

## **The environmental effects of flood disaster in Anambra state**

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### **ABSTRACT**

*Flood is an overflow of water that submerges or "drowns" land. In developing countries it occurs as a result of blocking of natural and manmade drainages and poor maintenance of water dams/ reservoirs which seldom give way after persistent heavy down pours. In coastal lowlands and swamp lands, flooding is aided mainly by blocked channels and indiscriminate sand fling of coastal swamp areas and natural drainage channel for urban development/constructions. In this paper, the causes of flood and possible scientific, technological, political, economic and social impacts of flood disaster on the environment a case study of Anambra state have been studied. Often times flooding is caused by climate change, especially in the developed economy where scientific mitigating options are highly employed. Researchers have identified Green Houses Gases (GHG) as the cause of global climate change. The recent flood disaster in Anambra State which caused physical damage to structures, social dislocation, contamination of clean drinking water, spread of water-borne diseases, shortage of crops and food supplies, death of non tolerant tree species, disruption in transportation system, serious economic loss and psychological trauma is a function of climate change. There is need to encourage generation of renewable energy sources, use of less carbon intensive fuels and other energy efficient sources. Carbon capture/ sequestration, proper management of our drainage systems and good maintenance of our dams are good option towards saving the environment.*

**Key words:** Anambra State, Flood disaster, Climate change, Green House Gases and Carbon capture.

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### **INTRODUCTION**

Nigeria, a country in the western part of Africa has 36 states plus Abuja, the capital territory. Anambra State is a state in the south-eastern part of Nigeria. The indigenous ethnic group in Anambra state is the Igbo (98% of population) and a small population of Igala (2% of the population) who live in the North western part of the state. Anambra is the eight most populated states in the Federal Republic of Nigeria and the second most densely populated state in Nigeria after Lagos State. The stretch of more than 45 km between Oba and Amorka contains a cluster of numerous thickly populated villages and small towns giving the area an estimated density of 1,500–2,000 persons living within every square kilometer of the area [1]. Anambra is rich in natural gas, crude oil, bauxite, ceramics and has 100 percent arable soil. It is the first state in Nigeria that has private refinery, Orient Petroleum Refinery (OPR) at Nsugbe-Umuleri area [1]. There are 21 local governments' areas in the state;

- Aguata
- Awka North
- Awka South
- Anambra East
- Anambra West
- Anaocha
- Ayamelum
- Dunukofia
- Ekwusigo
- Idemili North

- Idemili South
- Ihiala
- Njikoka
- Nnewi North
- Nnewi South
- Ogbaru



Figure 1.1: Anambra State LGA Map.

Flood is an overflow of water that submerges or "drowns" land [2]. The European Union (EU) Floods Directive defines a flood as a covering by water of land not normally covered by water. In the sense of "flowing water", the word may also be applied to the inflow of the tide. Flooding may result from the volume of water within a body of water, such as a river or lake, which overflows or breaks levees, with the result that some of the water escapes its usual boundaries or may be due to accumulation of rainwater on saturated ground in an area flood [3]. While the size of a lake or other body of water will vary with seasonal changes in precipitation and snow melt, it is not a significant flood unless such escapes of water endanger land areas used by man like a village, city or other inhabited area.

Floods can also occur in rivers, when flow exceeds the capacity of the river channel, particularly at bends or meanders. Floods often cause damage to homes and businesses if they are placed in natural flood plains of rivers. While flood damage can be virtually eliminated by moving away from rivers and other bodies of water, since time out of mind, people have lived and worked by the water to seek sustenance and capitalize on the gains of cheap and easy travel and commerce by being near water. That humans continue to inhabit areas threatened by flood damage is evidence that the perceived value of living near the water exceeds the cost of repeated periodic flooding. Some floods develop slowly, while others such as flash floods can develop in just a few minutes and without visible signs of rain. Additionally, floods can be local, impacting a neighbourhood or community, or very large, affecting entire river basins.

### 1.1 Types of flood.

There are many types of flood. The principal types of flood are Areal, Riverine, Estuarine, Coastal, Catastrophic and human induced flood.

#### 1.2a Areal

Areal flood occurs in any of the following forms:

- Floods often happen over flat or low-lying areas when the ground is saturated and water either cannot run off, or cannot run off quickly enough to stop accumulating.
- Floods can occur if water accumulates across an impermeable surface (e.g. from rainfall) and cannot rapidly dissipate (i.e. gentle orientation or low evaporation).
- A series of storms moving over the same area can cause areal flash flooding.
- A muddy flood is produced by an accumulation of runoff generated on cropland. Sediments are then detached by runoff and carried as suspended matter or bed load. Muddy runoff is more likely detected when it reaches inhabited areas. Muddy floods are therefore a hill slope process, and confusion with mudflows produced by mass movements should be avoided.

### 1.2b Riverine

This occurs in any of the following forms:

- (i) **Slow kinds:** Runoff from sustained rainfall or rapid snow melt exceeding the capacity of a river's channel. Causes include heavy rains from monsoons, hurricanes and tropical depressions, foreign winds and warm rain affecting snow pack. Unexpected drainage obstructions such as landslides, ice, or debris can cause slow flooding upstream of the obstruction.
- (ii) **Fast kinds:** include river flash floods resulting from convective precipitation (intense thunderstorms) or sudden release from an upstream impoundment created behind a dam, landslide, or glacier.
- (iii) Dam-building beavers occurs when there is flooding in low-lying urban and rural areas, often causing significant damage.

### 1.2c Estuarine

This is commonly caused by a combination of sea tidal surges caused by storm-force winds and high river stages due to heavy rain.

### 1.2d Coastal

Coastal is caused by severe sea storms, or as a result of another hazard (e.g. tsunami or hurricane). A storm surge, from either a tropical cyclone or an extratropical cyclone, falls within this category.

### 1.2e Catastrophic

This is caused by a significant and unexpected event e.g. dam breakage, or as a result of another hazard (e.g. earthquake or volcanic eruption).

### 1.2f Human-induced

Human-induced is as a result of accidental damage by workmen to tunnels or pipes.

## 1.3 Effects of flooding

The effects of flooding ranged from primary, secondary to tertiary effects. Primary effects occur when there is physical damage example damage to structures as was the case of Anambra state in the last flood disaster. The secondary effects are called into play when there is contamination of clean drinking water, spread of water-borne diseases, shortage of crops and food supplies, death of non tolerant tree species and disruption in transportation system. Tertiary and long-term effects occur when there is serious economic loss and psychological trauma.

## 2.1 Flood in Anambra State

In developing countries like Nigeria, flooding occurs as a result of blocking of natural and manmade drainages and poor maintenance of water dams/ reservoirs which seldom give way after persistent heavy down pours. In coastal lowlands and swamp lands, flooding is aided mainly by blocked channels and indiscriminate sand fling of coastal swamp areas and natural drainage channel for urban development/constructions.

The recent flooding in Nigeria that affected the 36 States of Nigeria including the federal capital territory (Abuja) could not only be attributed to the blocking of natural and manmade drainages but partly to climate change. Although a number of sources said that it was as a result of water released from Cameroun dam. The National Emergency Management Agency (NEMA) and Minister for Environment, Hadiza Ibrahim said that Anambra State was situated at the lowest point of the River Niger and as such is flood prone. This was the reason why Anambra State was greatly and badly affected by flood [4]. The affected local government areas were Anambra West, Anyamelum, Anambra East and Ogbaru. These local governments were highly submerged in water. The governor of Anambra State, Mr Peter Obi in the same sun news said that Awka North, Ihiala, Onitsha North and South suffered various degrees of destruction [5]. The houses of former Minister for Aviations, Princess Stella Oduah, Former Deputy Governor of Anambra State, Prince John Emeka, Speaker of the house of Assembly, Princess Chinwe Nwebili and Secretary to the state government, Mr Oselloka Obaze were submerged by flood [4]

The number of Internally Displaced Persons (IDPs) ran into thousands with an estimated 10,000 homes fully or partially submerged [6]. Leading industries in the south of Onitsha Metropolis were submerged and did not work in those periods. The situation for these communities remained dire and very bleak. Homes, farmlands and properties estimated at billions of naira were lost; there were minimal loss of lives, with only few casualties, thanks to the early warning and proactive intervention of the Anambra State Government and SEMA. Anambra State was tagged flood disaster zone.

The Anambra State Government came to the needs of the affected communities and IDPs through the interventions of State-based Army and Navy formations, the police, churches, NGOs and the State Emergency Management

Agency (SEMA). SEMA, and its federal counterpart, NEMA, as well as UNICEF conducted needs assessment missions. Consequently, relief materials were delivered by the state government, NEMA and other donors. The state government in collaboration with the Nigerian Army and Navy continued in their evacuation, search and rescue (SAR) missions for stranded persons. Those evacuated were hosted in fifteen (15) IDP camps, namely, Sharon House, Bishop Crowder School, the Army Barracks, New Bethel Primary School, and Onitsha-South LGA premises in Onitsha; Health Centre Umueje, Community Primary School Igbakwu, the Skills Acquisition Centre Anaku, in Ayamelum LGA; St. Augustine Catholic Church and Unity Primary School Umuoba Anam; General Hospital Umuleri, and St Joseph Secondary School, Aguleri, all in Otuocha and Schools in Ossomala, Atani and St. Gregory Church Odekpe in the Ogbaru LGA. The IDPs were accommodated, provided with medical care and fed by the Anambra State Government and its local collaborators [7].

The primary, secondary and tertiary effects of flood were called into play in the last flood disaster in Anambra State. There were physical damages to structures, social dislocation, contamination of clean drinking water, spread of water-borne diseases, shortage of crops and food supplies, death of non tolerant tree species, disruption in transportation system, serious economic loss and psychological trauma. Huge sum of money meant for other purposes were spent to cushion the effect of the natural disaster. Palliative and long lasting measures were jointly provided by charitable organizations, good hearted individuals, state and federal governments through SEMA and NEMA respectively. The National Emergency Management Agency (NEMA) has attributed climate change to the worst flood disaster witnessed in the country this year [8]. The Director General of NEMA, Muhammad Sani-Sidi disclosed this at the end of the 18th Session of the Conference of the Parties (COP 18) to the United Nations Framework Convention on Climate Change (UNFCCC) in Doha, Qatar. Speaking at the event, Sani-Sidi said that the climatic condition and drastic change to whether pattern contributed to massive flooding witnessed in the most states in Nigeria where lives were lost and sources of livelihood worth billions of Naira were destroyed. The DG's comments were contained in a statement by NEMA spokesman, Sani-Sidi said, "We are now living witnesses to the reality of climate change and global warming where areas considered as dry land in the Northern part of the country witnessed excessive and torrential rainfall while some communities in the South were also submerged.

On what should be done to mitigate the impact of flooding in the country, Sani-Sidi said, "We must be environmentally conscious, where we need to build buffer dams, we must build; and people in flood plains should move to higher grounds. "State governments must be serious about emergency management and local government authorities must also be serious; we need to create awareness and build capacity so that we can reduce our people's vulnerability." On NEMA's participation at COP 18, the director-general said that, as disaster managers, the agency finds the conference relevant, especially with the country's recent experience of natural disasters attributed to climate change [4]. The growing competition for water and declining fresh water resources, the utilization of marginal quality water has posed a new challenge for environmental management [9].

### **Causes of flooding in Anambra State**

The following are the causes of flooding in Anambra State;

- (i) Improper city planning with regard to layout of building and other structures
- (ii) Poor drainage system
- (iii) Over population
- (iv) Government irresponsibility
- (v) Climate change

### **2.2 Pictures of Areas Affected by Flood in Anambra State**

Heavy flooding has completely submerged several communities in Anambra State-worst hit are: Ogbaru, Ayamelum, Anam and other areas of the lower Niger River and are shown on plates 1.1-1.4.

### **2.3 Flood benefits**

However, floods (in particular the more frequent/smaller floods) can also bring many benefits, such as recharging ground water, making soil more fertile and providing nutrients in where it is deficient. Flood waters provide much needed water resources in particular in arid and semi-arid regions where precipitation events can be very unevenly distributed throughout the year. Freshwater floods particularly play an important role in maintaining ecosystems in river corridors and are a key factor in maintaining floodplain biodiversity. Flooding adds a lot of nutrients to lakes and rivers which leads to improved fisheries for a few years, also because of the suitability of a floodplain for spawning (little predation and a lot of nutrients). Fishes make use of floods to reach new habitats. Birds profit from the boost in production caused by flooding but in Anambra one could hardly envisage any of these gains in the last flood disaster.



**Plate 1.1: Picture of buildings and areas submerged by flood [10].**



**Plate 1.2: Picture of area with total submergence by flood [10].**



Plate 1.3: Picture of People been rescued using Canoe [10].



Picture 1.4: Picture of People Caged in their buildings by flood [10].

### CONCLUSION

This paper shows the level of damage spelt on Anambra State by the recent flood disaster. There were physical damage to structures, social dislocation, contamination of clean drinking water, spread of water-borne diseases, shortage of crops and food supplies, death of non tolerant tree species, disruption in transportation system, serious economic loss and psychological trauma. Huge sum of money meant for other purposes were spent to cushion the effect of the natural disaster. Palliative measures were jointly provided by charitable organizations, good hearted individuals, state and federal governments through SEMA and NEMA respectively. There is urgent need for government and well meaning individuals/ stake holders to make collaborative efforts through integrated flood management approach to provide long lasting measures to this disaster so that it would not occur again in the nearest future. Structural and non structural measures should be adopted through the provision of dams, water channels, levees, high flow diversions, land use and zoning plan, proper town planning, flood forecasting, flood insurance, financing, awareness drive and government support.

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