

# Managing School Plant Planning for Climate Change in Public Secondary Schools in Rivers State, Nigeria: A Prerequisite for the Attainment of Sustainable Educational Development

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DOI: [10.36348/jaep.2023.v07i11.004](https://doi.org/10.36348/jaep.2023.v07i11.004)

| Received: 03.10.2023 | Accepted: 07.11.2023 | Published: 16.11.2023

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## Abstract

This study examined managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State. Two research questions and two hypotheses guided the study. The descriptive design was adopted. The population of the study comprised all the 542 public junior and senior secondary schools in Rivers State. A sample of 304 principals representing 56% of the population served as the study respondents. This sample was selected using the stratified random sampling technique. A validated Likert-modified 4-scale 16 item instrument titled: 'Managing School Plant Planning for Climate Change in Public Secondary Schools Questionnaire (MSPPCCPSSQ)' was used for data collection and its reliability coefficient was established at 0.82 using the Cronbach Alpha Correlation coefficient. Mean and standard deviation were used to analyze the research questions while the z-test statistics was used to test the hypotheses at 0.05 level of significance. The findings of this study revealed that discouraging deforestation while encouraging afforestation where trees acting as wind breakers are planted; communicating effectively with students by promoting students' engagements by means of enlightening students on the importance of respecting green spaces such as school gardens, parks are some of the ways of managing school plant planning for climate change in the attainment of sustainable educational development in public secondary schools in Rivers State, Nigeria. Based on these findings, the researcher recommended that Rivers State government should endeavor to champion the course of initiating proactive ways and policies in managing school plant planning for public secondary schools aimed at curbing the negative effects of climate change in Rivers State.

**Keywords:** Plant, Climate, Sustainability, Planning.

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## INTRODUCTION

Education for sustainable development can be referred to as education that encourages changes in knowledge, skills, values, and attitudes aimed at enabling a more viable and just society for all. This implies that the attainment of sustainable development for any nation, Nigeria inclusive, is undoubtedly 'shouldered' by her educational system. The Nigerian educational system is such that has evidently, undergone restructuring and revitalization at different times. This infers that there have been several attempts to constantly reform the Nigerian educational system in line with achieving the global goal of education which objectively, is self-reliance. These restructuring however, prompted the

stratification of the Nigerian educational system into three (3) specific main levels – the primary, secondary and tertiary levels of education. Broadly, the Nigerian educational system takes into cognizance, the basic and post-basic education. The basic education comprises the pre-primary, primary and junior secondary education while the post-basic education encompasses the senior secondary education, higher school and continuing education (Federal Republic of Nigeria, 2014). Nonetheless, the focus of this study, is on the secondary level of education.

Buttressing the afore-stated, Ejiogun, Onyene and Egbagbara (2017) described secondary level of

education as that level where learners are prepared for integration into the mainstream of the society while also serving as the bedrock on which higher education is built. Nevertheless, it is a known fact that secondary schools in Nigeria are either government-owned or private individual-owned hence, the existence of both public and private secondary schools in Nigeria. Albeit, with regards to Rivers State, all public secondary schools in the state are owned by the Rivers State government. Nevertheless, ownership of secondary schools notwithstanding, in order for secondary education to adequately prepare its recipients for useful living and improved learning experiences vis-à-vis the attainment of sustainable educational development, several literatures have revealed school plant as one determining factor that should be provided and utilized.

Amanchukwu and Nwachukwu (2019) stated that school plant is an ‘umbrella’ covering all buildings, machineries and facilities located in the area of a school used either by students or directly, to support the school. Corroborating the above definition of school plant, Ajayi (2017) and Yusuf (2018) defined facilities as the entire school plant such as blocks of classrooms, staff rooms, laboratories, workshops, visual aids, electricity, water, chairs, tables, stationeries, playground, storage spaces and others which a school has. Furthermore, both authors acknowledged that school site, which is the landscape on which the school’s permanent and non-permanent structures are built, are part of school plant.

Yusuf (2018), defined school plant planning as a process in which a suitable site is selected and instructional space, administrative space, circulation space, and spaces of convenience are designed to facilitate the teaching and learning process in the school system. In a similar vein, Ali and Ajibola (2019) referred to school plant planning as a process in which a congenial site is selected and appropriate structures (buildings) designed and constructed to satisfy the identified educational needs of the students.

In the same vein, Okenwa and Igbo (2018) described managing school plant planning as a series of processes and services rendered, to ensure that all the semi-structured and permanent items of schools are in good condition in order to achieve the expected quality. According to Musa and Vincent (2022), managing school plant planning is an essential task in the day-to-day operation of the school. It entails good leadership, effective monitoring of both the users and the plant itself; applying sound maintenance culture of those facilities and other things required for the school plant to give maximum services (Amanchukwu & Nwachukwu, 2019). Reviewing the foregoing, it is clear that managing school plant is imminent and crucial. This is because it fosters and increases the life span of the school plants, reduces operation costs, and motivates a culture of high-quality experience for staff and students.

Basically, according to Ukaga (2019), climate change can be defined as the average weather condition (temperature, rainfall, humidity, solar radiation, cloud and wind) of a particular geographic region over a period of time such as 25-30 years. The author further maintained that climate involves variations in interaction among different physical components of man’s environment such as the atmosphere, the oceans, sea, ice, and land features which make up the climate system components whether they are from internal or external forces. Nonetheless, in support of the above, UNESCO noted that since the 1800s, human activities have been the main driver of climate change primarily due to the burning of fossil fuels (like coal, oil and gas) producing heat-trapping gases.

It is noteworthy that climate change as a global issue affects Nigeria including her states with Rivers state not an exception. According to Ogele (2020), the factors contributing to climate change include gas flaring, deforestation and artisanal refinery. The author further identified excessive heat, thunder storm, stormy winds, increase in temperature (excess heat), public health, food security, flooding, erosion, forced migration and displacements as the effects of climate change in Rivers state. Other effects of climate change include more severe storms, increased drought, loss of species, food shortage, and more health risks; amongst others. Reviewing the foregoing however, it can be deduced that climate change affects the rights to freedom, a peaceful and safe environment for the inhabitants of Rivers state irrespective of their institutions. This implies that particularly in communities domiciled in the den of oil exploration, climate change has an adverse effect on all institutions including learning institutions with particular reference to public secondary schools in the state therefore, the need to adopt some health measures to guide the affairs of schools in the state. To this effect, managing school plant planning in public secondary schools could be adopted.

Nwachukwu (2017) stated that the safest health measures to be taken in schools for climate change include proper care of buildings, advocating for proper number of lights, effective ventilation, and ‘attractive’ furniture. Other significant considerations include ample supplies of safe drinking water; accident-free and clean playfields; adequate storage facilities, especially first aid boxes and other health facilities; and control measures for food hygiene (Ogele, 2020). It is noteworthy however that if school plants are not managed appropriately to slow down the effects of climate change, the purpose for which schools were established particularly for the attainment of sustainable educational development, will not be realized.

Nevertheless, in the course of managing school plant planning for climate change, studies have revealed that challenges are paramount. These challenges pose as shortcomings or barriers to the possible ways school

plant planning can be managed for climate change. Baradari and Omer (2021) noted that school principals are faced with some challenges including the challenge of technical-know-how, constrained financial resources, lack of cooperation from parents, government policies, and community members' non-compliance to procedures; amongst others. Similarly, as postulated by Amanchukwu and Nwachukwu (2019), the following are some of the challenges of managing school plant planning for climate change – lack of funds, lack of cooperation among school stakeholders, feasibility of laid down curbing strategy (ies), availability of resources, organizational structure, processes, unfavourable policy, lack of government support, poor teamwork and poor communication.

### Statement of the Problem

Climate change has become a disturbing global issue due to its attendant negative impacts on humanity. World bodies and countries at varied settings have deliberated and made some predictions of increase in extreme climate events such as unusual storms, flood, changing pattern of rainfall, strong winds, drought and tidal waves in Africa. These adverse effects of climate change are already evident with the developing countries being more vulnerable. Sometimes ago particularly in 2012, 2016, 2020 and 2022, various parts of Nigeria including Rivers state experienced massive flooding. Some Local Government Areas like Obio/Akpor, Ahoada-West, Ikwerre and Oyigbo had some of their secondary schools flooded, and their buildings collapsed such that school records, instructional materials and farmlands were damaged. This resulted into the affected schools being forced to close for a long period of time. In the light of this situation and several predictions of extreme climate effects from world bodies such as WHO, UNESCO and UN in the coming years, the researcher therefore seeks possible ways of managing school plant planning in the face of climate change. This paper therefore aimed at examining managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State.

### Aim and Objectives of the study

The aim of this study was to examine the ways managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers state. Specifically, the objectives of the study were to:

1. Ascertain the ways school plant planning can be managed for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State.
2. Identify the challenges of managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State.

### Research Questions

The following research questions guided the study:

1. In what ways can school plant planning be managed for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State?
2. What are the challenges of managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State?

### Hypotheses

The following hypotheses tested at 0.05 level of significance guided this study:

H0<sub>1</sub>: There is no significant difference between the mean ratings of male and female principals on the ways school plant planning can be managed for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State.

H0<sub>2</sub>: There is no significant difference between the mean ratings of experienced and less experienced principals on the challenges of managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State.

### METHODOLOGY

This research adopted the descriptive survey design. The study was conducted in public secondary schools in Rivers State, Nigeria. The population of the study encompassed all the public secondary schools in Rivers State comprising 542 principals (328 male and 214 female principals; 385 experienced and 157 less experienced principals) (Source: Rivers State Ministry of Education, 2022). A sample size of 304 principals (201 males and 103 females; 127 experienced and 177 less experienced principals) representing 56% of the population was selected using the stratified random sampling technique. A 16 item 4-point Likert type scale researcher-structured questionnaire titled 'Managing School Plant Planning for Climate Change in Public Secondary Schools Questionnaire (MSPPCCPSSQ)' was validated and used for data collection. A reliability index of 0.82 was established using the Cronbach Alpha Coefficient. Mean scores and standard deviation were used to answer the research questions while z-test statistics was used to test the hypotheses at 0.05 level of significance.

### RESULTS

**Research Question 1:** In what ways can school plant planning be managed for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State?

**Table 1: Weighted mean scores and standard deviation of the responses of male and female principals on the ways school plant planning can be managed for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State**

S/N	Ways school plant planning can be managed for climate change	Male Principals = 201		Female Principals = 103		Mean set $(\bar{x}_1 \bar{x}_2)$	Rank	Remarks
		$\bar{x}_1$	SD <sub>1</sub>	$\bar{x}_2$	SD <sub>2</sub>			
1	Prioritizing the relationship between wellbeing and learning by providing an alternative safe and predictable learning environment when necessary	3.35	1.42	3.42	1.58	3.39	4 <sup>th</sup>	Accepted
2	Understanding the context and responding rapidly to all identified climate change concerns in schools by creating and intensifying monitoring processes including ensuring refuse are properly recycled or disposed, disallowing of poor drainage system for those concerns	3.81	1.72	3.26	1.35	3.54	2 <sup>nd</sup>	Accepted
3	Discouraging deforestation while encouraging afforestation where trees acting as wind breakers are planted	2.99	1.22	2.06	1.20	2.53	7 <sup>th</sup>	Accepted
4	Communicating effectively with students by promoting students' engagements by means of enlightening students on the importance of respecting green spaces such as school gardens, parks	3.57	1.55	3.41	1.44	3.49	3 <sup>rd</sup>	Accepted
5.	Encouraging communities where schools are situated to implement climate-smart agriculture and nurture forest landscapes	3.11	1.27	2.03	1.21	2.57	6 <sup>th</sup>	Accepted
6.	Ensuring emissions from school plants such as generators are at its lowest	3.33	1.39	1.91	1.26	2.62	5 <sup>th</sup>	Accepted
7.	Reframing and restructuring classroom approaches including ensuring LED lights are used, fans work, prioritizing less use of oil paints to prevent heat for all students	3.18	1.31	1.86	1.31	2.52	8 <sup>th</sup>	Accepted
8.	Constantly organizing brainstorming meetings among stakeholders – parents, government, community heads, non-governmental organizations to constantly seek ways forward for public schools against climate change	3.86	1.76	3.58	1.55	3.72	1 <sup>st</sup>	Accepted
		27.20	11.64	21.53	10.88	24.40		
	<b>Aggregate Mean</b>	<b>3.40</b>	<b>1.46</b>	<b>2.69</b>	<b>1.36</b>	<b>3.05</b>		

Result from table 1 above shows that all the items; 8, 2, 4, 1, 6, 5, 3 and 7 have weighted mean scores above 2.50 hence, were all adjudged as the ways school plant planning can be managed for climate change in the attainment of sustainable educational development for public secondary schools in Rivers state. Consequently, the aggregate weighted mean score of 3.05 indicates that male and female principals agreed to all the items as the ways school plant planning can be managed for climate

change in the attainment of sustainable educational development for public secondary schools in Rivers state.

**Research Question 2:** What are the challenges of managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State?

**Table 2: Weighted mean scores and standard deviation of the responses of experienced and less experienced principals on the challenges of managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State**

S/N	Challenges of managing school plant planning for climate change	Experienced principals = 127		Less experienced principals = 177		Mean set $(\bar{x}_1 \bar{x}_2)$	Rank	Remarks
		$\bar{x}_1$	SD <sub>1</sub>	$\bar{x}_2$	SD <sub>2</sub>			
9	Capacity of administrative staff	1.99	1.22	1.35	1.60	1.67	7 <sup>th</sup>	Rejected
10	Government policies	3.53	1.52	3.15	1.29	3.34	6 <sup>th</sup>	Accepted
11	Lack of availability and accessibility to fund	3.54	1.53	3.47	1.48	3.51	4 <sup>th</sup>	Accepted
12	Lack of adequate information and awareness on school plant planning processes	1.81	1.31	1.51	1.49	1.66	8 <sup>th</sup>	Rejected
13	Cultural problem	3.76	1.68	3.60	1.57	3.68	2 <sup>nd</sup>	Accepted
14	Lack of adequate support from key stakeholders	3.63	1.59	3.45	1.47	3.54	3 <sup>rd</sup>	Accepted
15	Manpower problem	3.58	1.55	3.38	1.42	3.48	5 <sup>th</sup>	Accepted
16	Resistance to change	3.80	1.71	3.60	1.57	3.70	1 <sup>st</sup>	Accepted
<b>Aggregate Mean</b>		<b>25.64</b>	<b>12.08</b>	<b>23.52</b>	<b>11.92</b>	<b>24.56</b>		
		<b>3.21</b>	<b>1.51</b>	<b>2.94</b>	<b>1.49</b>	<b>3.07</b>		

The result on table 2 above reveals that items 10, 11, 13, 14, 15 and 16 with mean scores 3.34, 3.51, 3.68, 3.54, 3.48 and 3.70 respectively were accepted by principals as the challenges of managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State. Items 9 and 12 with mean scores of 1.67 and 1.66 respectively, were however rejected as the challenges of managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State. Nevertheless, the aggregate mean score of 3.07 above the criterion mean

score of 2.50 indicates that both experienced and less experienced principals of public secondary schools in Rivers State accepted that there are challenges militating against managing school plant planning for climate change.

**Test of Hypotheses**

H0<sub>1</sub>: There is no significant difference between the mean ratings of male and female principals on the ways school plant planning can be managed for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State

**Table 3: z-test analysis on the mean ratings of male and female principals on the ways school plant planning can be managed for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State**

Category	n	$\bar{x}$	SD	Df	z-cal.	z-crit.	Remarks
Urban	201	3.40	1.46	302	4.46	1.96	significant
Rural	103	2.69	1.36				

Sequel to table 3, with a degree of freedom of 302, the z-calculated value of 4.46 is greater than the z-critical value of 1.96 at 0.05 alpha level of significance hence, the null hypothesis is rejected. This indicates that there is a significant difference between the mean ratings of male and female principals on the ways school plant planning can be managed for climate change in the

attainment of sustainable educational development for public secondary schools in Rivers State.

H0<sub>2</sub>: There is no significant difference between the mean ratings of experienced and less experienced principals on the challenges of managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State.

**Table 4: z-test analysis on the mean ratings of experienced and less experienced principals on the challenges of managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State**

Category	n	$\bar{x}$	SD	Df	z-cal.	z-crit.	Remarks
Male	127	3.21	1.51	302	2.08	1.96	significant
Female	177	2.94	1.49				

Table 4 above showed that with a degree of freedom of 302 and at an alpha significant level of 0.05, the z-calculated value of 2.08 is greater than the z-critical value of 1.96. This means that the null hypothesis was rejected. By implications, there is a significant difference between the mean ratings of experienced and less experienced principals on the challenges of managing school plant planning for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State.

## DISCUSSION OF FINDINGS

The findings from research question one revealed that prioritizing wellbeing and learning by providing an alternative safe and predictable learning environment; understanding the context and responding rapidly to all identified climate change concerns in schools by creating and intensifying monitoring processes including ensuring refuse are properly recycled or disposed, disallowing of poor drainage system for those concerns; discouraging deforestation while encouraging afforestation where trees acting as wind breakers are planted; communicating effectively with students by promoting students' engagements by means of enlightening students on the importance of respecting green spaces such as school gardens, parks; encouraging communities where schools are situated to implement climate-smart agriculture and nurture forest landscapes; ensuring emissions from school plants such as generators are at its lowest; reframing and restructuring classroom approaches including ensuring LED lights are used, fans work, prioritizing less use of oil paints to prevent heat for all students and constantly organizing brainstorming meetings among stakeholders – parents, government, community heads, non-governmental organizations to constantly seek ways forward for public schools against climate change are the ways school plant planning can be managed for climate change in the attainment of sustainable educational development for public secondary schools in Rivers State.

Albeit, a corresponding result from hypothesis one revealed that there is a significant difference between the mean ratings of male and female principals on the ways school plant planning can be managed for climate change in the attainment of sustainable educational development in public secondary schools in Rivers state. These findings above imply that the respondents agreed to the ways school plant planning can be managed for climate change. In support of the above findings and implications, Baradari and Omer (2021) noted that the effects of climate change can particularly be negative having yet, a negative effect on plants in schools including students thereby slowing if not, especially when consistent, suspending the attainment of sustainable educational development in Nigeria hence, several ways of managing school plants including sitting schools in areas of less climate change effects, use of less transportation in areas close to schools thereby reducing

the burning of fossils and discouraging of bush burning should be embraced as ways of managing school plant planning for climate in schools.

The finding from research question two revealed that respondents agreed to resistance to change, lack of adequate support from key stakeholders, cultural problem, lack of availability and accessibility to fund, government policies and manpower problem are the challenges militating against managing school plant planning for climate change in the attainment of sustainable educational development in public secondary schools in Rivers State. Nevertheless, the respondents rejected capacity of administrative staff, lack of adequate information and awareness on school plant planning processes as the challenges of managing school plant planning for climate change in the attainment of sustainable educational development in public secondary schools in Rivers State.

Similarly, a corresponding hypothesis finding established a significant difference between the mean ratings of experienced and less experienced principals on the challenges of managing school plant planning for climate change in the attainment of sustainable educational development in public secondary schools in Rivers State. These findings however agree with the findings of Musa and Vincent (2022) in their study on the challenges of school plant management that the processes of managing school plants are subject to internal and external challenges including resistance from some school staff and communities, lack of adequate information and administration of practices, lack of resources to effectively manage school plants amongst others.

## CONCLUSION

This study revealed that climate change has created global concern because of its negative impacts. The education sector is however not left out in this source of global concern especially as it (climate change) affects the school plant which is an important aspect of the school environment. This implies that climate change poses as a threat to the education sector hence, the need to manage school plant planning in order to curb or to a large extent, adapt to the effects of climate change in public secondary schools in Rivers State aimed at attaining sustainable educational development.

## RECOMMENDATIONS

1. Rivers State government should endeavor to champion the course of initiating proactive ways and policies in managing school plant planning for public secondary schools with regards to curbing the negative effects of climate change in Rivers State.
2. Principals, teachers and other educational stakeholders of public secondary schools, should ensure that they tackle absolutely or to

its minimal, those challenges that could militate against the ways of managing school plant planning for climate change in public secondary schools in Rivers State.

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