SPATIAL DISTRIBUTION OF GOVERNMENT PRIMARY AND SECONDARY SCHOOLS AND THE FREE AND COMPULSORY EDUCATION POLICY IN AKWA IBOM STATE, NIGERIA

By

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ABSTRACT

This study attempts to answer the questions on whether the number and spatial distribution of available state owned primary and secondary schools in Akwa Ibom state, Nigeria can actually support the government policy of free and compulsory education in the state. The study examined the relationship between the available public schools and population as well as land area. The causality of the establishment and distribution of public primary and secondary schools were equally investigated. The result of this investigation reveals that though there is linear correlation between land area and number of public schools, and between population and number of public schools, yet neither land area nor population is the cause of establishing public schools in the state. Statistics reveal that the number of available public schools cannot make the free and compulsory education policy attainable, since private schools outnumber public schools. More public schools, which should be evenly distributed based on land area and population are needed for the policy to succeed. This is very necessary, since there is no better investment for any society than training the children and the youth.

Keywords: Akwa Ibom State, Free and Compulsory Education Policy, Land Area, Population, Primary Schools, Public Schools, Secondary Schools, Spatial Distribution.

INTRODUCTION

Affording the means of acquisition of knowledge, has been acknowledged as the greatest benefits that can accrue to mankind. It has been known to prolong life and extend the sphere of human existence. This means of acquiring knowledge, known as education, is a partner which cannot be depressed by misfortune, destroyed by criminality, alienated by enemy, or enslaved by despotism. Education is a friend at home, a guide abroad, a comfort in a time of distress, and a light to a society. It leads to the discovery of genius, prepares our children and youths for leadership, restrains bad habits, and points to decency, integrity, and justice. Without education, man would be a handsome slave of nature and a primitive being. Perhaps, it is based on the above that James Abraham Gradfield, the 20th President of the United States of America said that "Next in importance to freedom and justice is popular education, without which neither freedom nor justice can be permanently maintained. Above all, the formation of character is the subject to education". Education, therefore is an instrument for development and social change, capable of promoting a progressive, peaceful, and united nation (Okon and Israel, 2016).

It is, however, based on the above, coupled with the report of the United Nation Special Envoy for Global Education which gives 61 million children as the figure that do not go to school and 250 million as the figure for those who cannot read, that the United Nation has placed less focus on global education, making a commitment through the Millennium Development Goals and Education for all to

achieve universal education (UN Gobal Initiative, 2015).

This education imbroglio as indicated in the United Nation report, despite the fact that government of some countries, regions, and states have proclaimed free and compulsory education policy for children and people within school age in their respective territories (Dike, 2000) is very worrisome, suggesting that such proclamations are either mere political talks or are poorly implemented without good foundation. The case for this research is to study the spatial distribution of available government owned primary and secondary schools in Akwa Ibom state, Nigeria in relation to population as well as Land area with the aim of establishment, the cause of establishing, and distribution of public schools in the state.

Educational Indices

Researchers have severally reported on some indicators. They include conducive physical environment, class size/population, teacher-student ratio, availability of well trained teachers, teaching methods, teaching aids, well-equipped library, proper and functional school management and administration, proper supervision and monitoring, welfare and salaries for teachers and other staff, proper budgeting and adequate funding among others (Zeelen, 2012; Oleforo and Anugwu, 2014; Oleforo, 2014; Etuk, 2006; Ibia, 2006; Labo-Popoola et al., 2009; Leskes and Wright, 2005; Oluremi and Oyewole, 2013; Prezyna et al., 2017).

This research is predicated on consideration of the listed indicators which provokes the question whether the number of available state government owned primary and secondary schools in Akwa Ibom State, Nigeria, can actually make the State Government policy of free and compulsory education a reality, or is it a mere political utopia? Can the available number of government schools provide the policy with a leg to stand on? This question becomes necessary since other indicators cannot be functional without existence of schools. It is a known fact that teachers are found in schools, students are found in schools, school management, administration, budget and monitoring take place in schools, teaching aids, and application of teaching methods require school environment to thrive.

This research is therefore designed to asses, troubleshoot, and diagnose the fundamental and potential problem capable of hindering the successful implementation of the state free and compulsory education in Akwa Ibom State, Nigeria, which is spatial distribution of government owned primary and secondary schools in the state.

1. Study Location

The study was carried out in Akwa Ibom State in Nigeria. The state lies between Latitude $4^{\circ}30^{1}$ and $5^{\circ}30^{1}$N and Longitude $7^{\circ}50^{1}$ and $8^{\circ}20^{1}$E, having a land area of 7249 km^2 and a population of 5,272,029 people. It is bounded on the East by Cross River State, on the West by Rivers state, on the North by Abia state, and on the South by the Atlantic Ocean. It has a shoreline of 129 km and encompasses the Qua Iboe River Basin and the Eastern half of the Imo River Estuary (Government of Akwa Ibom State of Nigeria, 2014). The state is one of the richest petroleum oil states in the Niger Delta region of Nigeria. It was created on September 23, 1987. The state comprises thirty one local government areas. Figure 1 shows the map of the study area.

2. Statement of the Problem

The free and compulsory primary and secondary schools education policy by the Akwa Ibom state government demands among other things, provision of enough public primary and secondary schools that are evenly and adequately well distributed to cater for the number of pupils and students within the primary and secondary schools age, respectively. Observably, there appears to be less number of public primary and secondary schools, leading to overpopulation of pupils and students in public schools, hence resulting in classes being overcrowded. Moreover, the available public primary and secondary schools in the state seem not to be evenly distributed spatially. The situation has brought about difficulties in many within the primary and secondary schools age brackets being able to secure admission in public schools.

Considering the above problems, there is need to assess the relationship between the population and the spatial distribution of public primary schools as well as secondary schools in the state imperially. Equally to be assessed, is the relationship between land area and the spatial distribution of public primary as well as secondary schools in the state.

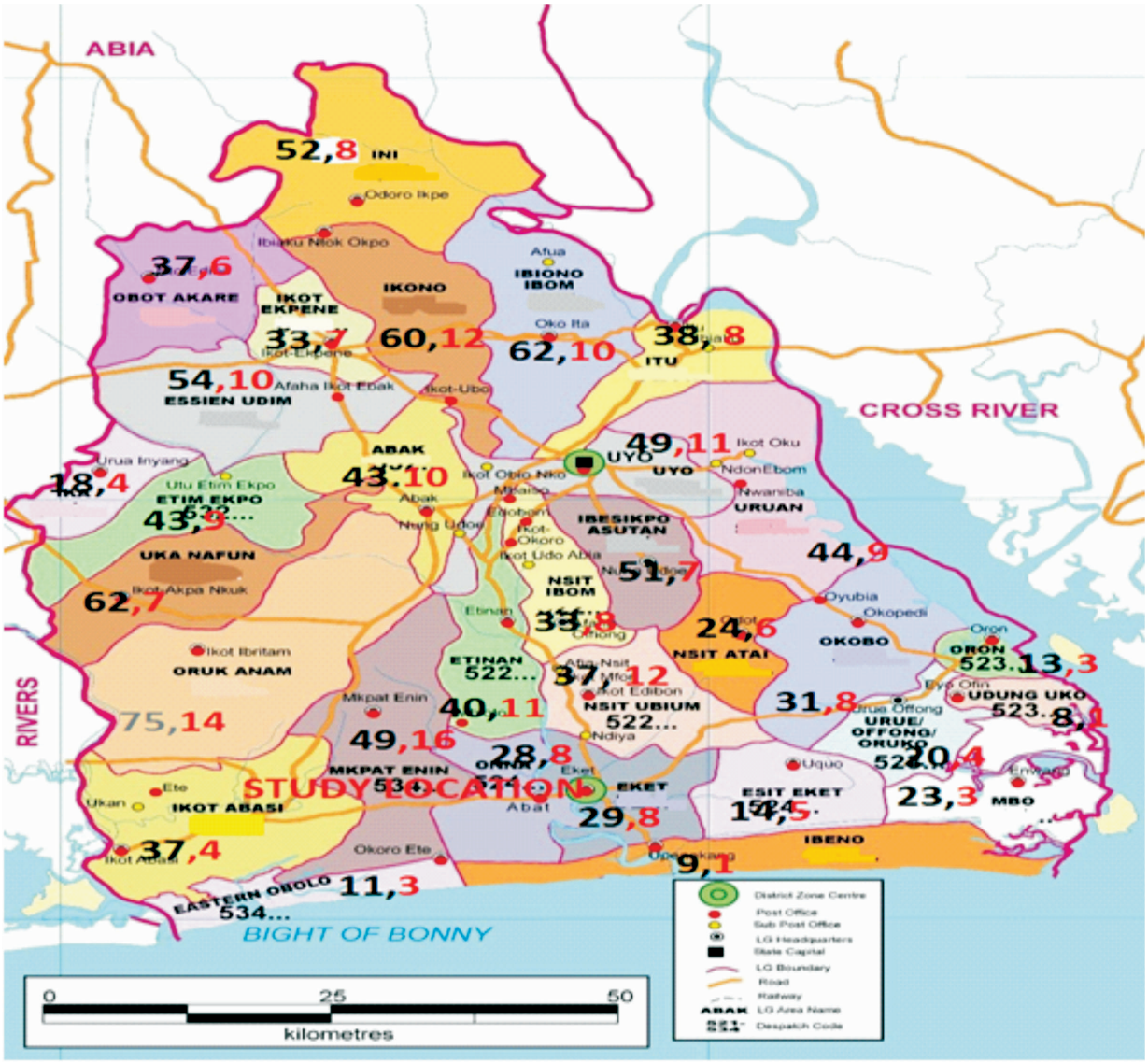

Figure 1. Map of Akwa Ibom State showing the Number of Government Owned Primary Schools Indicated in Black and Number of Government Owned Secondary Schools Indicated in Red

It is also expedient to investigate whether land area or population is a causal variable for distribution of public primary and secondary schools in the state.

Government policy of free and compulsory education require fundamental, adequate, and properly distributed government established or owned primary and secondary schools within the territory covered by the policy for the successful implementation of the policy.

2.1 International Convention and State/Legislative Enactment on Free and Compulsory Education

The United Nation Universal declaration of Human Right in its Article 26 provides for free and compulsory education thus:

> *Everyone has the right to education. Education shall be free, at least in the Elementary and Fundamental stages. Elementary education shall be compulsory…*

The above international protocol is domesticated in Nigeria. In Nigeria, free, compulsory, and universal primary education as well as free secondary, university education, and free adult literacy program are provided for in Sections 18(3) (a-d) under education objectives and directive principle of state policy in the constitution of the Federal Republic of Nigeria (1999). This, though a constitutional

provision at the state or municipal level, which emanates from the international protocol, as the one earlier cited, and despite the use of the word "shall" in the enactment conveying the force of law, yet, it is not enforceable in court, because of the non-justifiability.

Based on the above provisions, Godswill Akpabio (2008) in his address as the Executive Governor of Akwa Ibom State, on the occasion of the International Literacy day celebration echoed that the observance of the annual event for the year came on the heels of the state declaration of a free compulsory and qualitative education for the children from primary to secondary school. There was, however, an observation of disproportionate concentration of literate persons in urban areas as compared to rural residents, by the governor.

3. Research Questions

In designing this work, the following research questions arose:

- Is there any relationship between land area and spatial distribution of public primary schools in Akwa Ibom state, Nigeria?
- Is there any association between land area and the distribution of public secondary schools in Akwa Ibom state, Nigeria?
- Is there any correlation between population and the distribution of public primary schools in Akwa Ibom state, Nigeria?
- Is there any relationship between population and the distribution of public secondary schools in Akwa Ibom state, Nigeria?
- Does land area have any significant influence on the distribution of public primary and secondary schools in Akwa Ibom state, Nigeria?
- Has population any significant influence on the distribution of primary and secondary schools in Akwa Ibom state, Nigeria?

4. Proposed Hypothesis

The following null and alternative hypothesis were proposed to search out answers to the research questions earlier put forward in this work.

4.1 Hypothesis 1

H_0: There is no relationship between land area and the distribution of public primary schools in Akwa Ibom State.

H_1: There exists a relationship between land area and the distribution of public primary schools in Akwa Ibom State.

4.2 Hypothesis 2

H_0: There is no association between land area and the distribution of public secondary schools in Akwa Ibom State.

H_1: There is an association between land area and the distribution of public secondary schools in Akwa Ibom State.

4.3 Hypothesis 3

H_0: There is no correlation between population and the distribution of public primary schools in Akwa Ibom State.

H_1: There is a correlation between population and the distribution of public primary schools in Akwa Ibom State.

4.4 Hypothesis 4

H_0: There is no relationship between population and the distribution of public secondary schools in Akwa Ibom State.

H_1: There is a relationship between population and the distribution of public secondary schools in Akwa Ibom State.

4.5 Hypothesis 5

H_0: There is no significant influence of land area on the distribution of public primary and secondary schools in Akwa Ibom State.

H_1: The distribution of public primary and secondary schools in Akwa Ibom State is significantly influenced by land area.

4.6 Hypothesis 6

H_0: There is no significant influence of population on the distribution of public primary and secondary schools in Akwa Ibom State.

H_1: There is a significant influence of population on how public primary and secondary schools are distributed in Akwa Ibom State.

5. Hypotheses Testing

In this work, hypotheses 1, 2, 3, and 4 were tested using correlation analysis since they do not involve causality or dependency. In order to determine the type and degree of association between the existing variables, two methods were used namely;

- Pearson's coefficient of correlation, r
- Spearman's Rank correlation coefficient, ρ.

Chi-square is the statistical tool used in testing hypotheses 5 and 6 since they involve causality or dependence of one variable on another.

6. Method of Collecting Data

Micro-level secondary data was used for this study. Data on available government established/ owned primary and secondary schools as well as private schools and the number of candidates seeking admission into secondary schools in the state were collected from the state ministry of education. Data on the population of the state, indicating the population and approximated land area of each of the 31 local government areas that make up the state and the total for the state obtained from the state ministry of Economic Development, Uyo, Akwa Ibom state, Nigeria.

7. Data Analysis

The micro-level secondary data obtained was processed and presented as Column Chart under local government area, approximated land area in km^2, population for both sexes, and number of primary schools (Government established and Private) as shown in Figures 2, 3, and 4.

Pearson's coefficient of correlation and Spearman's rank correlation coefficient were employed for data analysis. Tables 1 and 2 are data processed for the analysis.

The values obtained from the analysis are shown in Table 3.

The computed values based on the Chi-square analysis are shown in Table 4.

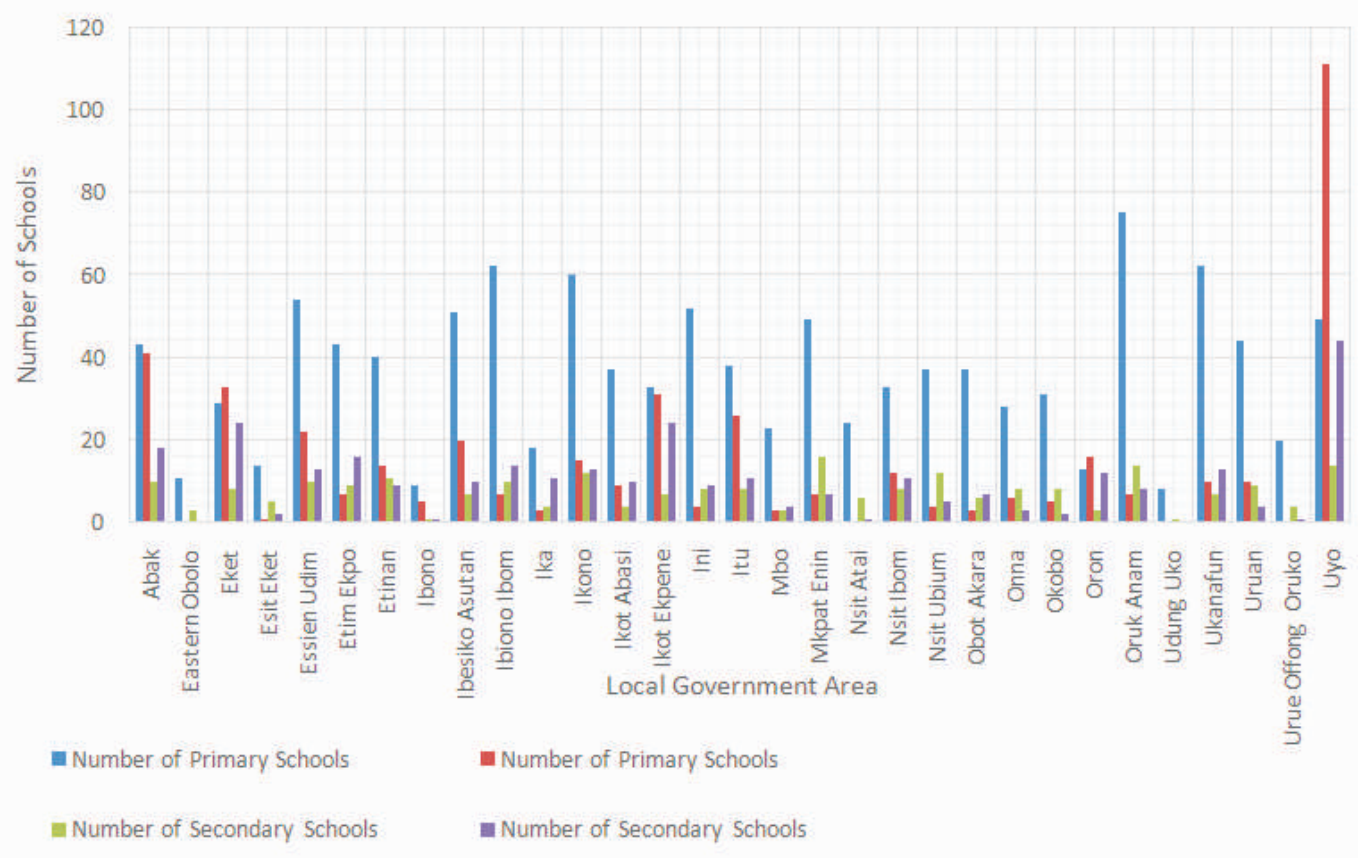

Figure 2. Column Chart showing the Number of Schools for the 31 Local Government Areas

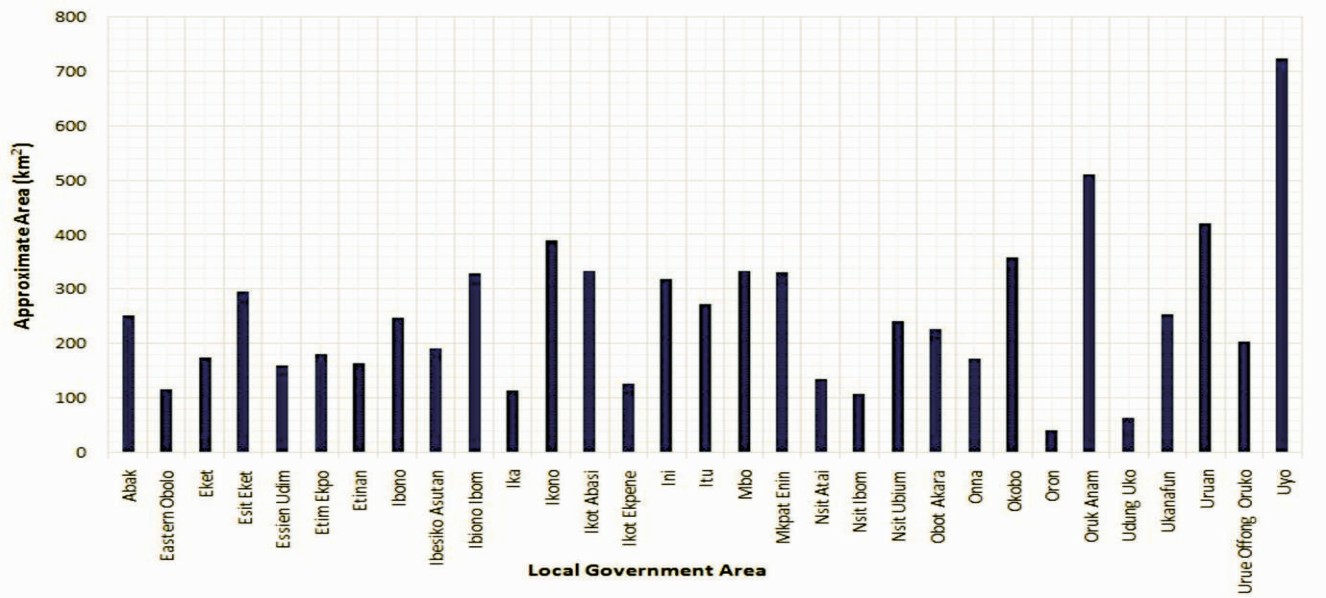

Figure 3. Column Chart showing the Approximate Area of the Study Area

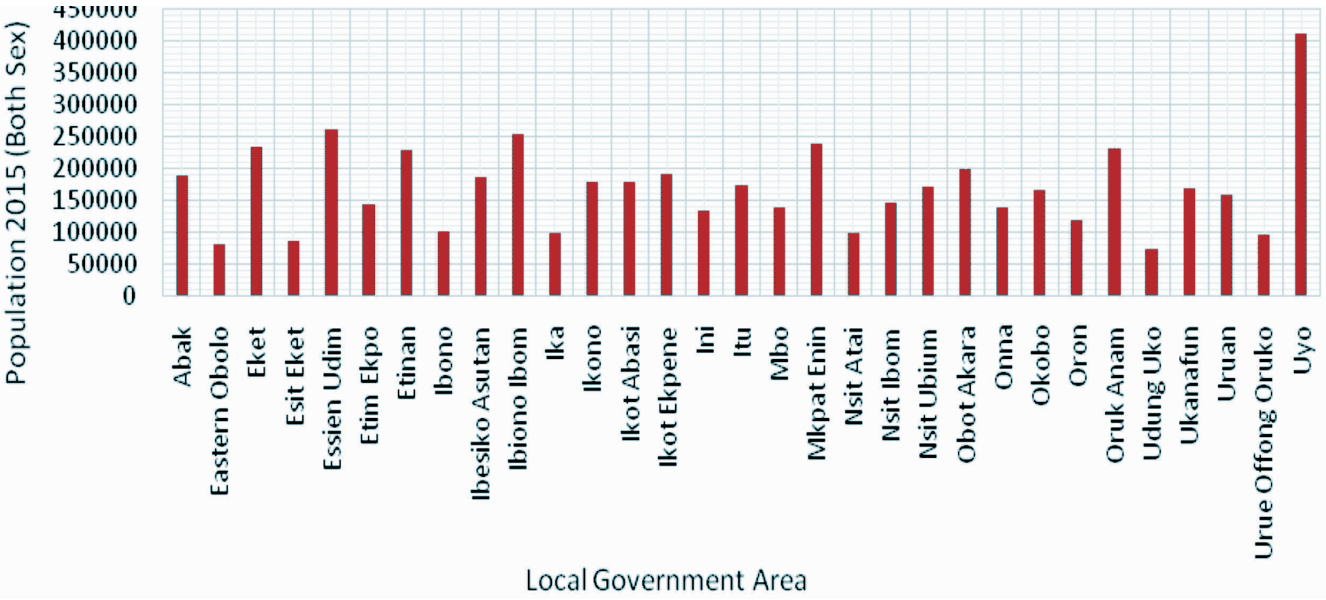

Figure 4. Column Chart showing the Population of the Study Area

8. Result and Discussion

There are a total of one thousand one hundred and twenty seven (1127) public primary schools in Akwa Ibom state (State Government owned) and four hundred and thirty two (432) private primary schools (Government approved) as seen in Figure 2. Simple statistic show that the percentage of state owned primary schools stands at 72.3%, while 27.7% are government approved private primary schools. On spatial distribution of both public primary and secondary schools in the state, Figures 1, 2, and 4 show that Udung-Uko and Ibeno local government areas have the least number of primary and secondary schools, that is 8 primary schools and 1 secondary school for Udung-Uko, 9 primary and 2 secondary schools for Ibeno, respectively,

Population Size	Observed Number of Public Schools		Row
	Primary	Secondary	
At most 200,000	769	154	923
201,000 - 400,000	309	69	378
401,000 - 600,000	49	14	63
Column Total	1127	237	1364

Table 1. Dependence of Public Schools Distribution on Population

Population Size	Expected Number of Public Schools		Row
	Primary	Secondary	
At most 200,000	762	161	923
201,000 - 400,000	313	65	378
401,000 - 600,000	52	11	63
Column Total	1127	237	1364

Table 2. Expected Number of Public Schools for the Observed Number

Methods of Correlation Analysis	Coefficients of Correlation between Land Area and Distribution of Public Schools		Coefficients of Correlation between Population and Distribution of Public Schools	
	Primary Schools	Secondary Schools	Primary Schools	Secondary Schools
r	0.186	0.352	0.657	0.740
ρ	0.536	0.453	0.726	0.805

Table 3. The Values of Pearson's Coefficient of Correlation r, and Spearman's Rank Correlation ρ Obtained when Testing Hypotheses 1, 2, 3, and 4

	χ_{cal}^2	χ_{crit}^2	p	d/f
On Land Area	1.678	7.815	0.005	3
On Population	1.659	5.991	0.005	2

Table 4. Result of Chi-square for Dependency of Public Schools on Land Area and Population

while Oruk Anam has the highest number of public primary schools (75), a number far more than that of Uyo with (49). However, Uyo is the state capital city with a land area of 724 km^2 and a population of 431, 381, which is higher than that of Oruk Anam with land area of 512 km^2 and a population of 232,170. Both locations have equal number of public secondary schools of 14 each. This reveals uneven and inadequate location of public schools in the state.

The state has two hundred and thirty seven (237) public secondary schools and three hundred and seven (307) government approved private secondary schools as seen also in Figure 2. The percentage of public secondary schools owned by the state government is 43.6% of the total secondary schools in the state, while government recognized private secondary schools is 56.4%, 27% of the entire public secondary schools in the state have boarding facilities, whereas 73% are completely non-boarding. 95% of the public secondary schools are co-education, 1% of the public schools is assigned to male only, and 4% to female only. Another interesting and very important revelation of this research has made is that only 3% of the total state owned public secondary schools are technical secondary schools, while 97% of the total state government owned secondary schools are grammar schools. This is a clear evidence that technical education, which is the foundation for technological development, hence social change is not given adequate attention. Moreover, female pupils/ students are of higher chances of benefiting from the free and compulsory education policy than males. This is so because females have more schools in addition to co-educational schools than males.

The results show r_{AP} of 0.186 for the Pearson's coefficient of correlation of land area and public primary schools and r_{AS} of 0.352 being Pearson's coefficient of correlation of land area and public secondary school. r_{up} of 0.657 and r_{us} of 0.740 are the Pearson's coefficient of correlation for population and public primary schools, and that of population and public secondary schools, respectively. The results of Spearman's rank coefficient of correlation ρ for land area and public primary schools, land area and public secondary schools, population and public primary schools, and population and public secondary schools reveal $\rho_{AP} = 0.536$, $\rho_{AS} = 0.453$ $\rho_{uP} = 0.726$, and $\rho_{uS} = 0.805$, respectively. These results collaborate with those of Pearson's coefficient of correlation, showing positive linear relationship in each case. However, the degree of correlation as shown by Pearson's and Spearman's are higher in the case of population consideration than in the case of land area. Hence in all the cases, the null hypotheses in hypotheses 1, 2, 3, and 4 are rejected, while alternative hypotheses are accepted.

Also, at 0.05 level of significance with degree of freedom of

3, the calculated value of Chi-square $\chi_{cal}^2 = 1.678$ is less than the critical value obtained from Chi-square table of statistics, which is $\chi_{crit}^2 = 7.815$. Thus, the null hypothesis of hypothesis 5 is accepted. Similarly, the calculated value at the same level of significance with degree of freedom of 2 when testing hypothesis 6, shows that χ_{cal}^2 (being 1.659) < χ_{crit}^2 (being 5.991), thus the null hypothesis is upheld. The implication of the results of hypotheses 5 and 6 is that the spatial distribution of public primary and secondary schools in Akwa Ibom state, Nigeria, are not significantly influenced or caused by either land area or population.

Conclusion

In conclusion, it can be deduced from the above analysis that the numbers of government owned primary and secondary schools in Akwa Ibom state, Nigeria, are grossly inadequate to make the government policy of free and compulsory education a success. This is based on the fact that one cannot give more than he has, put it the other way one can only give what he has, therefore free and compulsory education cannot be successfully implemented in a state that has more privately owned secondary schools than government secondary schools. Logically, it can be argued that government cannot force the available private schools to compulsorily admit pupils/ students free when those privately owned institutions are operating as profit making business ventures. Equally, what would have happened to the pupils in the privately owned primary schools if the pupils in those privately owned primary schools that make up 27.7% of the total primary schools in the state were not admitted by the private schools? Whereas, privately owned secondary schools, which make up 56.4% of the total number of secondary schools in the state, admit students expected to be enjoying free and compulsory education policy in government secondary schools. This also suggests that the number of pupils/ students in the state owned schools are more than the 30 to 35 pupils/ students benchmark in a class.

Moreover, in establishing primary/ secondary schools in the state, neither population of the people which also determines the population of pupils/ students nor land area that may also determine the population is taken into consideration. For instance, Esit Eket local government area with approximately 300 km^2 land area and a population of 80,000 people have only two government owned secondary schools and this cannot sustain free and compulsory education policy.

Recommendation

Establishment of more primary and secondary schools by government should be embarked upon and such establishments should take cognizance of the population and the land area of the local government areas or villages.

It is recommended that such schools should be evenly distributed considering the population of pupils/ students to accommodate all within the school age to reduce the distance the pupils/ students have to trek to school, bearing in mind that most government schools are day schools.

Provision of school buildings and classrooms should be based on the number of pupils/ students expected to be in school at any given period to avoid overcrowding of pupils/ students. Such provisions should be based on the stipulated benchmark of 30-35 pupils/ students in a class. It should be remembered that all other indicators or educational indices cannot function without existence of schools.

More technical secondary schools should equally be established to lay foundation for technological development, promote creativity, self-employment, and job creation.

Population figure of children within school age bracket derived from birth record for each of the territories where the various schools are situated should be used for automatic placement of pupils and students in primary and secondary schools, for the successful implementation of the free and compulsory education policy of the state government.

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Appendix

Pearson's coefficient of correlation formula expressed below was employed.

$$r_{xy} = \frac{n\sum xy - \sum x \sum y}{\sqrt{\left[n\sum x^2 - \left(\sum x\right)^2\right]\left[n\sum y^2 - \left(\sum y\right)^2\right]}} \quad (1)$$

$$r_{AP} = \frac{n\sum AP - \sum A \sum P}{\sqrt{\left[n\sum A^2 - \left(\sum A\right)^2\right]\left[n\sum P^2 - \left(\sum P\right)^2\right]}} \quad (2)$$

where, A represents land area and P number of primary schools.

$$r_{AS} = \frac{n\sum AS - \sum A \sum S}{\sqrt{\left[n\sum A^2 - \left(\sum A\right)^2\right]\left[n\sum S^2 - \left(\sum S\right)^2\right]}} \quad (3)$$

where, A represents land area and S number of secondary schools.

$$r_{\mu S} = \frac{n\sum \mu S - \sum \mu \sum S}{\sqrt{\left[n\sum \mu^2 - \left(\sum \mu\right)^2\right]\left[n\sum S^2 - \left(\sum S\right)^2\right]}} \quad (4)$$

where, μ represents population and S number of secondary schools.

$$r_{\mu P} = \frac{n\sum \mu P - \sum \mu \sum P}{\sqrt{\left[n\sum \mu^2 - \left(\sum \mu\right)^2\right]\left[n\sum P^2 - \left(\sum P\right)^2\right]}} \quad (5)$$

where, μ represents population and P number of primary schools.

And for Spearman's Rank correlation coefficient the authors have derived from the general formula.

$$\rho = 1 - \frac{6\sum D^2}{n\left(n^2 - 1\right)} \quad (6)$$

$$\rho_{AP} = 1 - \frac{6\sum D_{AP}^2}{n\left(n^2 - 1\right)} \quad (7)$$

for land area and number of primary schools

where,

$$D_{AP}^2 = (R_A - R_P)^2 \quad (8)$$

and A represents land area and P number of primary schools.

Also,

$$\rho_{AS} = 1 - \frac{6\sum D_{AS}^2}{n(n^2-1)} \quad (9)$$

for land area and number of primary schools

where,

$$D_{AS}^2 = (R_A - R_S)^2 \quad (10)$$

where, A represents land area and S number of secondary schools.

$$\rho_{\mu S} = 1 - \frac{6\sum D_{\mu S}^2}{n(n^2-1)} \quad (11)$$

for land area and number of primary schools

where,

$$D_{\mu S}^2 = (R_\mu - R_S)^2 \quad (12)$$

where, μ represents population and S number of secondary schools.

$$\rho_{\mu P} = 1 - \frac{6\sum D_{\mu P}^2}{n(n^2-1)} \quad (13)$$

for land area and number of primary schools

where,

$$D_{\mu P}^2 = (R_\mu - R_P)^2 \quad (14)$$

where μ represents population and P number of primary schools.

Chi square was employed to test hypothesis 5 and 6, this was done using this statistical formula,

$$\chi^2 = \sum \left[\frac{(f_0 - f_e)^2}{f_e} \right]$$

where, f_e = expected frequency (number of public schools)

f_0 = observed frequency (number of public schools)

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