sec.	Approved	Individual	0497796	0811240
35	Gboko	Township	Day Spring Academy	Approved	Individual	0498580	0813152
56	Gboko	Township	Divine Progressive College	Approved	Individual	0496135	0807865
37	Gboko	Township	Excellent International Coll	Approved	Individual	0497914	0809554
38	Gboko	Township	Gboko International College	Approved	Individual	0499553	0812225
39	Gboko	Township	Glory College	Approved	Individual	0497470	0812382
40	Gboko	Township	Great Bethel Int'l College	Approved	Individual	0500981	0812113
41	Gboko	Township	Holy Child Academy	Approved	Individual	0498447	0806329
42	Gboko	Township	Independence Science Coll	Approved	Individual	0497897	0807147
43	Gboko	Township	Kimota Science College	Approved	Individual	0498924	0810134
44	Gboko	Township	Kwaghkohol Royal College	Approved	Individual	0497870	0807907
45	Gboko	Township	Malamin Sec. Sch.	Approved	Individual	0497615	0810607
46	Gboko	Township	Mbayion Comprehensive Coll	Approved	Individual	0497932	0809133
47	Gboko	Township	Mektan International College	Approved	Individual	0501731	0812638
48	Gboko	Township	Mfaterdoo College	Approved	Individual	0498145	0809617
49	Gboko	Township	National Evangelical Mission	Approved	Mission	0498735	0808897
50	Gboko	Township	PA- Andiir Science College	Approved	Individual	0498979	0809900
51	Gboko	Township	Prisons Secondary School	Approved	Government	0499723	0809626
52	Gboko	Township	Rhema International College	Approved	Individual	0501127	0812072
53	Gboko	Township	Rutula Secondary School	Approved	Individual	0497826	0806800
54	Gboko	Township	St. Edward College	Approved	Individual	0501965	0810427
55	Gboko	Township	St. John Model College	Approved	Individual	0498353	0812168
56	Gboko	Township	Unique Secondary school	Approved	Individual	0502000	0807470
57	Gboko	Township	Uplift Secondary School	Approved	Individual	0501102	0810586
58	Gboko	Township	Victory Secondary School	Approved	Individual	0501899	0807767
59	Gboko	Township	Mbayion International Coll	Approved	Individual	0498876	0809431
60	Gboko	Township	Akpuur College Gboko	Approved	Individual	0495812	0808015
61	Gboko	Mbatyu	Mbaakpough Community Sec	Approved	Community	0495499	0822413
62	Gboko	Mbatser	Yion Day Secondary School	Approved	Community	0490770	0816228
63	Gboko	Ukpekpe	Akiishi School Generale Amu	Approved	Individual	0499824	0817557
64	Gboko	Ukpekpe	NKST Secondary School	Approved	Mission	0499656	0817040
65	Gboko	Mbatser	Zenda memorial College	Approved	Individual	0496178	0811873
66	Gboko	Mbatan	Immanuel Model College	Approved	Individual	0493565	0806700
67	Gboko	Ukpekpe	Amua Grammar College	Approved	Individual	0499495	0817744
68	Gboko	Mbatan	Calvary Arrows College	Approved	Mission	0488030	0805660
69	Gboko	Mbatan	El-terald Comprehensive Coll	Approved	Individual	0490147	0805514
70	Gboko	Mbatan	Kings Model College Igyura	Approved	Individual	0488380	0804956
71	Gboko	mbatser	Mbaanyam Commnity Sec.	Approved	Community	0493960	0814449
72	Gboko	Mbatan	Mbamtegh commnty Sec. sch.	Approved	Community	0485292	0813357
73	Gboko	mbatyu	Mbatyura Progressive College	Approved	Community	0496232	0821534
74	Gboko	Mbadim	Mbaanaambe Commty Sec	Grant Aided	Community	0462257	0806686
75	Gboko	Mbaavara	Mbaityav Community Sec	Grant Aided	Community	0477080	0819751
76	Gboko	Mbaanku	Mbasugh Community Sec Sch	Grant Aided	Community	0458943	0816493
77	Gboko	Mbadim	St. Veronica Sec. Sch. Agidi	Grant Aided	Mission	0474356	0807985
78	Gboko	Mbadim	NKST Sec. Sch. Kuhe	Grant Aided	Mission	0476635	0806377
79	Gboko	Mbaanku	Chamagu Sec Sch Tyoado	Approved	Individual	0464907	0824314

Table 1 Contd

| SN	LGA	DISTRICT	NAME OF SCHOOL	CATEGORY	OWNER	X	Y
80	Gboko	Mbadim	Mbatyav Sci. and Tech. Coll.	Approved	Individual	0478610	0806440
81	Gboko	Mbadim	Ngumem College Akpagher	Approved	Individual	0475811	0807647
82	Gboko	Mbaavara	NKST Sec. Sch. Gbemacha	Approved	Mission	0476743	0820405
83	Gboko	Mbaavara	St. Anthony Sec. School	Approved	Mission	0475872	0820245
84	Gboko	Utabar	Yandev Community Sec. Sch.	Grant Aided	Community	0507434	0817138
85	Gboko	Utabar	St. James Junior Seminary	Grant Aided	Mission	0502745	0814816
86	Gboko	Mbaiwar	Mbawar Community Sec.	Approved	Community	0507736	0822477
87	Gboko	Utabar	Kusaki College Yandev	Approved	Individual	0504226	0813290
88	Gboko	Mbakwen	Govt. Secondary School Ikpa	Grant Aided	Government	0474116	0831185
89	Gboko	Mbakwen	Mbatierev community Sec.	Grant Aided	Community	0477710	0831685
90	Gboko	mbakwen	Uavande Community Sec.	Grant Aided	Community	0472826	0840409
91	Gboko	Mbadam	No Secondary Schools				
92	Gboko	Mbakpegh	Ipav Community Sec., Kyu	Grant Aided	Community	0512730	0809710
93	Gboko	Mbakpegh	NKST Sec. Sch. Mkar	Grant Aided	Mission	0505438	0809142
94	Gboko	Mbakpegh	NKST College Mkar	Grant Aided	Mission	0504495	0811084
95	Gboko	Mbakpegh	CDM Academy Mkar	Approved	Mission	0505634	0807564
96	Gboko	Mbakpegh	Creativity Sec. Sch. Meladu	Approved	Individual	0509628	0811080
97	Gboko	Igyorov	Dimtor Sec. Sch. Adewaka	Approved	Community	0516644	0806913
98	Gboko	Mbakpegh	Excelgrace Sec. Sch Akaajime	Approved	Individual	0502615	0809612
99	Gboko	Mbakpegh	Jerusalem Academy Akaajime	Approved	Individual	0502176	0808755
100	Gboko	Mbakpegh	Mkar Model College Mkar	Approved	Individual	0504295	0810718
101	Gboko	Mbakpegh	Graceland Sec. Sch. Akaajime	Approved	Individual	0502250	0809400
102	Gboko	Mbakpegh	Notredam Sec. Sch. Mkar	Approved	Individual	0505012	0808020
103	Gboko	Mbakpegh	Princess Adeja Sec. Sch.	Approved	Individual	0502319	0809842
104	Gboko	Mbakpegh	Sky Gifted Sec. Sch. Mkar	Approved	Individual	0503967	0809650
105	Gboko	Mbakpegh	Takema Memorial Sec. Sch.	Approved	Individual	0503014	0808904
106	Gboko	Mbakpegh	Trinity College Akaajime	Approved	Individual	0502424	0808305
107	Gboko	Mbapegh	Ukough Community Sec. Sch.	Approved	Individual	0516255	0818107
108	Obi	Obarike	St. Joseph Sec. Sch. Ito	Grant Aided	Mission	0425813	0777240
109	Obi	Okwutung	Govt. Girls Sec. Sch. Obarike	Grant Aided	Government	0427545	0777523
110	Obi	Itogo	Itogo Community High Sch. Ek	Approved	Community	0429602	0780668
111	Obi	Itogo	Christ Apostolic Church Sec	Approved	Mission	0430184	0783903
112	Obi	Adiko	Adiko Community Sec. Sch.	Approved	Community	0431396	0773922
113	Obi	Obeko	Adum Community Sec. Sch	Approved	Community	0430421	0767604
114	Obi	Irabi	No Secondary Schools				
115	Obi	Orihi	Soled Sec. School Ohum	Approved	Individual	0426888	0766497
116	Obi	Ogore	Govt. Secondary School Ito	Grant Aided	Government	0426410	0772468
117	Obi	Adum	Methodist High school Adum	Grant Aided	Mission	0422715	0769714
118	Obi	Ikwokwu	Oluwu Onwaji Memorial Sec.	Approved	Individual	0423568	0772504
119	Obi	Ogore	Holy Trinity Anglican Coll	Approved	Mission	0426696	0774413
120	Obi	Obarike	Ede Peter Memorial Academy	Approved	Individual	0425850	0774978
121	Obi	Obarike	De-Patrick Comprehensive	Approved	Individual	0424330	0775420
122	Obi	Odiapa	No Secondary Schools				
123	Obi	Ikwokwu	St. Marks Secondary Sch. Ugba	Grant Aided	Mission	0417165	0776923
124	Obi	Okpokwu	Anglican Secondayr School Ita	Approved	Mission	0413845	0777883
125	Obi	Okpokwu	Emmanuel Hill Top Sec. Sch.	Approved	Individual	0412255	0772347
126	Obi	Okpokwu	Itogo Community High Sch.	Grant Aided	Community	0412893	0780727
127	Obi	Okpokwu	Royal Pride Academy Opirikw	Approved	Individual	0412081	0782907

Source: Researchers' field work

ArcGIS was used to produce map of Benue State showing all the local Government areas. The school coordinates were imported into the maps. The GPS coordinates were further used to create database of the schools by Local government areas. Nearest Neighbour Analysis was done in ArcGIS to establish the pattern of the schools in the areas.

RESULTS AND DISCUSSION
Pattern of Secondary Schools in Logo Local Government Area in Zone A
The GIS analysis carried out identified nineteen (19) secondary schools in Logo Local Government Area. Proximity analysis was carried out on the secondary schools using the Euclidean distance method. It revealed a range of 2305m (2.305km) to 4323m (4.323km) apart from each other secondary school in the area. The result of the Nearest Neighbour Statistics (NNS = 0.533139) reveals that secondary schools in Logo Local Government Area were randomly distributed (figure 2). The Nearest Neighbor Index implies that the pattern is turning towards clustering. The Nearest Neighbour Index (NNI = 0.533139) is higher than the Z-score value (-3.893099).
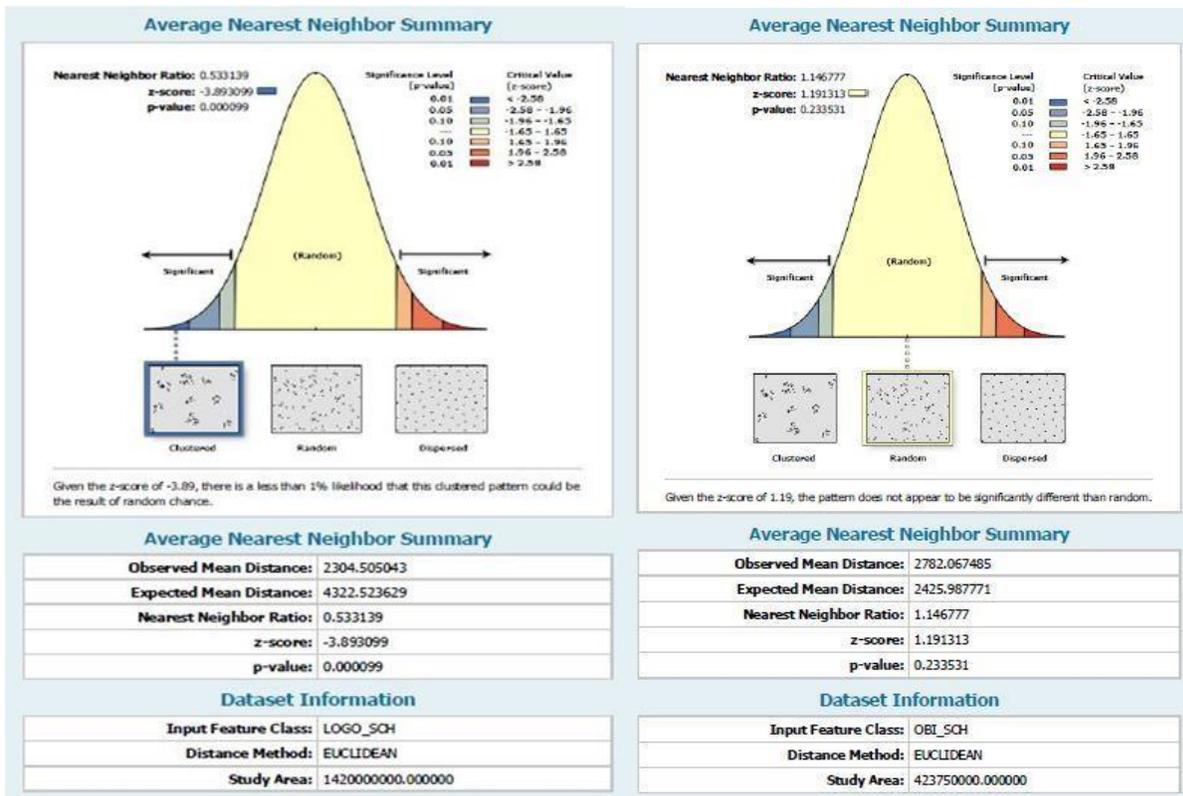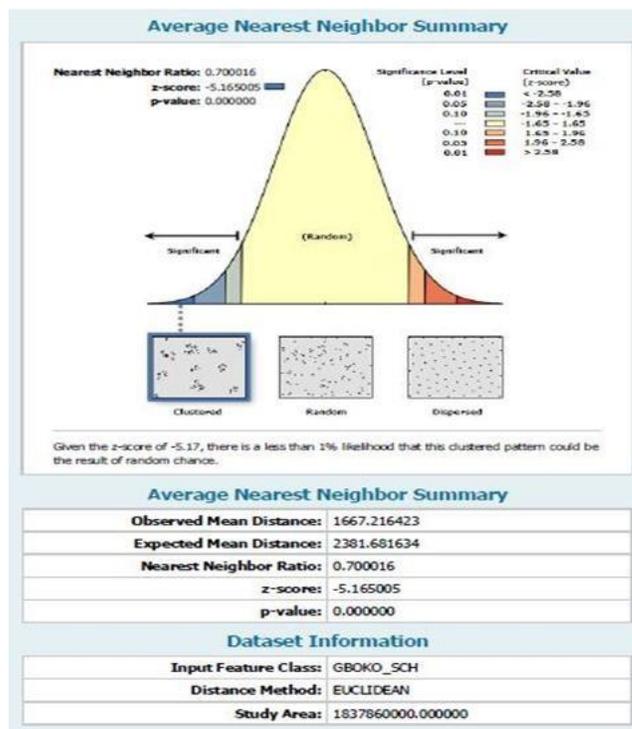
Figure 2 Nearest Neighbour Statistics for Logo, Gboko and Obi LGAs

This confirms that the schools were unevenly distributed. Several reasons can be adduced for this pattern of distribution of secondary schools. This may include the population distribution, relief and even government policies.

Pattern of Secondary Schools in Gboko Local Government Area in Zone B

The GIS analysis carried out identified eighty-three (83) secondary schools in Gboko Local Government Area. Proximity analysis was carried out on the secondary schools using the Euclidean distance method. It revealed an average of 1667m (1.667km) to 2362m (2.383km) apart from each other secondary school in the area. The result of the Nearest Neighbour Statistics (NNS = 0.700016) reveals that secondary schools in Gboko Local Government Area were randomly distributed (figure 2). The Nearest Neighbor Index also indicated that the pattern was turning towards clustering. The Nearest Neighbour Index (NNI = 0.700016) was higher than the Z-score value (-5.165005), implying an uneven distribution. This

pattern of schools' distribution was observed to have resulted from the influence of some of the major stakeholders to secondary education in the local government area, especially the private individuals and the missions who have many schools located in the urban areas based on their discretion. In the rural areas, it is mostly influenced by the communities and government policies. Other factors that affect the pattern of schools' distribution in the area are population distribution pattern, population size, population structure, especially in the rural areas and government policies.

Pattern of Secondary Schools in Obi Local Government Area in Zone C

The GIS analysis carried out identified eighteen (18) secondary schools in Obi Local Government Area. Proximity analysis was carried out on the secondary schools using the Euclidean distance method. It revealed an average of 2426m (2.426km) to 2782m (2.782km) apart from each other secondary school in the area. The result of the Nearest Neighbour Statistics (NNS = 1.146777) reveals that secondary schools in Obi Local Government Area were randomly

distributed (Figure 2). Nearest Neighbor Index indicated that the pattern tended towards dispersion. The Z-score value (1.191313) was higher than the Nearest Neighbour Index (NNI = 1.146777) showing that the schools were scattered across the area. This pattern of distribution was influenced by the interest of the people in education and development.

The study revealed that the secondary schools were randomly distributed across the Local Government Areas, turning towards clustering in Logo and Gboko Local Government areas. The situation is slightly different in Obi Local Government Area where the distribution turns towards dispersion (Figure.3). This means that most of the available schools were clustered in few specific locations within Logo and Gboko Local Government Areas, leaving the remaining few others dispersed on the wider space especially in Obi LGA.

This was inferred from the results which showed that the secondary schools were generally not evenly distributed and scattered across the area. The implication is that some parts of the Local Government Areas were more favoured by this pattern of distribution than others. For instance, in Logo Local Government Area, Mbagbev district had 42% of the schools, Mbanyam had 21.1% of the schools, while Mbavuur had 15.8% of the schools found in the area. Alternatively, Nenzev, Turan, Mbadyuu, and Yonov had 0% of the schools each. This means the four districts had no school during the study period. In Gboko Local Government area, 43.4% of the 83 schools were found in the township district. The remaining 56.6% of the schools were shared among 12 districts, while one of the districts had no single school. In Obi Local Government Area, Okpokwu had 22.2% of the 18 schools each, Itogo, Ikwokwu, Obarike and Ogore had 11.1% of the schools each. The rest districts had 5.5% of the schools each except Irabi which had 0% of the schools distributed in the area.

Generally, Gboko Local Government area had 69.2% of the total schools sampled, Logo Local Government Area had 15.8% of the total schools sampled while Obi Local Government Area had 15% of the total schools sampled. This implies tha Gboko Local Government Area was more favoured by this

pattern of distribution than its rural counterparts. Comparatively, Logo and Gboko Local Government Areas have more similarities in terms of the patterns of spatial distribution of secondary schools than Obi Local Government Area. The random distribution pattern which turned towards clustering was significant in two (Logo and Gboko) out of the three local government areas, consequent of the regional differences brought about by political zonation and tribal differences in the state. One (Obi) out of the three Local Government areas had a dispersed pattern of schools distribution. This shows the variation of the school patterns found in the study area. These varied and heterogeneous patterns of school distribution in the area leads to the uneven nature of school distribution across the area. The Findings conform to prior researches that have identified random pattern of distribution of secondary schools in other parts of Nigeria (Olawole *et al,* 2015).

The study further revealed that there was deficiency in the distribution of secondary schools among the districts (Figure 5). Some districts are over serviced; others are under serviced while others are completely neglected. This indicates that the secondary schools are inadequate and unevenly distributed in the districts. Thus, there is no equity and equality in the patterns of school distribution found in the area. This result is in agreement with the findings of Khalid and Hamdy (2013) in Kuwait which found uneven distribution of schools and lack of schools in many districts. The disparity in spatial patterns of secondary schools have both positive and negative effects on residents' accessibility levels. Positive for the residents of the more favoured locations, like Mbagbev and Mbanyam in Logo LGA and Township in Gboko LGA, who obviously have higher accessibility potentials (Figure 4). In these locations, the favourable conditions of access can attract more students to secondary school. Alternatively, the residents of the disadvantaged locations like Nenzev, Yonov,Turan and Mbadyuu in Logo LGA and Irabi and Odiapa in Obi LGA which do not have secondary schools, will have to trek long distances to access secondary education (Figure 5). This can discourage students, leading to truancy and high dropout rates among the youth in the area. The uneducated youths will be left

with little or no option than to indulge in social vices and their attendant consequences on the society as a long term effect of the distribution patterns found in the areas.

This result implies that, any further decision to allocate or create new secondary schools in the study area must first favour Obi and Logo Local Government Areas, since Gboko has the highest number of Secondary Schools. To intensify efforts towards allocation of schools in the Local Government Areas, policies should be made for the government to either create more schools in the Local Government Areas or relocate the existing schools from the over serviced districts to the disadvantaged areas. This is to ensure that there is equity and equality in the distribution of secondary schools across the districts in the Local Government areas.
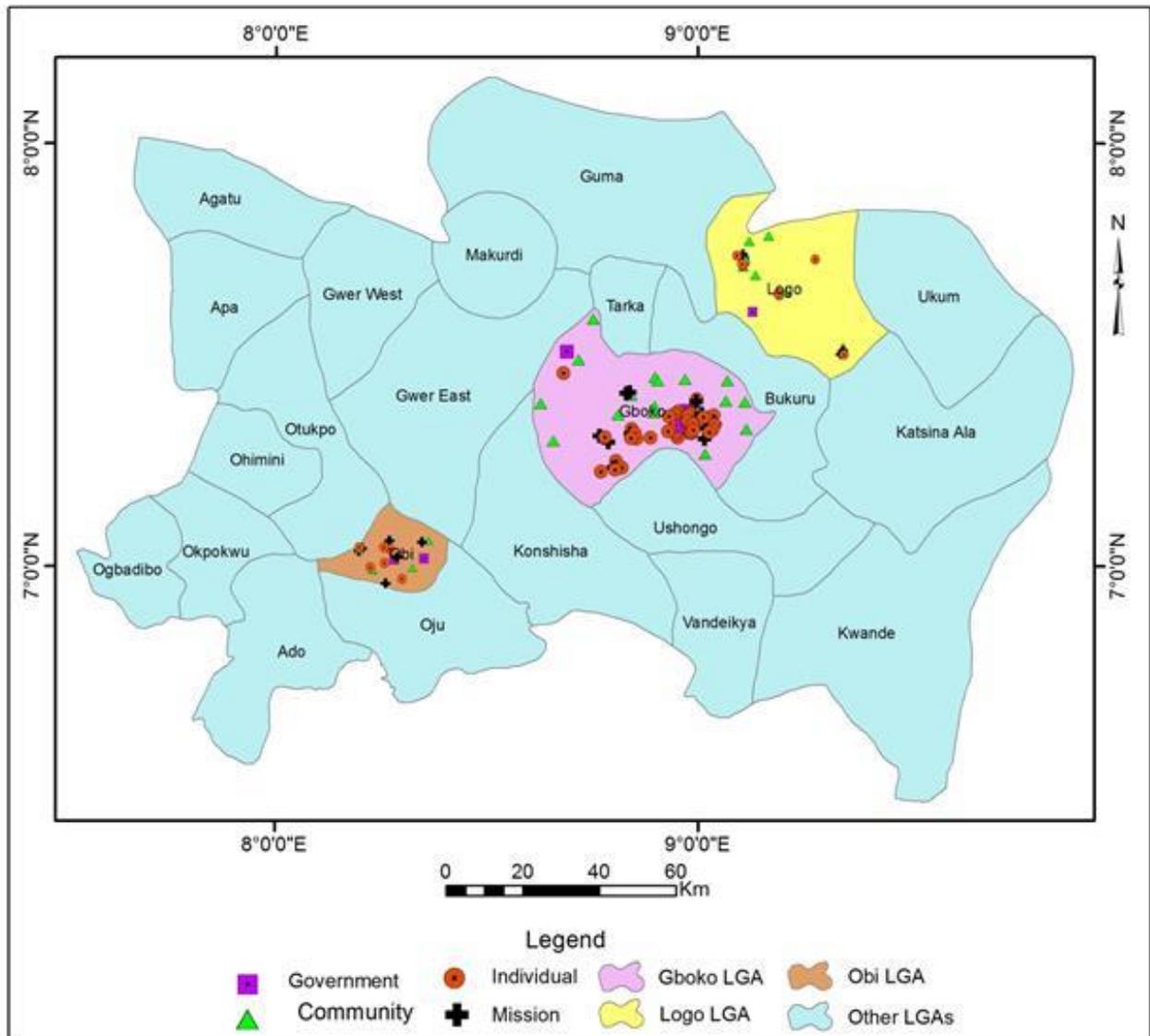

Figure 3 Spatial Patterns of Secondary Schools in Logo, Gboko and Obi LGAs, Benue State
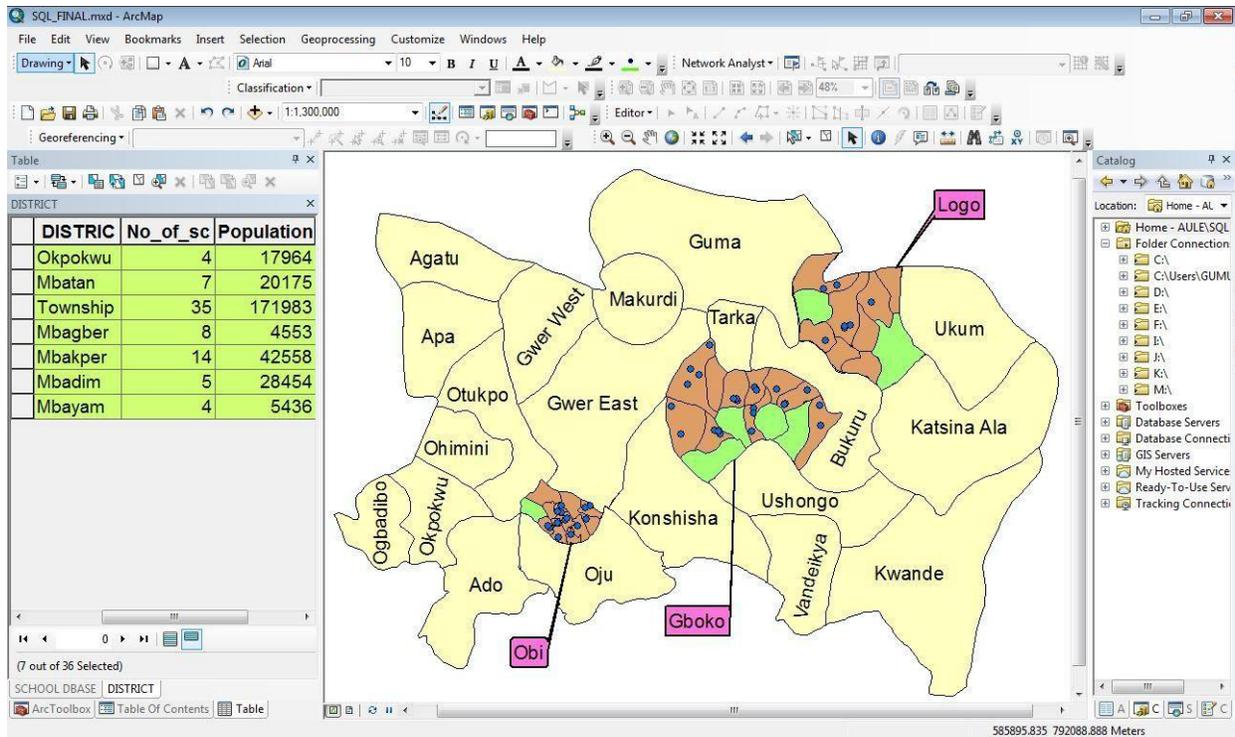
Figure 4 Spatial Query showing all the Districts with more than 3 Secondary Schools
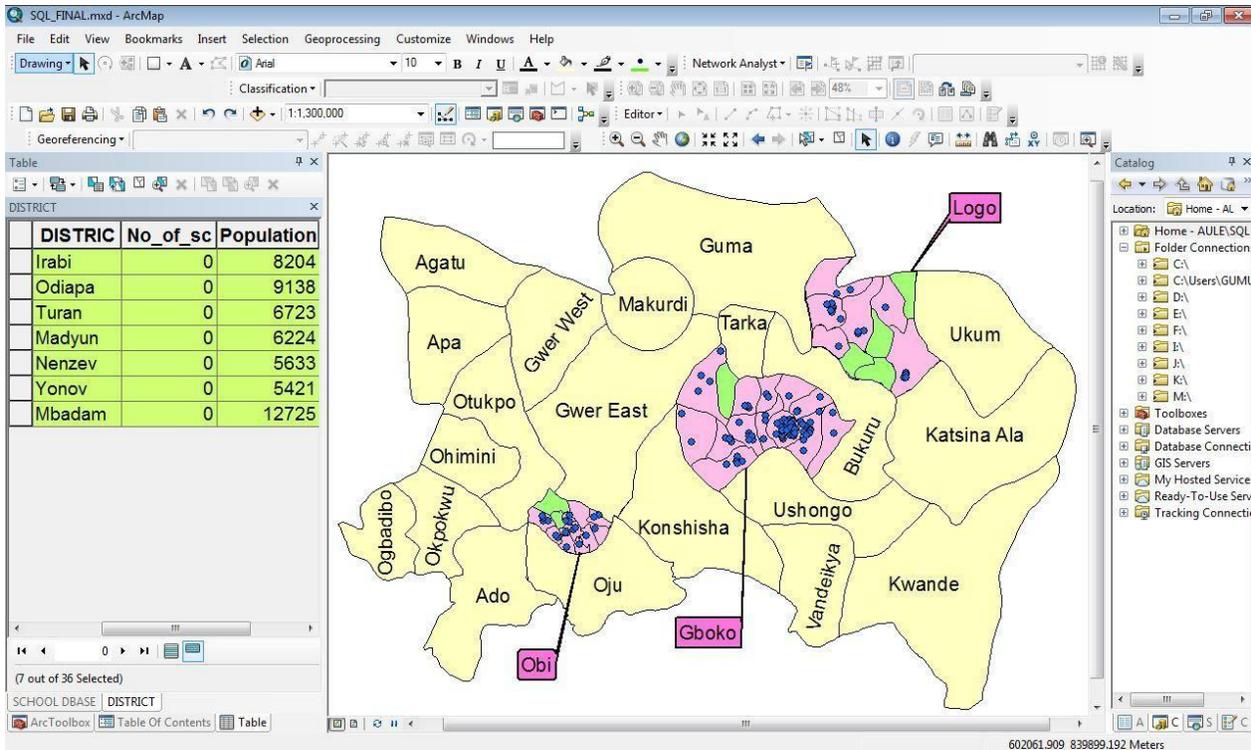

Figure 5 Spatial Query showing all the Districts without Secondary Schools

CONCLUSION

This research has been able to demonstrate the dynamic capabilities of Geographic Information System (GIS) applications and Global Positioning System (GPS) in carrying out spatial analysis. The study has shown how GIS approaches can be used to provide a descriptive analysis of spatial locations and spatial distribution patterns.

The study revealed that the secondary schools in the Selected Local Government Areas of Benue State were unevenly distributed. This implies that most students would find it stressful travelling through long distances to school. This may result to inconsistent school attendance and poor performances. Some students may end up as dropouts, others as perpetual late comers.

Since these patterns have been influenced by: the major stakeholders to secondary school; the interest of the residents in education and development; the settlement patterns obtained in the Local Government Areas; it is recommended that further research be conducted to create anupdateble map and database of the schools in the study area, .

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