
Analyses of the Effects of Urban Population Growth on the Physical Environment of the Urban Secondary Schools in Anambra State

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ABSTRACT: *This study analyzed the effects of urban population growth on the physical environment of the urban secondary schools in Anambra State. The pursued objectives were: to determine the number of schools and staff in each selected school in the study area, determine the effects of urban population growth on the selected secondary schools in the study area and the level of significance of the effects of population growth on the physical environment of the study area. The study adopted descriptive survey research design having two well-structured copies of questionnaire been administered to two sets of the population target. Four hundred (400) copies of the questionnaire were administered and three hundred and eighty-one (381) were returned. The stratified random sampling technique was adopted in the field sampling. The analyses of the responses from the respondents show that the following are the effects of population growth on the physical environment in schools: unplanned de-vegetation occasioned by loitering students; remarkable defacing and deterioration of the school compounds and ecstatic beauty of the landscape; compounds most times littered with wastes; numerous track routes are created to alter the walkways enshrined in the school designs; presence of spillover waste receptacles; among others. The test of hypothesis showed that there is significant effect of population growth on the physical environment of the schools. The study therefore recommended that: more teachers should be employed to stabilize student to teacher ratio; formulation and implementation of legislation on the number of students a class should have and policy to control student's enrolment in line with the capacity of each school in accordance with UNESCO's recommendation of 1:25 Teacher and Students ratio. Improved infrastructural facilities to balance population increase within the schools.*

KEYWORDS: effects, urban population growth, physical environment, urban secondary schools.

INTRODUCTION

The consistency of population growth is a global challenge (UN Habitat, 2007). According to projections included in the 2016 World Population Data Sheet from the Population Reference Bureau (PRB), the global population will grow into 9.9 billion by 2050 and will hit 10 billion by 2053, which is about thirty-three percent of an estimated 7.4 billion presently (PRB, 2016). "Significant regional differences exist in the rate of population growth. For example, very low birth rates in Europe will mean population declines there while Africa's population is expected to double" (PRB, 2015; 2016).

The rise in population is likely to place greater strain on Nigeria's already strained physical and social infrastructure, and services, with increase in poverty, unemployment and political instability being inevitable. The case of Anambra state is pronounced as the three major cities (Onitsha, Nnewi and Awka) are crowded by consistent population growth as people migrate continually into these urban centers in search of better life. To contain this ever increasing population, these urban centers have sprawled into the surrounding towns, but the population pressure on social infrastructural facilities like markets, schools, hospitals and recreational facilities is a very serious challenge. Rapidly growing population necessitates large investments in social infrastructure and diverts resources from directly productive assets to other areas.

Statement of The Problem

It is very important to note that there is very little done already on the impacts of population growth on educational institutions by environmentalists. Majority of the works reviewed were those from the education researchers but this is a very big gap as the contemporary concept of environment has exceeded that of the olden day's belief which restricts it to air, land and water. The educational institution is an intrinsic component of the social environment with grave socio-economic value and its stability or instability has some environmental, health and socio-economic consequences (Osuji, 2014). A lecturer can be handling up to five hundred students in a class especially in general or inter-faculty courses. A visit to our institutions of higher learning will confirm that our learning environment is overcrowded and not conducive for learning. But according to Davis and other authors who worked in South Africa, it is impossible to learn and to teach when there are one hundred and thirty (130) learners in a class. The UNESCO standard is twenty-five (25) students per class (Davis, 2013). This area of research has been overlooked by environmental scholars leaving it for education scholars who are only interested in the implications to education and its policies, thus they rely mostly on exploratory research methods with qualitative techniques and reviews to make their assertions. Hence the need for sound empirical studies on this issue as embodied in this study.

Aim and Objectives

The aim of this study is to analyze of the effects of urban population growth on the physical environment of the urban secondary schools in Anambra State. To achieve this aim, the following objectives were pursued:

- i. to determine the number of schools and staff in each selected school in the study area,
- ii. to determine the effects of urban population growth on the selected secondary schools in the study area and
- iii. to determine the level of significance of the effects of population growth on the physical environment of the study area.

LITERATURE REVIEW

The increasing negative effects of population growth in educational institutions in Nigeria and other developing countries have prompted scholars to explore ways of managing population growth with the aim of improving quality of life and achieving sustainable living at all levels.

Effects of Population Growth on Educational Environment, Socio-Economic Environment, and Health

Adewale (2005), conducted a research on the socio-economic factors associated with urban-rural migration in Nigeria, using Oyo State as a case study. He applied the survey method in this study and

found that the index of urbanization in Nigeria which is the population increase is mainly caused by rural-urban migration and not by natural increase.

Oyeleye (2013) investigated the challenges of urbanization and urban population growth in Nigeria using the survey research method. He opined that population growth in the social and economic institutions in Nigeria urban areas is due to urbanization and its attendant high rate of rural-urban drift. According to him, there is high rural-urban drift in Nigeria because of the inequalities, in terms of infrastructural facilities, services, social amenities and heterogeneity economic activities in favour of urban centres. According to him, there is high rate of rural-urban movement in Nigeria because of three major factors: Firstly, rural areas in Nigeria are regions of backward and depressed homogenous economy with little or no formal activities, but dominated with low scale agricultural activities. Secondly, the high rate of inadequate social amenities, facilities and infrastructures like; no or epileptic power supply, poor health services, deplorable road conditions, inadequate educational facilities, poor housing conditions and zero social life inter alia. Thirdly, people migrate from rural areas based on the change of their Knowledge, Attitude and Perception (KAP) about life in rural and urban areas. The attempt of this paper is to examine the existing challenges, and predict future challenges of urbanization and urban growth in Nigeria, while measures to greatly minimize the challenges are suggested in order to ensure sustainable developments in both the Nigerian urban centres and rural areas.

Osuji (2014), in his empirical study on the “Effects of Overpopulation on the Academic Performance of Students in Government Secondary Schools in Owerri Municipal Council of Imo State”, using the descriptive survey design; highlighted the utmost desire of parents to ensure that all their wards obtains basic education at least to the secondary school level; large family sizes; lack of recreational facilities in rural areas; improper family planning; availability of infrastructural facilities in the urban secondary schools among others as factors that contribute immensely to the increase in students’ population in government secondary schools in the urban areas.

Umana (2019) in his paper on "Causes and effects of population explosion in Nigeria" found that the in addition to other causes inability to use contraceptive is a widespread practice among couples in the Northern part of Nigeria and this has great negative effects on the economy especially illiteracy and poverty.

Campbell (2020) in his paper titled "Nigeria faces a crippling population boom" after a review of the already existing situation in the country stated that "Nigeria has no population policy that would limit births, and the people of Nigeria have traditionally valued large families and the lack of birth control law has continually supported population increase making human population to outgrow available resources which has numerous negative effects to the economy and the environment. Quoting the former Chairman of the National Population Commission (NPC), Eze Duruiheoma he said "Nigerians knew that they were by far the most populous country in Africa and they were proud of it, if the trend continues like this, by the year 2050 Nigeria's population will displace the population of the United States as the third most populated country in the world after China and India.

From the above review of related literature, the following points were raised:

1. Resource Utilization Issues: Land areas, water resources, forests are over exploited. There is also scarcity of resources.

2. Inadequate fresh water for drinking, water use, as well as sewage treatment and effluent discharge.
3. Increased levels of pollution; air, water, noise, soil contamination.
4. Irreversible loss of arable land and increases in desertification. Parts of the northern Nigeria are currently suffering from encroachment of desert from the Sahara Desert.

Study Area

The study area is the three main urban centres of Anambra State, Nigeria. Awka, Nnewi and Onitsha.

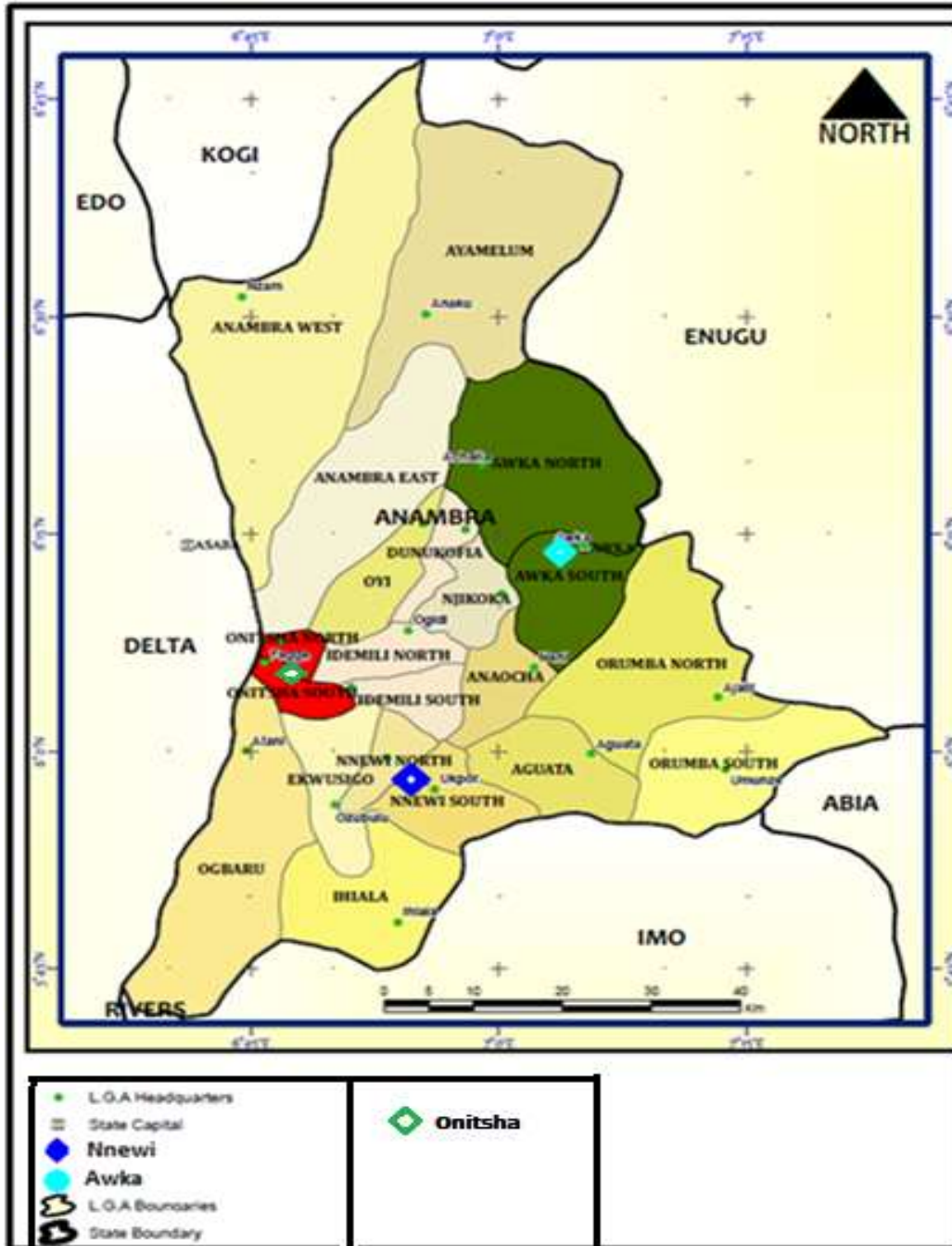


Fig. 1: Map of Anambra State Showing Awka, Onitsha and Nnewi (Source: Excel GIS Lab. Awka, 2017).

Awka and Onitsha developed as pre-colonial urban centres with Awka as the craft industrial centre of the Nri hegemony; and Onitsha, the city state on the Niger and a river port and commercial centre. Onitsha is a fast-growing commercial centre and has developed to become a huge conurbation extending to Idemili, Oyi and Anambra East Local Government Areas (LGAs) with one of the largest markets in West Africa. Nnewi is a rapidly developing industrial and commercial centre; and Awka, by becoming the state capital is, as it were, regaining its pre-colonial eminence.

The city of Onitsha is located on Latitude 9° 09 'N and Longitude 4° 47 'E. It occupies the eastern bank of River Niger covering about fifty square kilometers of land in terms of coverage.

Awka Capital Territory covering about ten kilometers in radius is located between latitudes 6°66 and 6°17^I 17^{II} North of the Equator and also between Longitude 6°55^I55^{II} and 7°8^I07^{II} East of the Greenwich 'Meridian. The area covering ten kilometers (10km) in radius occupies the middle of the eastern border of Anambra State, lies due west of Manu River which forms its eastern boundary.

Nnewi urban is located between longitudes 6°45^IE and 7°30^IE East of the Greenwich Meridian and also between latitudes 5°55^I22^{II}N and 6°52^I266^{II}N North of the Equator. It covers an area of seventy-two square kilometers, a third of which is occupied by buildings.

METHODOLOGY

The study adopted descriptive survey research design having two well-structured copies of questionnaire been administered to two sets of population target and a list of interview questions which were utilized to generate data for the analyses. Considering the objectives and data need of this study, the population of the teaching staff in the selected area, that of the students' enrolled and the number of schools becomes the target population. From the data collected from the Director of Research and Statistics at the Ministry of Education and Anambra Post-Primary School Board secretariat, Awka, the total number of public secondary schools in Anambra State are two hundred and fifty seven (257) with one hundred and fifty four (154) within Awka, Nnewi and Onitsha. The total number of teaching staff in the schools within Awka, Nnewi and Onitsha in Anambra State is three thousand two hundred and seventeen (3217) and they made up the target population. the study was sourced from both primary and secondary sources.

Considering the study area, the three major urban centres selected are incorporated into two Local Government Areas each, that is, Nnewi North and South for Nnewi, Awka North and South for Awka and Onitsha North and South for Onitsha Local Government Areas. The population for the selected urban centres is shown in Table 1:

Area	No. of LGAs	No. of Schools	No. of Tutorial Staff		
			Male	Female	Total
Awka Zone	5	62	128	1,121	1,249
Onitsha Zone	3	42	94	1,109	1,203
Nnewi Zone	4	50	105	660	765
GRAND TOTAL	12	154	327	2890	3,217

Source: Data Modified from ASUDEB and Ministry of Education, Awka

Having a total number of three thousand two hundred and seventeen (3,217) Teachers from one hundred and fifty-four (154) Secondary Schools in Awka, Onitsha and NNewi zones of the Anambra State Secondary Schools collated from the data sourced at the Anambra State Post-Primary Schools Board, Awka Office, the sample population was determined as follows”

$$SS = \frac{N}{1+N(e)^2}$$

Where N is the target population and e is 5% level of significance

Thus the sample population for the teachers is determined by the formula as:

$$\begin{aligned} SS &= \frac{3,217}{1 + 3,217 (0.05)^2} \\ &= 3,217/9.0425 \end{aligned}$$

= 355.764 approximately a total of 400 respondents were selected from the teachers and copies of the questionnaire was administered to them individually.

Four hundred (400) copies of the questionnaire were administered and three hundred and eighty-one (381) were returned.

For the number of schools sampled, fifty (50) secondary schools were selected purposively from the total number of one hundred and fifty-four (154) public secondary schools within the three zones. The location of the schools within urban centres in the three zones was the major criteria for the selection of the schools sampled.

The sampling technique adopted in selecting the teachers sampled is stratified random sampling. While purposive and snowball sampling techniques were utilized in sampling the teachers who have stayed above five (5) years in their school of assignment and a total number of sixty-six (66) teachers were sampled from the fifty (50) secondary schools purposively selected in the study area with at least one (1) teacher of this status coming from each of the fifty (50) secondary schools. Purposive sampling was also employed in determining the school heads/administrative staff who were interviewed from the fifty (50) secondary schools with at least one coming from each of the secondary schools.

PRESENTATION AND DISCUSSION OF RESULTS/FINDINGS

Presentation of Results

To analyze the effects of urban population growth on the physical environment of the schools, relevant issues to the effects of population growth on the physical environment in schools were raised and responses of the respondents are presented in Table 2

Table 2: Effects of Population Growth on the Physical Environment in Schools

S/N	The following are effects of Population growth on the physical environment of schools	SA	A	N	D	SD	Mean	Remark
1	There is unplanned de-vegetation occasioned by loitering students	7	198	102	74	0	3.36	Agree
2	There is remarkable defacing and deterioration of the school compound and ecstatic beauty of the landscape	87	206	22	60	6	3.81	Agree
3	The compound is most times littered with wastes	96	159	0	85	41	3.48	Agree
4	Numerous track routes are created to alter the walkways enshrined in the school design	91	187	71	16	16	3.84	Agree
5	There is presence of spillover waste receptacles	56	222	24	29	50	3.54	Agree
6	The school walls are frequently broken by students scaling them	51	176	19	126	9	3.35	Agree
7	There is high rate of deterioration of existing classrooms	176	111	11	79	4	3.99	Agree
8	The painted buildings are frequently stained by students	112	181	2	86	0	3.84	Agree
9	Playgrounds are de-vegetated with more areas covered with sand than the supposed grasses	69	201	39	69	3	3.69	Agree
10	Parking lots are frequently disorganized due to increased number of visitors especially at rush hours	74	212	14	70	11	3.70	Agree

Source: Researcher's Field Survey, 2022

The responses from the respondents show that all the issues raised are the effects of population growth on the physical environment in schools, that is:

- There is unplanned de-vegetation occasioned by loitering of students;
- There is remarkable defacing and deterioration of the school compounds and ecstatic beauty of the landscape;
- The compounds are most times littered with wasted;
- Numerous track routes are created to alter the walkways enshrined in the school designs;
- There is presence of spillover waste receptacles;
- The school walls are frequently broken by students scaling them;
- There is high rate of deterioration of existing classrooms;
- The painted buildings are frequently stained by students;
- Playgrounds are de-vegetated with more areas covered with sand than grasses, and
- Parking lots are frequently disorganized due to increased number of visitors especially at rush hours.
- There is no significant effect of population growth on the physical environment of the schools.

Test of Hypothesis:

H_0 : There is no significant effect of population growth on the physical environment of the schools.

Statistical Tool Used: One Sample T-Test.

Reason for choice of Tool: One level of observations was compared with a known standard.

Degrees of Freedom: 9

Decision Rule: Accept a null hypothesis if the p-value is greater than or equal to 0.05, otherwise reject it.

Test Proper: The result (output) of test is presented in Tables 3a and 3b.

Table 3a: One-Sample Statistics for Hypothesis One

	N	Mean	Std. Deviation	Std. Error Mean
Effects of population growth on the physical environment of the schools	10	3.6600	.21899	.06925

Source: Researcher's Statistical Computation, 2022

Table 4.12a contains descriptive statistics for hypothesis. It can be observed from the table that the mean of the effects of population growth on the physical environment of the schools is 3.66.

Table 3b: One-Sample Test for Hypothesis one

	Test Value = 3.0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Effects of population growth on the physical environment of the schools	9.531	9	.000	.66000	.5033	.8167

Source: Researcher's Statistical Computation, 2022

Decision and Conclusion: The p-value of the test is 0.000, which is greater than 0.05. This shows that null hypotheses will be rejected and the conclusion will be that the effects of population growth on the physical environment of the schools are significant, implying that there are significant effects of population growth on the physical environment of the schools.

Summary of the Interview Report

Purposively fifty-two (52) staff were selected and interviewed as heads of institutions with at least one (1) coming from each of the fifty (50) secondary schools that were selected for the questionnaire sampling. It is important to note that some persons were reluctant to respond to certain questions, hence this report summary was based on the responses from those who responded as was recorded in writing and with a tape recorder by the researcher and her assistant.

On the effects of population increase on your school infrastructures and the environment, fifty (50) responses were clearly recorded with thirty-two (32) stating that population increase is a major cause of the environmental and infrastructural deterioration. While sixteen (16) of them said that there is very poor maintenance of the already existing infrastructure and new ones are supposed to be added over time as population increases. Two (2) persons were actually insisting that most of their available infrastructures are obsolete and needs urgent upgrade whether or not there is increase in population.

CONCLUSION AND RECOMMENDATION

The responses from the respondents show that the following are the effects of population growth on the physical environment in schools. There is unplanned de-vegetation occasioned by loitering students. There is also remarkable defacing and deterioration of the school compounds and ecstatic beauty of the landscape. The compounds are most times littered with wastes. Numerous track routes are created to alter the walkways enshrined in the school designs. There is presence of spillover waste receptacles. The school walls are frequently broken by students scaling them. There is high rate of deterioration of existing classrooms as the painted buildings are frequently stained by students. Playgrounds are de-vegetated with more areas covered with sand than the supposed grasses. The parking lots are frequently disorganized due to increased number of visitors especially at rush hours. It was also found that there is significant effect of population growth on the physical environment of the schools. The study therefore recommended as follows:

1. More teachers should be employed to increased number of teachers in each class.
2. There is need for legislation on the number of students a class should have and efforts should be made to implement it to the later.
3. Formulate a policy to control student's enrolment in line with the capacity of each school and ensure full implementation.
4. The government and educationists should adhere to United Nations Education, Scientific and Cultural Organization (UNESCO's) recommendation of 1:25 Teacher and Students ratio. Also old schools' structures should be renovated and new ones constructed to contain the growing population and enhance the academic performance.

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