

# **The Devastating Effect of Flooding in Nigeria**

**Angela Kesiena ETUONOVBE, Nigeria**

**Key Words:** Floods, Devastating, Mitigating, Flood plain

## **SUMMARY**

Floods are among the most devastating natural disasters in the world, claiming more lives and causing more property damage than any other natural phenomena. In Nigeria, though not leading in terms of claiming lives, flood affects and displaces more people than any other disaster; it also causes more damage to properties. At least 20 per cent of the population is at risk from one form of flooding or another.

In Nigeria, flood disaster has been perilous to people, communities and institutions. Recently, Usman Danfodio University, Sokoto, and other parts of the country have been affected by flooding chasing the inhabitants away and so many places. It has shattered both the built-environment and undeveloped plan. It has claimed many lives, and millions of properties got lost due to its occurrences. One prominent feature about it is that flooding does not discriminate, but marginalizes whosoever refuses to prepare for its occurrence.

Whereas flooding itself is a situation that results when land that is usually dry is covered with water of a river overflowing or heavy rain, flooding occurs naturally on the flood plains which are prone to disaster. It occurs when water in the river overflows its banks, or sometimes results from a constructed dam. It happens without warning but with a surprise package that always delivers to unprepared community like the ones in Sokoto, Kaduna, Kebbi, Ogun, Lagos, just to mention a few.

It has not only left several people homeless, destroyed properties and disrupted business activities, the floods ravaging communities bordering Ogun and Lagos States are also threatening to expose residents to an impending cholera, diarrhea, malaria, skin infections and other water-borne diseases epidemic.

The catastrophe, which has also been witnessed in other part of the country, has been attributed to the release of the water in Oyan Dam and by some, to climate change.

It has resulted in the destruction of bridges, roads, houses, infrastructures and farmlands especially in some Northern and Western States of the Country.

This paper intends to look at the issues of flooding and suggest ways to prevent and mitigate flood disaster in a sustainable way.

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## **1. INTRODUCTION**

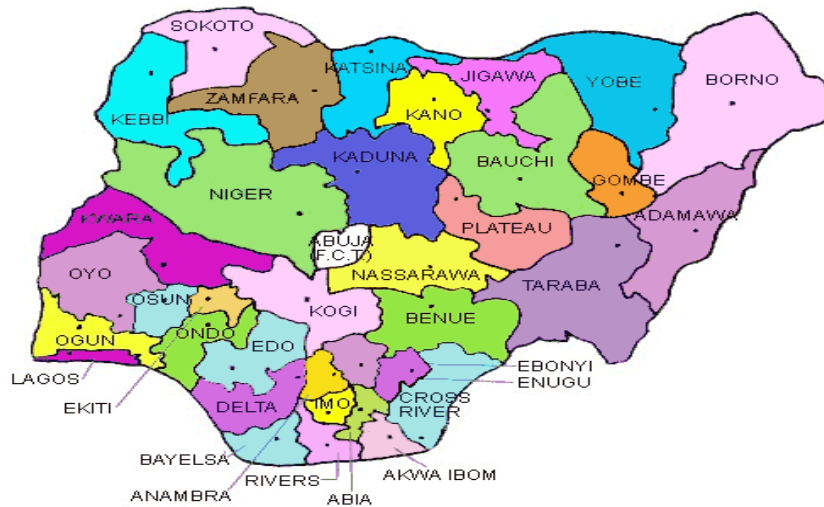
Flood is an overflowing or irruption of a great body of water over land not usually submerged (Oxford English Dictionary). It is an extreme weather event naturally caused by rising global temperature which results in heavy downpour, thermal expansion of the ocean and glacier melt, which in turn result in rise in sea level, thereby causing salt water to inundate coastal lands. Flooding is the most common of all environmental hazards and it regularly claims over 20,000 lives per year and adversely affects around 75 million people world-wide (Smith, 1996).

Across the globe, floods have posed tremendous danger to people's lives and properties. Floods cause about one third of all deaths, one third of all injuries and one third of all damage from natural disasters (Askew, 1999).

In Nigeria, the pattern is similar with the rest of world. Flooding in various parts of Nigeria have forced millions of people from their homes, destroyed businesses, polluted water resources and increased the risk of diseases (Baiye, 1988; Akinyemi, 1990; Nwaubani, 1991; Edward-Adebiyi, 1997).

## **2. THE STUDY AREA (NIGERIA)**

Nigeria is located between latitude 4° N to 14° N; and longitude 3° E to 15° E. It has a land extent of about 923,769 km<sup>2</sup>; a north-south length of about 1,450-km and a west-east breadth of about 800 km. It is a country with diverse biophysical characteristics ethnic nationalities, agro-ecological zones and socio-economy. The country has 36 states with 774 LGAs.



**Figure 1. Map of Nigeria Showing the 36 States including The Federal Capital Territory**

Nigeria's climate is characterized by strong latitudinal zones which become progressively drier as one moves northwards from the coast. Rainfall is the key climatic variable and there is a marked difference between wet and dry seasons in most areas. The annual rainfall total decreases from over 3,800 mm at Forcados on the coast to under 650 mm at Maiduguri in the extreme north-east of the country. The length of the rainy season also shows decrease from nearly 12 months in the south to less than 5 months in the north. Nigeria has a climate, which is characterized, by relatively high temperatures throughout the year. The average annual maximum varies from 35 ° C in the north to 31 ° C in the south, the average annual minimum from 23 ° C in the south to 18 ° C in the north. On the Jos plateau and the eastern highlands, altitude makes for relatively lower temperatures, with the maximum no more than 28 ° C and the minimum sometimes as low as 14 ° C. The effect of these high temperatures is high evapo-transpiration and this eventually brings about water shortage for arable cropping.

Nigeria is the most populous country in Africa. At the census of November 1991, Nigeria had 88,514,501 inhabitants and a population density of 95.8 inhabitants per sq. km. The average annual growth rate between 1963 and 1991 is 1.7%. According to 2006 census figure, Nigeria has the population of 140 million people. The major hazards being experienced in Nigeria includes land degradation, flooding, erosion, deforestation, desertification and climatic drought. Flooding in Nigeria has been due to natural and artificial factors. Flooding has been experienced in the Niger through Benue basin and Sokoto-basin in the flooding years of 1987, 1991 and 1994 and this affected agricultural land use to a great extent. On the other hand the ocean inflow in Victoria Island and that of Ibadan urban areas by Ogunpa stream have affected urban areas.

### 3. CAUSES OF FLOODING IN NIGERIA

Generally, causes of flood in Nigeria could be as a result of Natural Cause or Human Cause.

Natural Cause in form of

Heavy or torrential rains / rainstorm

Oceans storms and tidal waves usually along the coast.

Or Human Causes.

Burst water main pipes

Dam burst levee failures

Dam spills.

Flooding occurs throughout Nigeria in following forms:

Coastal flooding

River flooding

Flash floods

Urban flooding

Dam burst levee failures

Dam spills.

Coastal flooding occurs in the low-lying belt of mangrove and fresh water swamps along the coast.

River flooding occurs in the flood plains of the larger rivers

Flash floods are associated with rivers in the inland areas where sudden heavy rains can change them into destructive torrents within a short period.

Urban flooding occur in towns located on flat or low lying terrain especially where little or no provision has been made for surface drainage, or where existing drainage has been blocked with municipal waste, refuse and eroded soil sediments. Extensive urban flooding is a phenomenon of every rainy session in Lagos, Maiduguri, Aba, Warri, Benin and Ibadan.

Virtually every Nigerian is vulnerable to disasters, natural or man-made. Every rainy season, wind gusts arising from tropical storms claim lives and property worth million of Naira across the country. Flash floods from torrential rains wash away thousands of hectares of farmland. Dam bursts are common following such flood. In August 1988 for instance, 142 people died, 18,000 houses were destroyed and 14,000 farms were swept away when the Bagauda Dam collapsed following a flash flood. Urban flooding such as

the Ogunpa disaster which claimed over 200 lives and damaged property worth millions of Naira in Ibadan, are common occurrence

Floods paralyze economic activities in many towns and cities in the country. Major roads, some linking States are flooded causing hardship to motorists. When these roads were constructed, the flooding problems were not there, and the companies that constructed the roads probably did not anticipate the problem.

#### **4. AREAS AFFECTED BY FLOODS**

##### **4.1 Northern Nigeria**

In the Northern State of Sokoto, Nigeria in September, 2010, Flooding in a place called Kagara which is a small village near Goronyo town, worsened significantly. Basically the inhabitants of the village had had their village and all their homes and all their crops and all their storage of food completely destroyed. The reason that Kagara had been flooded, we believe, is because people had opened the gates on the dam to release the pressure so that the dam didn't fail, but the spillway from the dam had completely failed and so the consequences of that was Kagara getting flooded. The water came very rapidly, demolishing houses, demolishing the buildings that people use to store their food, and destroying the crops. Tens of thousands of people have been displaced, roads, trees, buildings etc were submerged,



Trees submerged in aftermath of flood in Sokoto

The flood led to the loss of thousands of houses and farmlands in 11 local government areas of the State. Other areas affected by the disaster include Isa, Kebbe, Sokoto-North, Sokoto-South, Rabah, Binji, Goronyo, Silame, Shagari, Binji and Kware local government councils. Unconfirmed reports put the death toll at 49 while about 50 villages were submerged and more than 130,000 people displaced.

While Sokoto residents were still bemoaning their fate, the fury of flooding was spreading swiftly across other parts of the country.

## 4.2 South West/ South South Nigeria

### 4.2.1 Lagos

For residents of Lagos and most Nigerian towns and villages, the rainy season is undoubtedly not the best time of the year.

This period comes with the perennial problems of flooding which leaves many homes swamped with the resultant loss of property and sometimes human lives. Property estimated at several millions of Naira destroyed in many communities in the Ikorodu axis



Lagos Floods, Ajegunle –Ikorodu Express Road at Ajegule



Ajegunle-Ikorodu flood in Lagos.

It was gathered that the persistent overflow of River Ogun caused the disaster in the State. Also, that the exceptional rainfall being witnessed globally this year had made the Atlantic Ocean level to rise, adding that this in turn forced Lagos Lagoon Water to rise and spread into the flood prone areas of River Ogun.

#### 4.2.2 Kogi

In what seems like wildfire, Kogi state became the next casualty. About 90 communities particularly, in Lokoja, Ibaji and Kogi local government areas of the state were sacked by the raging flood which displaced over 500,000 people. In some areas, only farmlands were affected while in others, both homes and farmlands were all swept away.

The people of Kogi local government were the worst hit as 46 communities were affected. Some of the areas are: Akpaku, Edeha, Edegaki, Odama, Okasemia, Adamogu, Ogbangede, Onumaye, Kelebe, Okpozogi, Edimose, Onwari, Irenedu, Kpakpazi and Panda among others.



Flood in Panda, Kogi State

#### 4.2.3 Kwara

Over 15 communities and farm plantations worth millions of naira have been submerged by flood in shonga district, Edu Local Government Area of Kwara State. The disaster was not unconnected with release of water from Kainji Dam which subsequently flooded all banks along River Niger areas

The flood also took over 500 hectare farms of cassava, rice, guinea corn and maize crops as well as livestock which include sheep, goats and Cattle.

#### 4.2.4 Bayelsa

For instance, flood recently sacked over 5000 people in two communities in Sagbama and Kolokuma/Opokuma Local Government Areas of Bayelsa State. The flood which occurred as a result of the overflow of River Nun affected Okorozi community in Sagbama and Odi in Kolokuma/Opokuma LGs. In Okorozi, many homes were affected, forcing them to paddle their canoes to neighboring communities in search of refuge.



Also affected were the Community Secondary School and the Corps members' lodge which were completely submerged. Checks indicated that most of the Corps members serving in the community have since abandoned their primary assignment and relocated to Yenagoa, the state capital.

## **5. DEVASTATING EFFECT OF FLOODING**

In the last three decades, the impacts of flooding have increasingly assumed from significant to threatening proportions, resulting in loss of lives and properties. Though detailed statistics are not available regarding the losses sustained by the urban dwellers and flood victims, it is obvious from the available records (table 1) that irreparable havocs have been sustained by the citizen of Nigeria due to what has become perennial natural disaster in our cities. Apart from houses that collapse by flooding, schools buildings and bridges sometimes collapse as well. Markets places and farmlands are submerged for weeks and sometimes are washed away.

The devastating effect of floods was not limited to houses and people. Many farmlands both arable and agro-forestry were swept away when schools and market places were submerged for weeks. Some animals lost their lives to flooding when many bridges collapsed and electric poles destroyed.

The effects could be classified as follows;

- Cause, aggravate and precipitate diarrhea water-borne diseases, destroy farms, food and cash crops.
- Make the individual, communities and nation poor through disruption of services and the degradation of agriculture land
- Destroy human life, animal life and properties
- Damage and destroy buildings, bridges, dams, embankments, drains, roads, railways etc.
- Degrade the environment, spread infestations, soil and water are polluted by chemicals.
- Cause soil infertility through leaching and erosion of rich top soil
- Cause fire outbreaks.

## **6. FLOOD EVENTS AND ASSOCIATED HAZARDS IN NIGERIA**

Table 1 vividly reveals that flood has become a major problem in Nigerian cities when the first flood hit Ibadan, the headquarters of old western region, Nigeria (now the capital of Oyo State) in 1948. Subsequently, serious flood disasters have occurred in Ibadan in 1963, 1978, April 30, 1980, 1985, 1987 and 1990. Lagos recorded the first flood in early 1970s and till date, floods have become perennial event in the state. Table 1 also traced the inception of momentous floods in Bauchi, Borno, Kano, and Jigawa to 1988 while Niger, Bayelsa and Delta first experienced hazardous floods in 1999. Since the first flood had been recorded in these states, the problem of flood has continued to

pose serious threat to human existence not only in those states but other states in the country.

From the Table, devastating floods had hit more than twenty one states of the Federation with Borno, Jigawa, Kano, Lagos, Niger, Oyo, Taraba and Yobe States recorded the highest tolls of casualties. It is obvious that more than four thousand houses in over ninety four (94) communities were washed away by floods and rainstorms when more than one million (1 million) people were rendered homeless. The Table also shows an estimate of over one thousand five hundred and forty nine (1,549) people losing their lives to flooding. The report of Sunday Times, August 21, 1988 however, revealed that among those that were mostly affected or killed by floods were children and women.

Previous studies also reported that communications and traffic are interrupted while many land areas are inundated, and industrial plants and commercial establishment are paralyzed during floods. Besides, untold hardship is experienced, especially by the most vulnerable groups (women and school children) whenever there is flood disaster (Oluduro, 1988; Durotoye, 1999; Folorunsho and Awosika, 2001). This revelation suggests minding that if the data of flood disasters in Nigeria were to be available, human mind would not be able to conceive the devastated effect of flooding on man.

**TABLE 1: FLOOD DISASTERS AND ASSOCIATED HAZARDS IN NIGERIA**

S/NO	STATE	DISASTER	ASSOCIATED HAZARD	NO OF PEOPLE AFFECTED	DATE & YEAR
1	Abia	Rainstorm	Houses	500	July 2001
2	Adamawa	Flood	Houses & Farmlands destroyed	500	April 2001
3	Akwa - Ibom	Flood & Rainstorm	367 houses washed away	4000	March 2001
4	Bauchi	Flood	750 Houses washed away, Farmlands destroyed	Not available	August 1988
5	Bayelsa	Flood	Houses, Schools, Markets & Farmlands submerged	2/3 of the population	1999 & March 2001
6	Borno	Flood	Houses & Farmlands	Not available	August 1988,

			destroyed		June/July 2001
7	Delta	Flood & Rainstorm	Houses, Schools, Markets & Farmlands submerged	Half of the population	1999, March/April 2001
8	Edo	Flood & Rainstorm	560 Houses destroyed	820	March 2001
9	Ekiti	Flood & Rainstorm	Public Schools & 890 houses destroyed	2100	April 2001
10	Imo	Rain & Windstorm	1000 houses, 150 electric poles & 40,000,oil palm destroyed	Over 10,000 displaced	April 2001
11	Jigawa	Flood & Windstorm	Houses, farmlands & animals destroyed	35,500 displaced in 1988; 450,150 displaced in 2001	1988, March, April & August 2001
12	Kano	Flood & Windstorm	Schools, Houses, Farmlands & animals destroyed	300,000 displaced in 1988, 20,445 in 2001	1988, 2001
13	Kogi	Flood & Rainstorm	Houses, Schools & Farmland destroyed	1500 displaced	March, May 2001
14	Lagos	Flood	Buildings collapsed,markets submerged, propertries destroyed.	Over 300,000 affected	Early 1970's Till Date
15	Niger	Flood & Rainstorm	Houses, Schools, animals & farmland affected	200,000 displaced	1999 & 2000
16	Ondo	Rainstorm	Houses & schools destroyed	800 affected	April 2001
17	Osun	Rainstorm	Houses & schools destroyed	1700 affected	April 2001
18	Oyo	Ogunpa Flood	500 Houses demolished, properties destroyed &	50,000 affected	1948,1963 ,1978,1980,1985,1987 & 1990

			bridges collapsed.		
19	Taraba	Flood	80 Houses totally swept off. 410 houses extensively destroyed	More than 50,000 displaced	August 2005
20	Sokoto	Flood, Fire, Windstorm	Houses & Farmlands destroyed	16,000 affected	July 2001
21	Yobe	Flood, Fire & Drought	Houses & Farmlands submerged, Houses razed, animals affected	100,000 affected	April & Sptember, 2001
22	Zamfara	Flood	Building submerged, Farmlands destroyed, properties damaged	12,398 affected	July 2001

## 7. BENEFITS OF FLOOD

As many residents in Lagos and Ogun states have now been displaced as a result of flooding believed to have been caused by the release of water from Oyan Dam Ogun state, hunters, fishermen and hawkers are cashing in on the disaster to make money. The flood had a positive effect on their business. According to the fishermen they do not need to paddle their canoes to the far end of the river before cashing fishes. According to them, when the water level of a river increased more fishes tried to swim ashore. They said this natural phenomenon explained why fishes were always abundant during the rainy season and added that fishing in flooded river was more hectic because tidal waves could affect the movement of canoe. Although they sympathize with people that have lost their property and homes, the flood has made my business a boom, now they catch more fishes than before. Even in areas where they could not fish before because of the shallow state of the river. They now catch big fishes there because they are been pursued by the flood.

The Hunters were not left out in this. Since the flood, they claim that their traps caught more animals than it used to. Animals, chased by the floods, were relocating to dry land. According to them, it was only wise for hunters to relocate their traps, adding that the advantage in this was that hunters could now concentrate on the limited areas that had not been affected by the floods. The reason was that while the flood is surging forward, animals run away from it and ended up being caught up by their traps.

## 8. PREVENTIVE AND MITIGATING MEASURES

### When Looking for Plots for building and Construction

Find out if the area suffers often from floods.

Find out how serious, or the level of the previous highest flood.

Check if there are dams up, or close to where you are going to build or live.

Seek expert advice and use appropriate building materials, in flood prone areas and build only in the approved way and in approved areas.

As a responsible citizen,

Help in every way to construct drains and ditches or embankments, to protect buildings, constructions, utilities etc.

Never put refuse or solid materials in drains, and discourage others from doing so.

Always help to desilt or clean gutters or drains and encourage others to do the same.

Identify a higher place where you can run to during floods.

Prevent becoming a victim to floods

Know that no amount of sympathy and relief can make up for the pain, grief and the losses you will suffer from flood disaster.

Educate yourself and others about floods, know the signals and behave as you are directed.

Don't remove plants or trees unnecessarily, help to replant burnt or cleared forests.

### Measures to be taken by the State and Federal Government

Constantly monitor the risk of flooding; or find a means of measuring or checking water levels of rivers, streams and dams.

Set up effective information or warning systems and centers for the population, especially against dam burst.

Issue and strictly enforce regulations banning building and residing in flood prone zones or areas

Build and develop infrastructure which will prevent or limit floods and protect the population.

Form, train and equip management and rescue teams or provide spill off water to lower the water level dams.

Systematically spill off water (after due warnings) to control the level of water in dams.

Identify cause and plan to prevent its recurrence

Arrange for and provide relief (food, water, clothing, shelter etc)

Check for related water – borne diseases and immunize residents or offer preventive and curative treatments if need be.

Desilt drains; or construct drains where needed.

Remove or demolish all structures obstructing drainage

Demolish badly damaged or destroyed structures and building that can obstruct free

flow of water

Enact or enforce regulations, laws or bye laws to prevent/ mitigate flooding in the area.

## **9. CONCLUSION / RECOMMENDATION**

It is evident in the study that floods had forced millions of people from their homes while thousands of people lost their lives to flooding at different time and locations of the Federation.

Since some parts of Nigeria are situated in low-lying areas, which can be submerged during heavy rains, such areas can adequately be coped with rather than being controlled or mitigated. However, studies could be geared toward flood control measures in low-lying areas.

In conclusion, there is an urgent need for a collaborative effort of both government and stakeholders to support town planning, engineering and other professional agencies to combat flooding in Nigeria to avoid its long-range consequences. For every individual, develop your plot with deep or wide drainage system, and don't dump wastes in the waterways (it's perilous to you in your living domain. The media should also assist in educating the public on flood consequences.

“The environment remains our most valued possession and legacy which we must all strive to protect. Let us all join hands in protecting our common interest.”

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## **BIOGRAPHICAL NOTES**

Mrs. Angela Kesiena Etuonovbe has a B.Sc. (Hons) degree in Surveying, Geodesy & Photogrammetry from the University of Nigeria, Enugu Campus. She is a Registered Surveyor and the first female Surveyor in Private Practice in Delta State, Nigeria. With over fourteen years of experience in the practice of Surveying, Engineering and Mapping. She also has a Master in Business Administration (MBA), and just concluded a master degree program on project management (M.Sc. Management) from the Delta State University, Abraka.

She is a Federal Surveyor, a consultant of no mean repute, a prolific writer, a Lady of the Knights of Saint Mulumba Nigeria, Assistant Secretary General of the Nigerian Institution of Surveyors, currently the chair elect (2011 -2014) Working Group 4.5 (Hydrography and World Event) of the International Federation of Surveyors (FIG), immediate past President, Women – In – Surveying, Nigeria.

She is an icon to female Surveying Students and has been championing the course of Gender inequality in the Survey Profession in Nigeria.

She has presented various papers at the International Federation of Surveyors (FIG) events.

She had authored eight informative, educative exciting and highly spiritual books currently on the Bookshelves. Over 5000 copies of God the Father Loves You Personally have been printed in the past years and distributed freely to prisons, hospitals, communities, youths, schools and the needy.

She is excited at challenges the Survey challenges not an exception.

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