Analysis of School Population Growth and Educational Infrastructures/Facilities in Makurdi Town, Benue State

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Abstract: The study examined the growth in school population and educational infrastructures/facilities in Makurdi Local Government Area of Benue State. The specific objectives of the study were to identify the educational institutions and facilities in Makurdi town and to examine the growth in school population and its pressure on educational infrastructures/facilities in Makurdi Town. The study population include secondary schools and its facilities, teachers and students. The research studied 5 Secondary Schools selected via simple random sampling technique. The research data were collected through inventory/measurement of school infrastructures/facilities. Data were analysed and presented via frequency, percentage, ratios and tables. The result shows that most of the schools did not experienced increased in school population growth between the year 2009 and 2019. Most of the schools did not exceed the UBEC, 2010 recommended standard (1440) pupils per school in an urban area. No school exceeded the standard limit of student/teacher ratio (35-40) pupils set by NPE (2004) and UBEC (2010). Majority of the schools met the standard requirement of 40 pupils per class. Only few schools failed to meet the standard classroom size requirement (56.0M²) recommended by UBEC, 2010. The schools also meet the individual students/space requirement (1.4M²) set by UBEC, 2010 and NPE, 2004. Only three schools meet the standard library requirement $(120.0M^2)$ for 40 pupils. The schools did not meet the standard requirement for computer laboratory (140M²) set by UBEC, 2010. Most of the schools did not meet the standard space requirement (3.5M²) for each pupil set by UBEC, 2010. None of the schools meet the physics, chemistry and biology laboratory standard requirement $(140.0M^2)$ and individual space requirement $(3.5M^2)$ set by UBEC, 2010. All the schools have various sport facilities. The schools have access water but did not meet the UBEC (2010) requirement for urban schools while toilet facilities were grossly inadequate. Although some of the schools did not meet all the UBEC (2010) and NPE (2004) standard requirement for schools in urban areas but the current population in all the schools have no serious implication on the facilities for now. The study recommend that all school owners in Makurdi town should adhere strictly to the NPE (2004) and UBEC (2010) requirement for standard secondary school in urban areas.

Keywords: Pupils, Pressure, Education, Infrastructures, Makurdi Town.

I. INTRODUCTION

The world is getting populated despite various regulations put in place by organizations and nations. According to Wood (2011) the earth population would grow so great to overcome the earth ability to provide enough food and other infrastructures necessary for human survival. Abdulrahaman (2013) opined that the fear of world population is on the ration of global population to food and other amenities as postulated by Reverend R.T Malthus.

The current estimate of the world population is 7.9 billion people (Worldometers, 2021). In Nigeria, government documents and researches have shown that there has been a phenomenal rise in population in the last few decades with high growth rate between 2.8% to 3.2%. The population of Nigeria is high, young and is growing rapidly. In the year 1931, the population of Nigeria was 20.06 million, in 1953 the population of Nigeria was estimated at 30.4 million and in 1963, it increased to 55.7 million (Ekanem, 1972). In 1991, the population increased further to 88.5 million and 140 million persons in 2006 (NPC, 2009:1998). The trend is still moving upwards; in 2015, the population of Nigeria stood at 181.6 million putting Nigeria among the league of fast growing population in the world (Population Reference BUREAU (PRB), 2015).

Similarly, Benue States population grew from 2,753,077 million people in 1991 to a population of 4,253,641 million people in 2006 while Makurdi Local Government Area (L.G.A) grew from a population of 239,889 people in 1991 to 300,377 people in 2006 (National population commission, 2009). Whereas, Makurdi town has a population of 151,515 people in 1991 and a projected population of 367,767 in 2021 at an annual growth rate of 3.0% (NPC, 2009 and Tser, 2013). This growth may have implication on basic

infrastructural facilities like housing, water, health, road, power supply and education among others in Makurdi town and beyond.

In the same vain, schools in Benue State have experience growth in population over the years. The pattern of

growth were either increased or decreased as indicated on the table 1. The growth in school population may have implication on educational administration, teachers, students, educational infrastructures/facilities and development in Benue State particularly Makurdi the state capital.

Schools/ Years	2012	2013	2014	2015	2016	2018
Primary School	832924	906352	704175	1008405	537543	743,273
Junior Secondary School	133698	132586	681595	417896	155266	203,686
Senior Secondary School	127141	127141	344,124	434,221	98209	94,569
Total	1,093,763	1,166,079	1,729,894	1,860,522	791,018	1,041,528

Table 1: Summary of Education Admission Statistics in Benue State

Source: Adapted from the Federal Ministry of Education (2016) and (2019)

Previous studies emphasized the importance of the availability of physical facilities in educational institutions. According to Hallack (1990), school facilities form one of the potent factors that contribute to academic achievement in the school system. They include the school buildings, classrooms, accommodation, libraries, laboratories, furniture, recreational equipment, apparatus and other instructional materials; their availability, relevance and adequacy contribute to academic achievement. More so, Owoeye and Yara (2011) state that school facilities are determinant of academic achievement; facilities in terms of personnel, laboratory, library, school building, chairs/tables, administrative blocks, chalk-board, school maps and the likes are very crucial to high academic attainment. They concluded that unattractive school buildings and overcrowded classrooms among others contribute to poor academic achievement in the school system

In addition, Chandan (1999) claimed that for effective teaching to take place in any educational setting; there must be provision of adequate and quality physical facilities. The conditions of the facilities are of utmost importance too. This is why Adedeji (1998) noted that facilities have to be adequate and should be in good condition for schools to function properly. More so, Shah and Inamullah (2012) in a study on the impact of overcrowded classrooms on the academic performance of the students at secondary level, reveals that overcrowding can have direct impact on students' learning and put stress on the teacher.

The review has shown that school infrastructures and facilities are vital for effective teaching and learning in all society. Therefore, the availability of school infrastructures and facilities in the context of this study refers to the administrative blocks, classrooms, library, laboratory, sport/games and instructional materials available for the school programme while adequacy of school infrastructures and facilities refers to the extent to which the available buildings, instructional spaces and materials meet the quantitative and qualitative requirement of the educational programme in the education institutions.

In this regard, for best result in utilizing educational infrastructures and facilities in secondary schools in urban areas in Nigeria, the schools are expected to have a population of not more than 1440 pupils each with a standard student/teacher ratio of 35-40 pupils per teacher per class. While a standard classroom size is $56.0M^2$ with a student/classroom space ratio of 1.4M² per student. Whereas a standard laboratory is measured $140M^2$ with a student/laboratory space ratio of $3.5M^2$ per individual student. In addition, a library is supposed to be $120M^2$ to accommodate a complete class of 40 students at a seating. The schools are supposed to have one (1) pipe born water unit for every 50 pupils and one (1) urinal to every 40 pupils (NPE, 2004 and UBEC, 2010). This study therefore, examine the growth in school population and its pressure on education infrastructures/facilities in Makurdi town, Benue State

II. THE STUDY AREA

Makurdi town doubles as the capital of Makurdi L.G.A and headquarters of Benue State. It is located between Latitude 07^0 30° N to 08^0 00° N of the Equator and Longitude 08^0 00° E to 09^0 00° E of the Greenwich Meridian (Benue State Ministry of Lands and Survey, 2019). Though, the Tiv ethnic group dominates the area, several other ethnic groups like the Idoma, Igede, Igbo, Hausa, Yoruba among others inhabit the town. Makurdi town has a population of 151515 people in 1991 and a projected population of 367,767 in 2021. The dominant occupation in the town is civil/public service apart from commercial centres/activities like trade, banks, breweries, plastic/leather Company, food processing companies, educational and health institutions (Lyam,2005).



Figure 1: Makurdi Town Showing the Selected Schools Benue State Ministry of Lands and Survey, 20193.

III. MATERIALS AND METHODS

The study population comprises secondary schools, students, teachers and educational infrastructures/facilities located within Makurdi town in the year 2009 compared to 2019. The schools include both private, government and missionary schools, gender based and mixed schools as well as boarding and day schools (See Figure 1 and table 2). The study used only 9% (5 secondary schools) of the entire secondary schools (62 secondary schools) in Makurdi town. The study used simple random sampling technique in selecting the 5 schools via a table of random numbers. The selected schools include Tilley Gyaado College, Mount St Gabriel College, ECWA Secondary Schools, Government Model College and Government Day College Makurdi.

The research data includes the names/location of the secondary schools, number of students, number of teachers, school buildings and facilities in Makurdi town. This was sourced from the ministry of education and the secondary schools through inventory and measurements of school infrastructures/facilities. Data on the number of facilities, student teacher ratio, student classroom ratio, student classroom, library, and laboratory ratio and space capacity were determined by the study through direct measurement and inventory of the school buildings and facilities in real time. Map of the study area was obtained from the ministry of lands and survey Makurdi, Benue State. The research data was tabulated and analysed using frequencies and ratios.

IV. RESULTS AND DISCUSSION

4.1 School Ownership, Location, Student Population and Pressure on Teachers

The research studied five (5) secondary schools in Makurdi town on the basis of types of ownership (private, mission and government). Tilley Gyado College (TGC) is a private school; Mount St Gabriel (MSG) and ECWA Secondary Schools (ESS) are missionary schools while Government Model (GM) and Government Day College (GD) are government owned schools. Among these schools, Mount St Gabriel and Government College are gender base school involving only male students while the rest are mixed school involving both male and female students. Also, Mount St Gabriel is a burden Schools while Tilley Gyado has both day and burden students (See Figure 1 and table 2).

In addition, the result presented on table 2 also indicates that Government Model is the most populated Secondary school among the sampled schools. It has a student population of 2000 in 2009 and 1700 pupils in 2019 followed by Mount St Gabriel with a population of 1141 in 2009 and 973 students in 2019. The least populated school is Government College; it has 400 students in 2009 and 600 in 2019. Although, it is only Government College that has experienced an increased in school population growth between the two academic sessions under review, the other schools experienced decreased in school population in 2019 compared to 2009.

In line with the universal basic education commission standard, Government Model is over populated in the year 2009 and 2019 respectively because its population is above the mandatory standard secondary school population limit of 1440 pupils for schools in urban environment (UBEC, 2010). The school with the highest student teacher ratio (24 student per teacher) in 2009 is ECWA Secondary School and Government College (22 students per teacher) in 2019 while the school with the least student teacher ratio is Government College (4 students per teacher) in 2009 and 6 students per teacher in 2019. In line with best practices in Nigeria as stipulated by the UBEC (2010) and National Policy on Education (2004), none of the selected schools has high student teacher ratio beyond the policy standard or recommended level of 40 students per teacher in the secondary schools. Conclusively, majority of the schools are under populated and has little or no student pressure on teachers. Therefore, the schools met the minimum standard population and student teacher ratio set by UBEC, 2010

Schools Location			Gender		2009		2019		
	Location	Ownership		Students	Teachers	Student Teacher/ Ratio	Student	Teachers	Student/ Teacher Ratio
TGC	North Bank	Private	Mixed	720	44	16:1	559	43	13:1
MSG	High-level	Mission	Male	1141	86	13:1	973	107	9:1
ESS	North Bank	Mission	Mixed	664	28	24:1	509	36	14:1
GM	Low-level	Government	Mixed	2000	115	17:1	1700	78	22:1
GD	High-level	Government	Male	400	105	4:1	600	95	6:1

Table 2: School Ownership, Population and Student/Teacher Ratio

Source: Fieldwork, 2019

4.2 School Population and Pressure on School Infrastructures/Facilities

Table 3 indicates that the average number of pupil per classroom seems relatively okay in the schools in 2009 and 2019 except in Government Model Colleges which has 56 pupils per class in 2009 and 47 pupils in 2019 which is above the maximum standard requirement (40 pupils per class). Generally, the schools met the stipulated maximum standard requirement of 40 pupils per class by UBEC (2010) and NPE (2004). Apart from Government Model which has high classroom pressure due to large students, the remaining schools have low population pressure. Hence the classes are very adequate for teaching and learning. Furthermore, the study shows that only two schools (Tilley Gyado and Government Model College) which has a classroom size of $51.46M^2$ and $51.04M^2$ respectively in 2009 and 2019 did not meet the standard classroom size requirement of $56.0M^2$ recommended by UBEC (2010). Mount St Gabriel has the best spacious classroom size ($80M^2$) which is far above the UBEC (2010) standard or recommended size. In addition, the schools met the individual student space requirement of $1.4M^2$ except in Government Model College where the individual student space requirement of their population. Generally, the students were adequately space for teaching and learning in the schools in Makurdi town as recommended by UBEC (2010) and NPE (2004).

Table 3: School Population and Students/Classroom Ratio

		2009)		2019					
Schools	No. of Student	No. of Class room	Student/ Class room Ratio	Classroom Space (Area in M ²)	Ratio of Space per Student (M ²)	No. of Student	No. of Class room	Student/ Class room Ratio	Classroom Space (Area in M ²)	Ratio of Space per Student (M ²)
TGC	720	24	30:1	51.46	1.7	559	24	23:1	51.46	2.2
MSG	1141	36	32:1	80.36	2.5	937	36	26:1	80.36	3.1
ESS	664	18	37:1	57.27	1.5	509	18	28:1	57.27	2.0
GM	2000	36	56:1	51.04	0.9	1700	36	47:1	51.04	1.1
GD	400	23	17:1	56.16	3.3	600	23	26:1	56.16	2.2

Source: Fieldwork, 2019

4.3 School Population and Pressure on School Library, Computer, Physics, Chemistry and Biology Laboratory

A standard library for a secondary school should be $120.0M^2$ in size to accommodate 40 students or a complete class at a seating (UBEC, 2010). Table 4 indicate that only three schools (Mount St Gabriel, Government Model and Government College) met the standard library size requirement. More so, Government Model College has the largest Library (147.74 M² capacity) whereas, Tilley Gyado College and ECWA Secondary School failed short of the standard library requirement. Similarly, the standard library space ratio per individual student is $3.0M^2$ according to UBEC (2010). However, two schools; Tilley Gyado College library (2.7M²) and ECWA Secondary School library (2.1M²)

individual space ratio failed short of the standard library individual space ratio requirement per pupils. The size of the library needs to be upgraded in these two schools otherwise it will impede learning.

Furthermore, standard laboratory (Lab) by UBEC (2010) should be $140M^2$. In this case, none of the computer laboratory in the selected secondary schools meets this requirement. In terms of individual space requirement, it is only Government College Computer Lab ($3.7M^2$ individual space area) that meets the laboratory standard requirement of $3.5M^2$ space area per individual student in the computer Lab. Hence, the remaining 4 schools fall short of the standard and may have negative effect on the teaching and learning of computer science because of inadequate space and facilities.

Similarly, the physics, chemistry and biology laboratories in all the schools failed short of the minimum standard requirement of $140M^2$ size and $3.5M^2$ individual space requirement. These laboratories may likely be unable to serve

the future needs of the schools if school population growth is positive considering the current high youth population and the demand for education in Benue and Nigeria at large.

Schools	Library (Lib) Area (M ²)			Computer Laboratory (Lab) Area (M ²)		Physics/Chemistry and Biology Laboratory (Lab) Area (M ²)		
TGC			63.07	61.	.88	66.43		
MSG			134.52	68	.16	60.7	72	
ESS			59.63	61.74		67.32		
GM		147.74		46.08		58.08		
GD		127		97.02		65.65		
	Student/Lib Sp Ratio (M ²) in V 2009	oace Year	Student/Lib Space Ratio (M ²) in Year 2019	Student/ Computer Lab Space Ratio(M ²) in Year 2009	Student/ Computer Lab Space Ratio (M ²) in Year 2019	Student/Physics/ Chemistry/Biology Lab Space Ratio (M ²) in Year 2009	Student/Physics/ Chemistry/ Biology Lab Space Ratio (M ²) in Year 2019	
TGC	2.1		2.7	2.1	2.6	2.2	2.8	
MSG	4.2		5.1	2.1	2.6	1.9	2.3	
ESS	1.6		2.1	1.7	2.2	1.8	2.4	
GM	2.6		3.1	0.8	0.9	1.0	1.2	
GD	7.5		4.8	5.7	3.7	3.9	2.5	

Table: 4 Students/Librar	v/Computer/	Physics/Chemistr	v/Laborator	v Individual Si	pace Capacit	v Ratios
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Source: Fieldwork, 2019

4.4 Population Pressure on Library, Computer, Physics, Chemistry and Biology Laboratory Facilities

Assuming a complete class of 40 students were to go into the Library at the same time in each of the schools, table 5 indicate that there will be no pressure on facilities in the library in most of the schools because there are enough seats in the library to accommodate the 40 students' bench mark at once except in ECWA secondary school where there are 36 seats in the library. All the schools currently have more seats compared to the number of students in each class. Alternatively if the same class of 40 or the current class population of students were to go for computer practical, there will be inadequate computers to students in most of the schools (Tilley Gyado, ECWA and Government Model College which has less than 40 computers in their Labs) except in Mount St Gabriel and Government College which has 84 and 60 computers respectively which is above the Lab population threshold of 40 students. Inadequate computers may have effect on teaching and learning. Also, most of the laboratories have adequate seat for lesson and practical. However, the seats will be more inadequate if a class of 40 science students is assumed to go in for a practical lesson in laboratory except in Mount St Gabriel and ECWA secondary school which has 30 and 36 seats against student class population of 26 and 28 respectively. The ratio of students to seat seems poor in Tilley Gyado, Government Model and Government College. More seats needs to be provided in these schools.

Table 5: Population, Library, Computer, Physics, Chemistry, Biology Laboratory Facilities and Ratio

	Year 2019								
Schools	Number of Students	Number of Seat in Library	Student/Library Seat Ratio	Number of Computers in Lab	Student/ Computer Ratio	Seats in Biology Lab	Student/Biology Lab Seats Ratio		
TGC	23	40	1:1.7	13	1:0.5	10	1:0.4		
MSG	26	128	1: 4.9	84	1: 3.2	30	1: 1.1		
ESS	28	36	1:2.8	9	1:0.3	36	1:1.2		
GM	47	50	1:1.1	36	1:0.7	14	1:0.3		
GD	26	120	1:4.6	60	1:2.3	24	1:0.9		

	Number of Students	Seats in Physics Lab	Student/Physics Lab Seats Ratio	Seats in Chemistry Lab	Student/ Chemistry Lab Seats Ratio	
TGC	23	10	1: 0.4	10	1: 0.4	
MSG	26	30	1: 1.1	30	1:1.1	
ESS	28	36	1: 1.2	36	1:1.2	
GM	47	14	1: 0.3	14	1: 0.3	
GD	26	24	1: 0.9	24	1: 0.9	

Source: Fieldwork, 2019

4.5 School Population and Pressure on Sports, Water and Toilet Facilities

Table 6 indicate that all the schools are actively engage in sporting activities as indicated by the presence of functional sport facilities in their sport arena. The most common types of sport among the schools include football, handball and volleyball. Other sports are basketball, tennis, javelin and relay. The schools have common source of water (well and borehole) accessible to both staffs and students. None of the schools meet the UBEC (2010) standard water requirement of 1 pipe born water unit to every 50 pupils specifically for schools in urban areas. Similarly, none of the schools met the 6 toilet requirement per class level or 36 toilets per urban school nor the ratio of 1 urinal to 40 students stipulated by UBEC (2010). The human waste collection/deposition systems are inadequate and poor except in Government College where the ratio is 1:30. Government College has the highest number of toilets. The human waste management system is worst at Government Model where the ratio is 425 students to one toilet. More toilets are needed in all the schools because of high student population pressure on the few available toilet facilities. The study indicated that Government Day College has 20 toilet facilities while ECWA Secondary School has 12 toilets whereas Tilley Gyado and Mount St Gabriel have 10 toilet facilities each. Government Model College have only 4 toilets which by all standards is grossly inadequate. It is only Government Day College that has relatively fair number of toilet facilities.

Table 6: Available Games, Water and Toilet Facilities in the Selected Schools in the Year 2019

Schools	Available Game facilities	Water Facilities	No. of Toilet	Student/Toilet Ratio
TGC	football, handball, volleyball and table tennis	Nil	10	55.9: 1
MSG	football, handball and volleyball	4 well and 4 boreholes	10	97.3:1
ESS	football, volleyball and table tennis	1 Well and 1 borehole	12	42.4: 1
GM	Football, handball, volleyball, basketball and javelin	Pipe Born water, 1 Borehole and 1 Well	4	425: 1
GD	football, basketball and handball	4 Well and 4 Borehole	20	30: 1

Source: Fieldwork, 2019

4.6 Conclusion and Recommendation

The study concluded that there is change in school population growth in Makurdi town between the year 2009 and 2019. Apart from Government Model College which experienced high increased in school population growth in 2019, the remaining schools rather experienced decreased in school population in the year 2019 compared to 2009. The government owned schools has more teachers than the private and missionary owned schools. The schools have low student/teacher/classroom ratio which is appropriate for learning. Although some of the schools did not meet all the UBEC (2010) and NPE (2004) standard requirement for schools in urban areas but the current population in all the schools has no serious implication on the educational infrastructures/facilities for now except if there is increased in school population in the future where a class of 40 student is expected to sit at a time. Currently, the schools are relatively okay for learning.

The study recommends that all school owners in Makurdi town should adhere strictly to the NPE (2004) and UBEC (2010) requirement for standard secondary school in urban areas in Nigeria. Government through its ministry, agencies, departments and non-governmental organisation should monitor educational institution closely to ensure that schools are built according to required specification as enshrined in the education policy and according to global best practices. All schools should emphasised quality of students rather than quantity in the business of delivering education to the masses in both rural and urban areas in line with the NPE (2004) and UBEC (2010) standard requirement. Government should consider the plight of educational institution and the Nigerian students in the quest for standard education and grant all schools free access to water supply to enhance quality service delivery in all the schools in both rural and urban areas in Benue State and beyond.

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