



## Climate Change and Internal Efficiency of Secondary Schools in Kwara State.

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### **Abstract**

*This study investigated the relationship between climatic change and internal efficiency of Secondary Schools in Kwara State. The study was correction survey type. Stratified random sampling technique was used to select 1500 respondents' comprising of the principals, Vice principals, Heads of Departments, experienced teachers, Prefects and the executive members of the Parent-Teachers Association. The respondents were selected from each the three senatorial districts in Kwara State. Five hundred respondents were selected from each of the senatorial districts. Five hypotheses were generated for the climate change. Questionnaire and Internal Efficiency Checklist were used to collect the relevant data. The instruments were validated and the reliability index of .79 was obtained using tests-re test reliability method for climatic change Questionnaire (CCQ). The data collected were analyzed using person. Product moment correlation statistics and tested at 0.05 significance level. The findings revealed that climatic change lead to environmental hazards and degradation. The hazards however affected the indicators of internal efficiency such as high wastage rate drop out, teachers' turn over and low progression rate of Secondary Schools in Kwara State. It was recommended that there should be a good environmental Impact Assessment for sitting of Secondary Schools in Kwara State in the interest of improving internal efficiency. All the stakeholders in Secondary education should be made to comply with all laws, edicts and acts that are related to environmental protection in doing so, the rates of the internal efficiency of Secondary Schools in Kwara State would be enhanced.*

### Introduction

Climate can be defined as the total atmospheric condition of a place over a period of time usually between 35 and 40 years. Climate is often confused to be weather. It should be noted that weather is defined as day-to-day atmospheric condition of a place at a particular point of time. However, climate has the following elements namely Temperature, Rainfall, Relative humidity, Pressure, Cloud and Sunshine.

Balogun (1997) defined temperature as the degree of hotness and coldness of the atmosphere. When the temperature increases, the rate of chemical reaction also increases. Emielu (1996) observed that a rise of 10°C in temperature causes 2 + 0.3 times the rate of chemical reaction in the atmosphere. The increase in global temperature leads to global climatic change.

This global change increase in temperature also results from human activities such as deforestation and industrial gaseous emission such as chlorofluorocarbons (CFC), carbon monoxide, sulphur dioxide (SO<sub>2</sub>) and oxide of Nitrogen (NO<sub>x</sub>).

Nda (2009) noted that the availability of the gases in the atmosphere act as blanket over the surface of the earth, thereby preventing the ultraviolet rays of the sun from radiating back to the earth space. This therefore, keeps the earth surface warmer than it would otherwise be the result also leads to the depletion of the ozone layer.

Macken (1994) described the ozone layer as translucent screen acting like a nourishing umbrella which protects the earth from the harsh effect of solar ultraviolet radiation. This layer is part of the atmosphere with a height between 20 and 50km where the ozone (O<sub>3</sub>) gas is concentrated. Ozone-layer in the atmosphere is in dynamic equilibrium with the concentration of the molecular oxygen, water vapour, air density and the intensities of the various lines of the electromagnetic spectrum e.g. ultraviolet radiation.

Satis (1990) also observed that ozone layer is now damaged and depleted by the Pollutants introduced through various factors such as (a) human activities, (b) presence of surface generated pollutants which inject series of high reactive atoms and molecules (radicals) into the atmosphere which speed up ozone reduction processes, such radicals are: Nitrogen Oxide (NO<sub>x</sub>); chlorine (Cl) and chlorine oxide (ClO<sub>x</sub>), (c) presence of water vapour and hydroperoxyl radicals in the

atmosphere, the depletion of ozone layer however leads to climate change and global warming. The result however lead to a rise in sea level, abnormal rainfall patterns, water supply decline and a threat to the ecosystem and food shortage, it also affects life through exposure to the strong ultraviolet radiation and faster mutation causing skin cancer, other effects are deforestation great hotness if the earth, desertification of the land, excessive sunlight, and abnormal rainfall leads to erosion and flood.

According to Njoku (2009), most parts of Northern Nigeria which was mainly Sudan Savannah is increasingly becoming an arid environment at a very fast receding rate per year occasioned by fast reduction of the amount of surface water Flora, and fauna reserve on the land. Nigeria is currently losing about 35100km<sup>2</sup> of its land mass which is retracing southward at the rate of 0.6km annually hazard to human existence in Nigeria Encroachment of desertification in the North is caused by intensive heat and the blow of the North –East trade wind which brings harmatan and dryness of the physical features in the northern Nigeria.

Excessive rainfall leads to erosion forces and water pollution most families had been made homeless due to excessive flood. Much rainfall accompanies by thunderstorm had removed the roofs of many buildings, classrooms and destroyed the needed educational facilities. It should be noted that everybody wants quality education for their children and at the same time wants high security of life and property for their children.

Current global climate change in spite of global warning has led to the abnormal rainfall patterns that caused excessive floods and heavy storms in southern Nigeria with increased desertification in northern Nigeria. In its trail are such calamities as gully erosion, damage to farm and residential land that has displaced many Nigerians of their possessions and exposed them to challenges.

Emielu (2000) identified climate change as a natural cause of environmental hazards outside the control of Man. Emielu cited example of Sahelian region where the conditions are not perfectly stable. Balogun (1997), noted that the region in the 1950s witnessed abnormal precipitation pattern in the form of heavy rainfall that appeared to have stabilized but has reoccurred after, in other words, its been a different story in the last 40years (1960-2000) to the extent that

most of the region is experiencing abnormal low rainfall. Emielu however described Global warming as contributory factors to drought and desertification. This is because the higher the temperatures, the higher the evaporation and condensation and lesser the rainfall.

Robinson and Hadson (1998) noted that climate change affect erosional forces. Heavy rainfall initiates erosion if the water can not sufficiently sink into the ground due to low soil permeability. Robinson and Hadson therefore said that the climate change lead to flood. The authors however observed that high significant relationships exist between climate change and citizens health conditions. When health of an individual is affected, the Socio- economic activities of the citizens are also affected.

Internal efficiency of secondary of secondary schools in Kwara State was therefore measured through enrolment ratio, students flow rates, such as progression rates, entry rate, repetition rate, drop out rate, wastage rate and graduation rate of secondary schools in Kwara State. However, the rationale or this study was to investigate the influence of climate change on the internal efficiency of secondary schools in Kwara State.

#### **Statement of Problem**

In recent times, global climate change has affected both physical and human resources in educational system. Global climate change has led to dilapidation of school plants, destruction of farm products, shortages of food items, health hazards, emergence of wild disease transmitting insects and animals. The study investigated the influence of climate change on students' health, school plant provision and maintenance in secondary schools. The study examined the relationship that existed between climate change and level of internal efficiency indicators as wastage rate, dropout rate, teachers' turnover rate, progression rate and repetition rate.

#### **Purpose of Study**

The study aimed at investigating the impacts of climate change on internal efficiency among Secondary Schools in Kwara State. Specifically the study seeks to:

- Examine the available types of climate change in Kwara State.
- Investigate the impact of climate change on internal efficiency.

- Find out the influence of climate change on school plant provision and maintenance in Secondary Schools.
- Examine the impact of climate change on the health of students.
- To investigate the control mechanism for climate change for effective internal efficiency of Secondary Schools in Kwara State.

### **Research Hypotheses**

The following null hypotheses were generated to guide the study.

- Ho<sub>1</sub>: There is no significant relationship between climate change and internal efficiency of Secondary School students in Kwara State.
- Ho<sub>2</sub>: There is no significant relationship between climate change and level of wastage rate among Secondary Schools in Kwara State.
- Ho<sub>3</sub>: There is no significant relationship between schools' environmental degradation and drop out rate in Kwara State.
- Ho<sub>4</sub>: There is no significant relationship between climate change and teachers' turn over in Secondary Schools in Kwara State.
- Ho<sub>5</sub>: There is no significant relationship between climate change and students' progression rate of Secondary Schools in Kwara State.

### **Methodology**

This study is a descriptive survey of the correlational type that investigated the impact of climate on the internal efficiency of Secondary Schools in Kwara State. It adopted the survey research method. The study population comprised of principals, Vice-Principals and representatives of the Parent-Teachers Association. The stratified random sampling technique was adopted to select 10 Secondary Schools from each of the three senatorial districts making 30 Secondary Schools in all. A total of 1,500 respondents were used for the study.

Climate Change Questionnaire (CCQ) and internal efficiency checklist were used to collect relevant data relating to environmental degradation, enrolment ratio, wastage rate, teachers turnover and progression rate.

The content validity of the instrument was assured through comments and criticisms from experts in climatology and environmental education. Test - retest reliability method was used to determine the reliability of the instrument that gave " $r$ " = 0.79 indicating a high level of reliability. The data obtained were analysed using Pearson Product

Moment Correlation statistics to determine the level of climate change as it affects the level of internal change as it affects the level of internal efficiency of Secondary Schools in Kwara State at .05 significance level.

### Results

$H_{01}$ : There is no significant relationship between climate change and internal efficiency of secondary schools in Kwara State.

Table 1: Climate change and internal efficiency of Kwara State Secondary Schools.

Variable	No	x	Sd	df	Calculated r-value	Critical r-value	Decision
Climate	1500	66.76	12.28	Internal 1499	0.72	0.195	$H_{01}$ rejected
Efficiency	1500	14.69	7.32				

$P < 0.05$

Table 1 shows that the Calculated r-value of 0.72 is greater than the critical r-value of 0.195 at 0.05 level of significance and degree of freedom of 1499. Thus the null hypothesis which states that there is no significant relationship between climate change and internal efficiency of Secondary Schools in Kwara State is however rejected. This implies that high positive significant relationship exist between climate change and internal efficiency of Secondary Schools. The result is in line with Ogundele (2003) which observed that every parent wants security for their children as such they enroll their children in various schools where their children life is well secured.

In view of this when there is rainfall or Coldness of weather condition flooding erosion forces and bushy environment many parents discourage their children from going to school. Many parents tend to patronize schools that are free from hazards like erosion, flood, desert thick forest and excessive water togged many parents enroll their children in schools where there are no ecological problems.

This result supports the opinions of Tesfa (2006) which stated that interaction between climate change and internal efficiency could be negative or positive. The author cited the case of Northern Nigerian where the interaction with climate change brings about high dropout rate among the student in secondary schools. Drought and dryness of the region debar many parents from sending their children to schools.

The result leads to low entry and progression rate and high dropout and the repetition rate among secondary schools in Kwara State.

$H_{02}$ : There is no significant relationship between climate change and level of wastage rate among Secondary Schools in Kwara State.

**Table 2: Climate change and level of wastage rate among Secondary Schools in Kwara State**

Variable No.	X	Sd	Df	Calculated r-value	Critical Decision r-value
Climate Change 1500 $H_{02}$	66.76	12.28	1499	0.172	0.195
Accepted Wastage Rate 1500		63.52	19.22		

$P < 0.05$

Table 2 shows that the calculated r-value of 0.172 is less than the critical r-value of 0.195 at the degree of freedom of 1499 and tested at 0.05 significance level. Hence the null hypothesis which stated that there is no significant relationship between climate change and level of wastage rate is however accepted. The result indicates that there is low and positive significant relationship between climate change and level of wastage rate among Secondary Schools in Kwara State the result is in line with the opinion of Ogundele (2008) which observed that everyone wants quality education and assurance for their children.

Nigeria society however described mass illiteracy as the bane of National development. However climate change modification in Kwara State setting enables every parent to send their children to school. It means that climate change is not a predicament to children's education, especially in Kwara State.

$H_{03}$ : There is no significant relationship between schools environmental degradation and level of dropout in Secondary education of Kwara State.

**Table 3:** Schools environmental degradation and level of dropout in Kwara State.

Variable	No	x	Sd	Df	Calculated r-value	Critical Decision r-value
School Environment factor	1500	82.72	22.34	1499	0.65	0.195
Drop Out Rate	1500	62.44	16.62			

$P < 0.05$

Table 3 Shows that the calculated r-value of 0.65 is greater than the critical r-value of 0.195 at .05 level of significant and 1499 degree of freedom. Thus the null hypothesis which stated that there is no significant relationship between school environmental degradation and rates of drop out in Secondary Schools of Kwara State is however rejected.

This however means that there is high positive significant relationship between school environmental degradation and dropout one rate among the students of Secondary Schools in Kwara State. Emeliu (2006) described environmental degradation on those hazards that are found within the school environment that constitute a threat to the people (Students and Staff) in the school Community.

According to Schmidhuber (2007) environmental degradation include Pollution flood, erosional forces, Gold weather, Stormy wind, hot weather, heavy rainfall, high sun light, drought, desertification, thick forest oil spillage etc. All these factors are duly influenced by climate change.

The factors caused by the climate change however constitute a great threat to life and property in the School. It should however noted that in Kwara State Secondary Schools many parents decide to remove their children from schools that are located in an area where there is one or more problems of environmental degradation. The removal of the children therefore leads to drop out of children from such schools.

It should however be noted that school environmental degradations influence school location and level of parental patronage in secondary schools, especially in Kwara state.

$H_{04}$ : There is no significant relationship between climate change and level of teachers turn over in secondary school in Kwara State.



**Table 4:** Climate change and level of Teachers turn over in secondary schools of dropout in Kwara State.

Variable	No	$\bar{x}$	Sd	Df	Calculated r-value	Critical r-value
Climate Change	1500	66.76	12.28	1499	0.54	0.195
Teachers Turn over	1500	71.53	19.42			

Table 4 indicates that the calculated r-value of 0.54 is higher than the critical r-value of 0.195 at a degree of freedom of 1449 and tested at 0.05 significance.

Hence, the null hypothesis which stated that there is no significant relationship between the climate change and level of teachers turn over in secondary schools in Kwara State is however rejected.

However, it indicate that the level of climate change determine to a large extent the level of teachers turn over in the school.

However, the extent to which rainfall erosion forces lead to destruction of roads, level of rainfall increases the volume of water in the river and destruction of most bridges, leavy wind destroy most classroom buildings in Kwara State.

The heavy rainfall aids thick forest and busy environment there by making school maintenance culture difficult. The ecological problems resulting from climatic change discourage many teachers, to extent that many teachers either seek transfer from ecological problems areas or resign his/her appointment from the teaching profession. The result is in line with the opinion of Obioha (2009) that stated that ecological problems caused by the climate change leads to ineffectiveness and inefficiency among the working force in the society.

It should be noted therefore, that climate change is the bane of teachers' effectiveness in Kwara State.

H<sub>05</sub>: There is no significant relationship between climate change and students progression rate among secondary schools in Kwara State.

**Table 5:** Climate change and students progression rate of secondary schools Kwara State.

Variable	No	x	Sd	Df	Calculated r-value	Critical r-value	Decision
Climate	1500		66.96	12.38		Ho5	
Change	1499		0.36		0.195		rejected
Progression Rate	1500		52.42	14.63			

$P < 0.05$

Table 5 show that the calculated r – value of 0.36 is greater than the critical r-value of 0.195 at the degree of freedom of 1499 and tested at 0.05 significance level. Hence the null hypothesis which stated that there is no significant relationship between climate change and progression rate of secondary school student in Kwara state in however rejected. In other words, significant relationship exists between climate change and progression rate of the students in Kwara State.

The result affirmed the position of Udoh (1991) that climate change brings about environmental hazard such as aforestation, erosion, oil spillage and heavy rainfall. The excessiveness of this global climatic change lead to destruction of classrooms and causing high rate of epidemics such as typhoid, meningitis, measles, high fever general hotness of the body of the school children.

However, the diseases that emanated from the climate change bring about high rate of absenteeism truancy, lateness wastage rate, dropped out, repetition, and low teachers' productivity in secondary schools especially in Kwara state.

### **Discussion**

The findings of this study show that positive significant relationships exist between climatic change and the internal efficiency of secondary schools in Kwara state. Climatic change in secondary schools have adverse impact on the various indicators of internal efficiency such as entry rate, repetition rate, absenteeism rate, lateness, truancy. These findings are in line with the opinion of Nda (2010) which stated that climate change leads to environmental degradations and hazards, such as different types of pollutions, forestations, erosion forces, desertification, flooding, waste and toxic disposals. The environmental degradation is caused by excessive rainfall, high temperature, high pressure, and excessive sunlight.

The results of the climate change according to World Health Organisation (2001) caused different disease and food shortage such as high rate of minispectis, typhoid, measles, high fever, general coldness or hotness of the body.

Cholera skin and soft tissues diseases, destruction of lives and property, damages to farmlands, electrical installations and buildings. The problem however affects internal efficiency of secondary schools of the areas.

Also, Emeliu (2000) identified the fact that forest regions harbor wild animals and cause coldness of weather which affect the lives and health of the school children. The level of children attendance to school during excessive rainfall or high temperature is greatly reduced. It indicates that the internal efficiency indicators secondary schools in Kwara state are also affected.

### **Conclusion**

From the results of this study, it can be concluded that climate change is characterized by abnormal rainfall pattern and excessive high temperature, abnormal wind, and high relative humidity. The results however lead to different types of pollution, flooding and erosion forces etc. The results of these forces serve as threat to environment, life and properties; it also affects all the indicators of internal efficiency in the secondary schools.

This is because parents are so much interested in the security of their children's lives and property. In view of this, the climate change in

the state determines the level of parental patronage to schools in the state.

### **Recommendations**

Based on the findings and conclusion of the study, the following recommendations are made:

#### **Environmental awareness campaign should be intensified.**

This campaign will aid understanding of the various climate change effects and their control mechanism in secondary schools, so as to improve internal efficiency indicators in Kwara state.

#### **Good environmental impact assessment and proper secondary school location.**

Educational planners should have effective environmental impacts assessment before any school location site is approved so as to create conducive atmosphere for the members of the school community and to reduce wastage rate among secondary schools especially in Kwara state.

#### **Compliance with the environmental protection laws in Nigeria.**

All laws relating to the protections should be enforced in the school's laws such as Environmental Health Practice Regulation Acts of 2007, Federal Environmental Protection Decree No. 58 of 1988, National Environmental Protection Regulation of 1991, Environmental Impact Assessment Law of 1992, and Environmental Sanitation Law of 1985. All these should be enforced in the secondary schools in a bid of controlling the impacts of climatic change in the secondary schools in the interest of reducing dropped out rates in Kwara state.

#### **Disaster relief measures should be adopted for teachers in environmental hazards areas.**

To limit the exodus of teachers due to the impact of climate change on the school environment, disaster relief measures such as good and reliable insurance programme enactment and enforcement of appropriate legislation against environmental polluters, deforesters etc. Relief allowance funds for the teaching of secondary schools in environmental problematic areas. If effective measures are taken on the

environmental degraded area, it will reduce the high rate of teachers' turnover in the secondary schools.

#### Establishment of Ecological Relief Commission.

The federal government should establish ecological relief commission to solve the problems caused by climate change on the environment. The commission will focus on community's schools, health institutions. The commission should be adequately funded and monitored, if done it will encourage success and progression of government policies and programme in Nigerian institutions such as schools.

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