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## Impact of Climate Change (Flooding) On School Children in the Riverine Areas of Anambra State

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By

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### Abstract

*Climate change (flooding) is one of the biggest environmental challenges facing the whole world today. The study sought the impact of climate change (flooding) on the school children in the Riverine areas of Anambra state. Meaning and causes of climate change were highlighted. The population of the study were all the 12 secondary schools in Ogbaru Local Government Area. The sample consist of 10 principals and 200 teachers in Ogbaru local government area of Onitsha education zone, totaling 210 respondents. The instrument for data collection was a questionnaire titled impact of climate change on school children in the Riverine areas. (ICCSCRA) which was validated by three experts, from Educational Administration and Planning, Guidance and Counselling and Measurement and Evaluation all from*

*Educational Foundations, Faculty of Education, University of Nigeria Nsukka. A reliability coefficient of 0.89 was obtained. Mean and standard deviation was employed to analyse the four research questions. 26 items affirmed the four research questions while only two item did not agree to the question. Based on the findings, recommendations were made, which includes among others, that there is need for awareness creation in the country once the world meteorological announces the event of such global warming or flooding. Conclusion, were drawn.*

**Keywords:** Impact, climate change (flooding), school children.

Climate is defined as the ‘average weather’ in a place. It includes patterns of temperature precipitation (rain or snow) humidity, wind and seasons. Climate patterns play a fundamental role in shaping natural ecosystems and the human economies and cultures that depend on them (Ezeokafor 2013). Some short term climate variation is normal but longer-term trends indicate a changing climate. Example include shift in wind patterns, the average temperature or the amount of precipitation. These changes can affect one region, many region or the whole planet (Allison, 2010).

Climate change means the global changes that persists over a sustained period of time (Ezeokafor 2013). World meteorological organization (2012) defines climate change as includes increase in global surface temperature, ocean temperature or global warming, changes in rainfall patterns, changes in the frequency of extreme weather events, widespread melting of snow and ice (glacier) and rising global means sea level. This change in energy is then spread out around the globe to effect the climates of different regions (impact.org/climate change 2015).

The main causes of climate change according to World Meteorological Organization (W.M.O., 2012) are natural and human activities. The natural causes comes from the sun’s output while the human activities are the burning of fossil fuels (coal, oil and natural gas) clearing of land for agriculture and land-use changes like deforestation which emissions of carbon dioxide (CO<sub>2</sub>), the main gas responsible for climate change as well as others ‘greenhouse’ gases Intergovernmental Panel on Climate Change (IPCC, 2007). The Royal society article (2010) preparing for a changing climate revealed that rising levels of carbondioxide and other heat trapping gases in the atmosphere have warmed the earth and are causing wide-ranging impacts including rising sea levels, melting snow and ice, more extreme heat event, fires and drought, more extreme storms, rainfall and flood. Every day, more electric gadgets flood the market and without widespread alternative energy sources, we are highly dependent on burning coal for our personal commercial electric supply. On the other hand, the demand for more cars and consumer goods means that we are increasing the use of fossil fuels for transportation and manufacturing our consumption is outpacing our discoveries of ways to mitigate the effect’s with no end in sight to our massive consumer culture.

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Methane emission is another extremely potent greenhouse gas, ranking right behind  $\text{CO}_2$ . When organic matters is broken down by bacteria under oxygen starved conditions (anaerobic decomposition) as in rice paddies, methane is produced. The process also takes place in the intestine of herbivorous animals and with the increase in the amount of concentrated livestock production, the levels of methane released into the atmosphere is increasing. (impact.org 2015).

Increase use of chemical fertilizers on croplands causes global warming. The high rate of application of nitrogen rich fertilizers has effects on the heat storage of cropland (nitrogen oxide have 300 times more heat, trapping capacity per unit of volume than carbondioxide) and the run off excess fertilizers create “dead-zones” in our oceans. (Planet save.com, 2016). In addition to this effect, high nitrate levels in groundwater due to over fertilization are cause for concern for human health.

Moreso, scientists predict an increase sea level worldwide due to melting of two massive ice sheets in Antarctica and Greenland. However, many nations around the world will experience the effects of rising sea levels which could displace millions of people through flood (planet save.com, 2016).

More killer storms is another danger facing the earth, hurricanes and cyclones is increasing. Flooding occurs when rivers overflow their banks and submerged homes, schools, farmlands etc. Flooding could occur when the ground could no longer absorb rains. Schools are closed down because of the change in climate like excessive flooding, pollution and drought.

School children can be seen as children between the ages of 6 years-18 years that is called the early adolescents who are still in school and are part of the curricular processes which brings about learning. Secondary school is a social institution which brings together, behaviour and intelligence. Its objectives are clearly defined in the National Policy on Education (2014). The broad goals of secondary Education shall be to prepart the individual for (a) useful living within the society and (b) for higher education.

### **The Impact of Climate Change (Flooding) on Schools**

In as much as climate change is a global factor, Anambra state has experienced and is still experiencing intense devastation on all sectors of the economy due to climate change. Education/schools are the worst hit Obaze (2015) asserted that Anambra state has experience a hitherto unknown flood disaster in 2012 resulting from a combination of unprecedented seasonal rains and the systematic opening of several upstream dams. He also observed that the states in the river basin and low lying areas were the most adversely affected and sadly, Anambra state has been deemed to be the most acutely affected.

The impact of climate change on schools cannot be over emphasized because what affects the nation also affect school children invariably (ARS 2010). Children of school age are more vulnerable to the unsteady and cruel weather changes in the state.

It pose a serious risk to their health and safety. According to UNICEF (2008) excessive heat prevent students from attending school, common sandstorms like those seen in the Gulf Co-operation council countries, where brought parched grounds are unable to absorb rains, flash floods, erosion or landslide can make roads impassable, preventing students from reaching schools. This weather conditions are often hard and respuive on school children as most of them do not know how to protect themselves from the effect of these weather which often leads to loss of lives or injuries. Disruptions to electricity, a potential side effect, can force schools to suspend activity or where severe wheather damage school infrastructure. Such interruptions in attendance to school can only have detrimental consequences for learning outcomes. Thus, such effects are likely to disproportionately affect school children, their well-being and care and their ability to participate in good quality, equitable education. Furthermore, disruption to existing agricultural practices, will lead to more widespread malnutrition because of higher food prices. Children of school age are exposed to respiratory diseases such as asthma, pneumonia, severe cold, lungs diseases and dry skin as a result of climate change. Create, (2008) observed that school-aged children who suffer from protein-energy malnutrition hunger or who lack certain micro-nutrients in their diet (particularly iron, iodine, or vitamin A) or who carry a burden of diseases such as malaria, diarrhea or worms do not have the same potential for learning as healthy and well nourished children and that they are more likely to repeat grades or class, drop out early and fail to learn adequately due to poor attention, low motivation and poor cognitive function.

School flooding during the rainy seasons calls for relocation of students to a temporary camp or settlement. Adjustment is always a problem, such students usually loose concentration and interest because of challenges of emotional imbalance and instability as they are faced with the stress of meeting new people, new teachers, and new environment whenever they are relocated. In most cases, their relocated areas have no facilities for them thereby exposing them to seat on bare floor, without chairs, desk and chalkboard.

Consequently, the researchers intend to examine the impact of climate change (flooding) on school children and the adaption strategy toward climate change in the towns along the shores of the River Niger.

### **Research Questions**

The following research questions guided the study.

- 1) What are the impact of climate change (flooding) on the schools?
- 2) What are the impact of climate change (flooding) on the school children?
- 3) What are the school adaption strategy for the climate change (flooding).
- 4) What are the school/community adaption strategies for climate change (flooding)?

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**Methodology**

Research design was a descriptive survey design. The areas of the study was the schools in the Riverian areas of Anambra state. The population of the study comprised all the teachers and principals of Ogbaru local government areas of Anambra state. Ogbaru has 12 secondary schools in Onitsha Education zone. Schools in Ogbaru local government were used for the sample because they were living at the shore of the River Niger.

The population of the study were all the principals and teachers in Ogbaru local government of Onitsha education zone, numbering 10 principals and 200 teachers. The instrument for data collection was a self developed instrument from the literature title: Impact of Climate Change on School Children in Riverine Areas of Scale (ICCSRS) was used to obtain relevant data for this study. It comprised two sections, section A and B. Section A dealt on the demographic information while section B sought the questionnaire proper and it consisted of 26 items divided into four clusters according to the four research questions. The first cluster focused on the impact of climate change (flooding) on the school. The second cluster handled the impact of climate change (flooding) on the school children; the third cluster articulates the school adaption strategy for climate change (flooding) and finally the fourth cluster handles the school/Community adaption strategy for climate change (flooding). The responses were expected to agree or disagree.

The instrument were face validated by three experts, each from Educational Administration and Planning, Guidance and Counselling and Measurement and Evaluation all from the Department of Educational Foundations of the Faculty of Education, University of Nigeria Nsukka. A pilot study was carried out in a school in Ayamelum local government area of Anambra state and it yielded a reliability coefficient of .89. The instrument were administered on 10 principals and 200 teachers in Ogbaru Local Government Area of Onitsha Education zone using two instructed assistance. The data collected were analyzed using mean and standard deviation. The accepted criterion was a mean of 2.50 and above.

**Results**

**Table 1: Research question 1:** What are the impact of climate change (flooding) on the schools

S/N	Items	$\bar{X}$	SD	Decision
1	School compound is flooded	3.56	.680	A
2	Ground were unable to absorb rains	3.42	.798	A
3	Erosion or landslide makes roads impassable	3.33	.878	A
4	Electric poles fall	3.21	.837	A
5	Damage of school infrastructure	3.48	.714	A
D	Severe weather conditions like cold, harmattan	2.15	1.05	

Table 1, shows that all the respondents are of the opinion that five items out of the six are the impact of climate change (flooding) on the schools. Item six, which is severe weather conditions like cold, harmattan has no impact on the school. The above shows that the standard deviation scores were very high. It ranges from .68 to .87 though item 6 has a low standard deviation of 1.05. That not withstanding, the items proved that they were impact of climate change (flooding) on the schools.

**Table 2: Research Question 2:** What are the impact of climate change (flooding) on school children

S/N	Items	$\bar{X}$	SD	Decision
1	Brings about diseases such as malaria, diarrhea, asthma, pneumonia, worms, lungs diseases etc.	2.80	.994	A
2	Malnutrition	2.36	1.20	D
3	Scheme of work will not be concluded	3.34	.792	A
4	Some may repeat classes.	3.01	.922	A
5	Some may drop-out from school	3.54	.624	A
6	It brings about poor cognitive function.	2.74	.986	A
7	Possible risk of drowing or injury	3.45	.615	A

From table 2 above, one could observe that out of the seven items only six agreed that the items are impact of climate change (flooding) on the school children. Item 2 which is malnutrition had a low mean score which means that the respondents do not agree that it was part of the impact of climate change (flooding) on the school children. This indicates that the standard deviation scores were high i.e .99, .79, .92, .62, .98 and .61. Though, the second item malnutrition has 1.20 as standard deviation.

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This shows that malnutrition is not an impact of climate change (flooding) on the school children.

**Table 3: Research Question 3:** What are the school adaption strategy for climate change (flooding)

S/N	Items	$\bar{X}$	SD	Decision
1	Schools to build protected flood pond or collector in the school	3.56	.678	A
2	Review the existing infrastructure to ensure safety.	3.02	.961	A
3	Design suitable infrastructure that could withstand severe weather events.	3.60	.535	A
4	Incorporate climate change as a relevant subject in the school.	2.70	1.03	A
5	Schools to ensure that canals and drainages around the school are not blocked.	3.42	.701	A

Table 3; indicated that all the items are the school adaption strategy against (flooding) climate change. Cluster 3 had mean scores that was above the agreement level from 2.70 to 3.60. The standard deviation were also high which indicates that all the items are the school adaptation strategy for climate change (flooding).

**Table 4: Research Question 4:** What are the school/Community adaption strategy for climate change (flooding)

S/N	Items	$\bar{X}$	SD	Decision
1	School/community should distribute fliers and handbills to educate people against flooding.	3.26	.759	A
2	They should create awareness for better understanding of flooding.	2.85	.830	A
3	They should ensure that nobody builds along water channels.	3.07	.792	A
4	They should clear waste and gardage from water ways.	3.14	.875	A
5	They should unblock drainages.	3.05	.961	A
6	Create outlets for flood and stagnant water.	3.56	.568	A
7	Clean their environment regularly.	3.42	.710	A
8	Check people burning in discriminately.	3.08	.972	A

Table 4 showed that all the eight items were accepted by the respondents as school/Community adaption strategy for climate change (flooding). All the items had mean score of 2.85 and above which shows they all agreed that the items in cluster 4 are adaption strategy for the school/Community against flooding. The standard deviation were also high.

## **Discussion**

The world has been experiencing menace of climate change (flooding) over a decade now. As such flooding as part of the climate change has been experienced in this part of the country Nigeria as devastating as ever.

The discussion were presented according to the four research questions. Research question 1 revealed the impact of climate change (flooding) on the schools, the six items in that cluster shows that school compound were flooded probably because the ground were unable to absorb rains, erosion and land slide may occur and makes the roads in passable, electric poles may fall, there may be damage of the school infrastructure. All the respondents affirmed that these were possible impact of climate change on the school. Item 6 of table one did not agree that severe conditions like cold, harmattan can have impact to the school. Ezeokafor (2013) observed that the consequences of climate change (flooding) damage property and infrastructure especially in schools. This affirms what this study found out.

Research question 2; which is the impact of climate change (flooding) on school children. The respondents agreed that climate change (flooding) brings about diseases like malaria, diarrhea, ashma, pneumonia, worms, lungs diseases etc. scheme of work may not be completed because flooding will not allow them to be in school thought of studying. Some may repeat classes or drop out from school. It bring about poor cognitive function and have possible risk of drowning or injuring the school children. Create (2008) who observed that school-aged children who carry a burden of diseases may not have the same potential for learning as healthy and well-nourished children and that they are more likely to repeat grades, dropout early etc. Creates finding is a line with what this study found out. On the other hand, the respondents do not agree that malnutrition is an impact of climate change (flooding) on school children.

Research question 3: The school adaption strategy for climate change (flooding). The respondents agreed that all the five items in cluster 3 are all adaption strategy, like, schools to build protected flood pond or swamp or collector in the school, review the existing infrastructure to ensure safety, design suitable infrastructure that could withstand severe weather events, incorporate climate change as a relevant subject in the school so that the students will be aware of flooding and what to do in case of such. Schools to ensure that canal and drainages around the school are not blocked. There is need for awareness creation on climate change (flooding).

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Research question 4 indicates the school/Community adaption strategy for climate change (flooding). All the eight items of cluster 4 were accepted by the respondents as school/Community adaption strategy thus, school/Community should distribute flyers and hand bills to educate people against flooding, they should create awareness for better understanding of flooding, they should ensure that nobody builds along water channels, and should clean waste and garbage's from water ways, unblock drainages, create outlets for flood and stagnant water, clean their environment regularly, check people burning indiscriminately. Ezeokafor (2013) is in agreement with school/community adaptation strategy of this study thus, he opined that towns should clear their drainages and keep their environments clean.

#### **Conclusion**

The world over has been experiencing climate change (flooding), it is not new, though, it is new in Anambra state when the whole towns near the shores of River Niger were submerged in 2012. Climate change is the single biggest environmental issue facing the world today. Care must be taken that such flooding will not happen again by closing all areas that could lead to such flooding e.g opening of dams in Cameroon that devastated Nigerians and destroyed lives and property worth over 150 billion naira. Water ways should not be blocked to avoid flooding in norms, houses and schools, drainages should be cleared for easy flood passage. People should also keep their environment clean and dispose disposable in the proper places to avoid blocking the drainages.

#### **Recommendations**

Based on the findings, the following recommendations were proffered.

1. Climate change has been the worlds problem as such no single Community or School can handle the adaption strategy all alone.
2. Government should endeavour to approve building houses, factories, industries etc out of the water ways. To avoid blocking the water ways and flood may divert to people homes or schools.
3. There is need for awareness creation in the community once the World Meteorological announces the event of such global warming or flooding.
4. Climate change is a weather/nature condition and not totally human making as such, all hands must be on deck to sought adaption strategy that will help the world survive the climate change events.
5. The Federal government of Nigeria should come to terms with their neighbouring countries so to avoid future flooding.

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