

## Impact Of Climatic Change On Secondary School Administration In Bayelsa State

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### **Abstract**

The study examined the impact of climatic change on secondary school administration in Bayelsa State. Three research questions and two null hypotheses guided the study. Ex-post-facto research design was used for the study. The population of the study was 501 principals of government secondary schools. The population size (501) was manageable by the researchers so there was no sample. A self-developed instrument containing 21 items titled Climatic Change Impact Questionnaire (CCIQ) questionnaire was used for data collection. The data generated from the trial testing were analyzed using Cronbach Alpha statistics at 0.75, 0.80, and 0.79 for clusters A, B and C respectively, the overall reliability coefficient for the instrument was 0.85. Mean and standard deviation were used to answer the research questions, while t-test was used to test the null hypotheses. The major findings were that climatic change has great extent of impact on students learning in secondary schools in the areas of students' transportation to school, displacement of student, and spread of diseases in classrooms among others. The findings further showed that climatic change affects secondary school educational facilities such as the school libraries, laboratories, desks and chairs, the school buildings and the playgrounds, also principals get little extent of financial aid to cushion climatic change impact on educational facilities. Based on the findings for the studies the following recommendations were made; that climatic change adaptive measures should be put in place in all schools to help

prevent direct effects of climatic change on students, also with the severity of climatic change events happening all over, state governments through various state ministries of education should set funds aside to cushion climatic change effect on schools among others.

## **Introduction**

Climate is an area's long-term weather patterns. It could be described as the average temperature and precipitation of an area over time. According to the American Meteorological Society (AMS) (2011), it is the average weather condition of a place taken over a prolonged period of time. It is the statistics of temperature, humidity, pressure, wind, rainfall, sunshine intensity, particle count and other meteorological elemental measurements in a given region over a long period of time, usually 30years and above(Intergovernmental Panel on Climate Change (IPCC), 2007).While weather is the present atmospheric condition such as the intensity of sunshine and amount of rainfall for the day, climate is the average of these meteorological elements collected over a very long period of time.In this study, climate is the regular pattern of weather conditions of a particular place. A drift in the regular weather pattern causes climate change.

United Nations on Environmental Programme,(UNEPA)( 2008), defined climate change as extreme reactions of the weather phenomenon which creates negative impact on agricultural resources, water resources, human health, depletions of ozone layer, vegetations, soil and doubling of Co<sub>2</sub> in the ecosphere.Udenyi (2010) opined that climate change is simply a change in the climate condition of the world and that the change is found by the scientists and others to be on the negative.Climate change is the significant and lasting variation in the statistical properties of the average weather system when considered over long periods of time, regardless of

cause (IPCC, 2001). Climatic change is the complete variation or average state of the atmosphere over time scale ranging from decades to millions of years in a region or across the entire globe which can be caused by processes internal to the earth, external forces from space (e.g. variations in sunlight intensity) or, human activities (Odjugo, 2008). In this study, climate change is seen as the change in weather condition of an area that is caused by human activities and natural events.

Climatic change can be described as the biggest environmental issue of our time. It is a topical issue worldwide because of its attendant problems that are threatening the sustenance of man and his environment. The effects of climate change are particularly becoming more severe in the under-developed and developing countries (Ekpoh, 2009). Climatic change has become the new reality of our time. It brings with it changes in weather patterns that can have serious repercussions on human beings by upsetting seasonal cycles, harming ecosystems and water supply, affecting agriculture and food production, causing sea-levels to rise among others. The causes of climate change have been attributed mostly to human activities. For the past decades, human activities such as urbanization, deforestation, population explosion, industrialization and the release of greenhouse gases are the major contributing factors to climatic change (Odjugo, 2010).

Nigeria's economy depends largely on natural resources (crude oil) which is richly deposited in the Niger Delta region. The Niger Delta region of Nigeria is reported to have over 123 gas flaring sites making Nigeria one of the highest emitters of greenhouse gases (GHGs) in Africa (Thaddeus, Chukwudumebi, Nnaemeka and Victoria, 2011). A study by the World Bank (2008) revealed that Nigeria accounts for roughly one-sixth of worldwide gas flaring. For instance, Nigeria flares about 75% of her gas and all take place in the Niger Delta region. The activities of gas flaring has resulted in

the depletion of the ozone layer which in turn has resulted to sea-level rise, killer flooding, water salination, and increase in rainfall among others (Ekpoh and Ekpoh, 2011). The impact could manifest in food security challenges, damage to infrastructure, social dislocation and educational activities.

Education is what each generation gives to its younger ones, which makes them to develop attitudes, abilities, skills and other behaviours which are of positive value to the society in which they live (Amaele, 2003). Education is a process of initiating the child into cherished norms and skills, designed and implemented by the mature or adult members of the society to effect the desired changes in the younger or less matured ones, from generation to generation. It is as a result of its importance that the Federal Government of Nigeria, in her National Policy on Education (2004), organized education into pre-primary education, primary education, secondary education and tertiary education.

Secondary education is the education children receive after primary education and before tertiary education (Federal Republic of Nigeria, 2004). It is the education given to children between the ages of 12 – 18 (Oboegbulem and Onwurah, 2011). It is splitted into two parts, three years junior secondary school (JSS) and three years senior secondary school (SSS). The importance of secondary education made the federal government to state the broad aims of secondary education as preparation for useful living within the society and for higher education. To achieve the aims of secondary education, an effective administrative team has to be in place to pilot its affairs. As part of its duties, the school administration is to create a safe learning and healthy school environment for both the teachers and students for effective teaching and learning (The Wallace Foundation, 2013).

In Nigeria, education sector is one of the most affected areas by climatic change events. According to Das (2010), Climatic change has its ways of affecting the smooth administration of education especially, in the areas of destruction of school buildings, school facilities, obstruction of academic programmes, students and staff health, school transportation and impeding the receipt of educational materials from central authorities. Ekpoh (2009) further explains that climatic change impacts brings threat to human health as rising temperature could bring about diseases such as chronic heat rashes, Cerebra-Spinal Meningitis (CSM), stroke, malaria and other related diseases that could have effects on students.

The 2012 flood disaster in Bayelsa state is as a result of climatic change and it brought educational activities to a standstill. Children who were supposed to be in school were at various refugee camps seeking shelter. As critical as the impact of climatic change is, it is not clear if it has effects on the effective administration of secondary schools in Bayelsa State. It is against this background that the researchers seeks to find out the impact of climatic change on secondary school administration in Bayelsa state.

### **Statement of the Problem**

Climatic change is no doubt one of the most important environmental issues facing the world today. This is evidenced by the spate of conferences, campaigns, reports and researches on climatic change in the past two decades. Presently, there is widespread consensus in the scientific community and even among politicians in Nigeria that climatic change is causing a lot of damage to our educational system and that the impacts are already present in our environment. Climatic change phenomenon has serious deleterious consequences on the earth in the form of significant variations in regional climates, recurrent droughts, excessive heat waves, windstorms, killer floods, among others. There are noticeable consequences

of climate change in Nigeria such as intense thunderstorms, widespread floods, incessant droughts, water salination, and desertification, among others.

Recently in 2012, some states in Nigeria experienced flooding which had negative effect on their economy, political and social activities. This made some schools to suspend academic activities for months in some states. School plants in various states were affected. In Bayelsa state, displaced community members used school desks and chairs for fire woods, schools became refugee camps; students, parents and even teachers were displaced. With all these consequences, pressure is still on secondary school principals for effective administration of secondary schools. Notwithstanding this, there have been warnings from meteorologists about flooding that could be worse in the coming years compared to the 2012 flooding. As a result there is doubt in achieving effective school administration of secondary schools by principals amidst climatic change phenomenon.

### **Purpose of the study**

The main purpose of this study is to investigate the impact of climatic change on secondary school administration in Bayelsa state. Specifically, the study seeks to:

1. Ascertain the extent of climatic change have impact on students' learning in secondary schools in Bayelsa state.
2. Determine the extent climatic change have impact on secondary school educational facilities.
3. Determine the extent to which principals of secondary schools receive financial aids to ameliorate climatic change impacts on educational facilities.

### **Research questions**

The following research questions were stated to guide the study:

1. To what extent do climatic change have impact on students' learning in secondary schools in Bayelsa State?
2. To what extent do climatic change have impact on secondary school educational facilities in Bayelsa State?
3. To what extent do principals receive financial aid to ameliorate climatic change impacts on educational facilities?

### **Hypotheses**

The following null hypotheses were formulated to guide the study and was tested at 0.05 level of significance.

**HO<sub>1</sub>** There is no significant difference between the mean rating scores of principals in lowland and upland areas on the extent of climatic change have impact on students' learning in secondary schools.

**HO<sub>2</sub>** There is no significant difference between the mean rating scores of principals in lowland and upland areas on the extent climate change have impact on secondary schools' educational facilities.

### **Research method**

The study adopted ex-post-facto research design. According to Nworgu (2006), ex-post-facto research design is a design in which the researcher attempts to link some already existing effects or observation to some variables as causative agents. This design was considered appropriate for this study since the researchers are not interested in the manipulation of variables.

The study was carried out in Bayelsa State. Bayelsa State is located in the Niger Delta Region, South/South of Nigeria. It is bordered by Rivers State to the East, Delta State to the West, both Delta State and Rivers States to the North and the Atlantic Ocean to the South. Bayelsa State is made up

of eight local government areas, they are: Yenagoa, Kolokuma/Opokuma, Sagbama, Ekeremor, Southern Ijaw, Ogbia, Brass and Nembe local government areas. All the local government areas have most of their communities in the creeks (lowland areas) and few communities are accessible with the aid of motor cars, vans and motor cycles (upland areas). It has almost the largest supply of crude oil which is the main stay of the Nigerian economy, hence the heavy presence of oil exploration companies such as Shell Petroleum Development Company (SPDC), Nigerian Agip Oil Company (NAOC), Chevron, and Mobil, among others. Besides these, there are a number of servicing companies such as Willbros, Saipem, Panalpina, among others, hence the heavy gas flaring in the area. The state was one of the most affected states in the 2012 flood disaster.

The population of the study consisted of 501 government secondary school principals and vice principals (administration and academics). This is made up of 167 principals, 167 vice principals' academics and 167 vice principals' administration (source: Bayelsa State Senior Secondary Schools' Board, September, 2013). In order to attain a sizeable number of population for the study, the principals and vice principals were merged to form the final figure (501). Due to the narrow size of the population of the study, the researcher considers the population size manageable. Therefore, there was no sample in the study.

A 21 item questionnaire generated by the researchers titled "Climatic Change Impact Questionnaire" (CCIQ) was used to collect data. The questionnaire was divided into two parts (I & II). Part I was designed to collect bio data information, while part II has 20 items which collected information on impact of climatic change on secondary school administration in Bayelsa State based on the specific purposes of the study and is divided into three clusters (A-C). Each item has a four point response

scale of Very Great Extent (VGE), Great Extent (GE), Little Extent (LE) and Very Little Extent (VLE) weighted 4, 3, 2, and 1 respectively. Cluster A addressed the impact of climatic change on students' learning in secondary schools, cluster B addressed the impact of climatic change on educational facilities, and cluster C finds out if there has been financial aid to cushion the effect of climatic change on educational facilities.

The research instrument was subjected to face validation by three experts; two from Educational Administration and Planning in the Department of Educational Foundations, and one from Science Education (Measurement and Evaluation) all in the Faculty of Education, University of Nigeria, Nsukka. The validates were asked to read and correct statements with respect to clarity, sentence construction, and suitability of items. However, the validates made suggestions for the improvement of the instrument. Their corrections and suggestions were used to produce the final copy of the instrument.

In order to ascertain the reliability of the instrument for the study, 20 copies of the instrument were trial tested in secondary schools in Delta State which is outside the study area which has similar environmental conditions. The questionnaires administered were retrieved and analyzed using Cronbach Alpha procedure to determine the internal consistency of the instrument. From the analysis, the reliability coefficient for clusters A, B and C were 0.75, 0.80 and 0.79 respectively, while the overall reliability coefficient obtained was 0.85.

A total number of 501 questionnaires were administered to the respondents by the researchers with the help of two research assistants. The research assistants were instructed on how to distribute and collect the copies of the completed questionnaires.

The data collected from the respondents were analyzed using mean and standard deviation to answer the research questions while t-test was used to test the null hypotheses at 0.05 level of significance. Any item with a mean value ranging from 3.50 – 4.00 were interpreted as Very Great Extent, 2.50 – 3.99 as Great Extent, 1.50 – 2.99 as Little Extent while any item with a mean value 0.50 – 1.99 were interpreted as Very Little Extent. In taking decision, any item from 2.50 and above will be considered great extent, while any item below 2.50 is considered little extent.

**Research question 1:** To what extent does climatic change have impact on students’ learning in secondary schools in Bayelsa State?

**Table 1**  
**Mean Ratings of Principals in Lowland and Upland Areas of Bayelsa State on Climatic Change Impact on Students’ Learning in Secondary Schools.**

S/ N o.	Items The extent climatic change have impact on students learning in secondary schools.	Principals (n=501)							
		Lowland Principals (n=348)			Upland Principals (n=158)				
		$\bar{X}_1$	SD <sub>1</sub>	Dec <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>	Dec <sub>2</sub>		
1	Excessive rainfalls and flooding affects the transportation of students to school	3.45	0.61	GE	3.68	0.60	VGE		
2	Excessive heat affects students’ assimilation rate in academic activities.	3.57	0.60	VGE	3.41	0.63	GE		
3	Extreme heat affects students’ comfortability in classrooms	3.60	0.64	VGE	3.58	0.65	VGE		
4	Extreme heat helps in easy spread of diseases in classrooms	3.34	0.63	GE	3.31	0.63	GE		
5	Displacement of students during excessive flooding events affects students’ learning in school.	3.67	0.64	VGE	3.55	0.54	VGE		
6	Excess rainfalls and flooding affects students’ school attendance rate	3.79	0.58	VGE	3.54	0.55	VGE		

Table 1 above presents the mean responses of principals in lowland and upland areas of Bayelsa state on climatic change impact on students learning in secondary schools in Bayelsa state. Principals in lowland areas rated items 1 and 4 as Great Extent and items 2, 3, 5, and 6 as Very Great Extent. While principals in upland areas rated items 1, 3, 5 and 6 as Very Great

Extent and items 2 and 4 as Great Extent. This shows that both groups of respondents agreed that climatic change has impact on the students learning in secondary schools in Bayelsa state to a great extent.

**Research question 2:** To what extent do climatic change have impact on secondary school educational facilities in Bayelsa State?

**Table 2:**  
**Mean Ratings of Principals in Lowland and Upland Areas of Bayelsa State on Climatic Change Impact on Secondary School Educational Facilities.**

S/N	Items	Principals (n=501)						
		Lowland Principals(n=348)			Upland Principals (n=158)			
o.	The extent climatic change have impact on secondary school educational facilities.	$\bar{X}_1$	SD <sub>1</sub>	Dec <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>	Dec <sub>2</sub>	
7	Destruction of books in the library through incessant rainfall and flooding	3.59	0.55	VGE	3.54	0.58	VGE	
8	Damage of school furniture and fittings through flooding	3.62	0.62	VGE	3.29	0.52	GE	
9	Damage to school roofs by acid rain and cyclone	3.40	0.59	GE	3.39	0.60	GE	
10	Destruction of school laboratory equipment	3.29	0.66	GE	3.29	0.66	GE	
11	Damage to school buildings	3.59	0.55	VGE	3.49	0.56	GE	
12	Damage to teaching aids by flooding and cyclone	3.73	0.65	VGE	3.43	0.55	GE	
13	Destruction of sporting equipment due to extreme heat and flooding events	3.51	0.64	VGE	3.54	0.60	VGE	

Table 2 above reveals the views of principals in lowland and upland areas on climatic change impact on secondary school educational facilities in Bayelsa State. Principals in lowland areas rated items 7, 8, 11, 12 and 13 as Very Great Extent and items 9 and 10 were rated Great Extent, while principals in the upland areas on the other hand, rated items 7 and 13 as Very Great Extent and also rated items 8, 9, 10, 11, and 12 as Great Extent, showing their agreement that climatic change has great impact on secondary school educational facilities in Bayelsa State. Indicating that their responses were above 2.50.

**Research question 3:** To what extent do principals receive financial aid to ameliorate climatic change impact on educational facilities?

**Table 3:**  
**Mean Ratings of Principals in Lowland and Upland Areas of Bayelsa State on the Extent Principals Receive Financial Aid to Ameliorate Climatic Change Impact on Educational Facilities**

S/ N o.	Items	Principals (n=501)					
		Lowland Principals (n=348)			Upland Principals (n=158)		
		$\bar{X}_1$	SD <sub>1</sub>	Dec <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>	Dec <sub>2</sub>
14	School principals receive financial aids from the Government in respect of climatic change effects on school facilities.	1.37	0.48	VLE	1.38	0.58	VLE
15	Communities where schools are located assist school principals financially during climate change events.	1.51	0.60	LE	1.50	0.52	LE
16	Philanthropists assist secondary school principals with financial aids to cushion climatic change effects on school facilities.	1.37	0.54	VLE	1.35	0.49	VLE
17	Secondary school principals get financial aids from non-governmental organizations for climatic change effects on school facilities.	1.27	0.54	VLE	1.22	0.49	VLE
18	Petroleum Trust Fund (PTF) assists school principals with financial aids for damaged school facilities as a result of climatic change.	1.31	0.46	VLE	1.29	0.47	VLE
19	Secondary school principals receive financial aids from Parents Teachers (PTA) for climatic change effects on school facilities	1.23	0.42	VLE	1.26	0.55	VLE
20	Multinational oil companies assist secondary schools financially for damaged school properties as a result of climatic change events.	1.37	0.60	VLE	1.27	0.48	VLE

Table 3 above shows the response rate of principals in lowland and upland areas of Bayelsa State on the extent principals receive financial aid to ameliorate climatic change impact on educational facilities in Bayelsa State. Principals in lowland areas rated items 14, 16, 17, 18, 19, and 20 as Very Little Extent, while item 15 was rated Little Extent. Principals in the upland areas also rated 14, 16, 17, 18, 19, and 20 as Very Little Extent, item 15 was rated Little Extent. The responses of both principals in lowland and upland areas of Bayelsa State indicated that they do not receive financial aid to

ameliorate climatic change impact on educational facilities in Bayelsa State. This is because all their mean responses were below 2.50.

**Hypotheses**

**HO<sub>1</sub>** : There is no significant difference between the mean rating scores of principals in lowland and upland areas on the extent of climatic change impact on students’ learning in secondary schools.

**Table 4**  
**t-test Analysis of Lowland and Upland Principals on Climatic Change Impact on Students Learning in Secondary Schools in Bayelsa State.**

Principals	N	$\bar{X}$	SD	Df	LS	t-cal.	t-tab	Dec
Lowland	348	3.57	0.62	499	0.05	17.35	1.97	Rejected
Upland	153	3.51	0.60					

Table 4 above shows the calculated table value 17.35 at 499 degree of freedom and at 0.05 level of significance. Since the t-calculated (17.35) is greater than the t-table (1.97), the null hypothesis of no significant difference is therefore rejected. This indicates that there is significant difference in the mean ratings scores of principals in lowland and principals in upland regarding climatic change impact on students learning in secondary schools in Bayelsa state.

**HO<sub>2</sub>**: There is no significant difference between the mean rating scores of principals in lowland and upland areas on the extent of climate change impact on secondary schools’ educational facilities.

**Table 5**  
**t-test Analysis of Lowland and Upland Principals on Climatic Change Impact on Secondary Schools Educational Facilities in Bayelsa State.**

Principals	n	$\bar{X}$	SD	df	LS	t-cal.	t-tab	Dec
Lowland	348	3.57	0.62	499	0.05	32.23	1.97	Rejected
Upland	153	3.51	0.60					

Table 5 above signifies the calculated table value 32.23 at 499 degree of freedom and at 0.05 level of significance. Since the t-calculated (32.23) is greater than the t-table (1.97), the null hypothesis of no significant difference is therefore rejected. This indicates that there is significant difference in the mean rating scores of principals in lowland and principals in upland regarding climatic change impact on secondary schools educational facilities in Bayelsa state.

### Discussion

In view of research question one, the responses gathered from principals revealed that climatic change affect students' learning to a great extent. Its impact on students' learning ranges from the displacement of students' during flooding which also affects the transportation of students to school, excessive rainfalls, and spread of diseases in the classroom with the help of excessive heat rays which also affects the rate of assimilation of students' in classroom activities. This finding affirms the words of Das (2010), that the children will be the hardest hit by the increasingly frequent and severe weather events, desertification and flooding brought by climate change. Also, there is a difference in climatic change impact on students' learning in the lowland and upland areas. Students' in lowland areas were

affected more compared to their counter parts in the upland areas by killer floods and the spread of malaria as they live along the coastal areas in Bayelsa state. This is inline with Etiosa and Matthew (2007), which indicated that climate change will lead to increase aridity and desertification in northern Nigeria; it will lead to increase in flooding in the southern part especially in the coastal regions. This was the case of the 2012 flooding in Bayelsa state, as students in the lowland areas had stopped learning for weeks and already seeking shelter in the upland areas, before the upland areas were affected.

The responses of principals as regards research question two brought to bear that climatic change has great impact on educational facilities. It affects educational facilities such as the school buildings, laboratories, libraries, playgrounds, desks and chairs among others through excessive rainfalls, flooding, extreme heat, thunder storms and cyclones. This is in line with the Environmental Protection Agency (2012) in Ghana, stating that climate change will affect the education sector directly through the increased frequency and/or severity of extreme weather events resulting in damage to educational infrastructure. Other infrastructure considered essential for the functioning of the education sector, such as local transport, energy, and water may also be damaged or temporarily disrupted by extreme weather events causing disruption in the functioning of education facilities and the delivery of educational services. Further buttressing her point, EPA stated that in 2007, the Northern Region in Ghana reported of a number of collapsed school buildings due to the floods. Two hundred and ten (210) schools were affected by the flood with one hundred and ninety nine (199) classrooms reported to have collapsed.

Regarding the receipt of financial aid of secondary school principals to ameliorate climatic change impact on educational facilities, it was

revealed that no adequate financial support is given to principals to enable them cushion climatic change impact on educational facilities. Effective school administration depends largely to an extent on the financial supports administrators receive. In line with this, Onyedineke (2011) maintained that effective education depends to a large extent on how well the educational system is financed. However, principals get little supports from the communities where schools are located.

### **Conclusion**

From the findings obtained in this study, it was concluded that climatic change has negative impact on the administration of secondary schools in Bayelsa State. Its impact on students' learning ranges from; the displacement of student during flooding from their homes and schools, effects on students' health that may lead to their death, effect on their rate of assimilation in classroom and the transportation of students to school. Also it destroys the available learning facilities through cyclones, flooding extreme heat and thunder storm. The financial aid given to secondary school principals to manage affected educational facilities is on a little extent.

### **Recommendations**

Based on the findings of this study, the following recommendations were made:

1. Climatic change adaptive measures should be put in place in all schools to help prevent direct effects of climatic change on students.
2. Principals and students should be enlightened on the spread of diseases through climatic change events.
3. Climatic change events should be considered when constructing classroom blocks in school.
4. With the severity of climatic change events happening all over, state governments through various state ministries of education should set funds aside to cushion climatic change effect on schools.

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