

## A REVIEW OF THE ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS OF FLOODS IN NIGERIA

<sup>1</sup>Eyimoga, H.A, <sup>2</sup>Adejoh, M.I, <sup>3</sup>Omalle, J.A, <sup>4</sup>Ibrahim, A.K <sup>4</sup>Kuye ,O.B and <sup>5</sup>Adah, J.A

<sup>1</sup>School of Preliminary Studies, Kogi State Polytechnic, Lokoja, Nigeria

<sup>2</sup>Department of Business Administration, Sale University, Lokoja, Nigeria

<sup>3</sup>Department of Soil and Land Resources Management, Federal University, Oye Ekiti, Nigeria

<sup>4</sup>Department of Soil Science, Federal University, Oye- Ekiti, Nigeria

<sup>5</sup>Department of Geography and Environmental Studies, Ignatius Ajuru University of Education. Rumuolumeni ,  
Port Harcourt, Nigeria

(Eyimoga, H.A ; [heleneyimoga@gmail.com](mailto:heleneyimoga@gmail.com))

### ABSTRACT

*The article reviewed the environmental and socio-economic impacts of floods in Nigeria. The concept of flood and concept of flood vulnerability. The effects of floods on the environment, traffic/transportation, businesses, health, agriculture as well as the benefits of floods were highlighted. Such as the use of flood waters for irrigation, fisheries, domestic use etc. It was concluded that floods no doubt has caused colossal damage to the environment and socio economic lives of Nigerians. Human activities are responsible for some of the flood occurrences in Nigeria.*

*Enactment and enforcements of strict environmental and land use acts to curb harmful environmental and land use practices.*

*Adequate and timely preparation for floods , especially where they are annual occurrences were recommended*

Keywords : Environmental, Socio Economic,, Impact , Flood, Businesses, Nigeria

### INTRODUCTION

According to the World Meteorological Organization(WMO) floods are among the most common natural disasters and are responsible for the highest level of destruction to human lives and properties (WMO, 2017) accounting for about 30% of the world's disasters each year. On a global scale flood has affected approximately 250 million people worldwide and causing US\$ 40 billion in losses on an annual basis according to the Organisation for Economic Co-operation and Development. (OECD, 2015) In 2016, almost 23.5million people were displaced due to mainly storms and floods in the Asia pacific region alone according to World Meteorological Organization (WMO, 2016).

Flood therefore is defined as an abnormal scenario of water flow above the original confines of a defined water body (Awe *et al* 2020). According to The International Panel on Climate Change (IPCC, 2012) flood is the overwhelming of the normal confines of all bodies of water or the accumulation of water over areas that are not normally infiltrated. and variability ,rapid urbanization, poor drainage

channels, poor waste management practices, dam collapse or spill, and poor town planning have all contributed to the increase of flooding events and flood risk in various regions(Dambe, 2020, Niekerk and NemaKonde, 2017).Flood is majorly associated with extreme weather events all over the globe cutting across all continents.In addition are, changes in land use and land cover, inadequate flood risk awareness, limited efforts geared towards flood disaster risk reduction in many places, exposure and vulnerabilities of large numbers of human population to limited natural resources (Aid, 2006; Giuliani and Peduzzi, 2011).

Climate have never been static globally, it has been dynamic since inception, but there has been an increasing concern in the last few decades due to the alarming rate of its recurrences, swiftness and severity of its consequences on man and his environment (National Research Council- NRC, 2010). According to Haider(2019) Constant temperature rise, more contrasting rainfall characteristics and a strong spatiotemporal variability (intensity, quality, duration and general pattern) is responsible for the intensification of disaster like flood, desertification and drought with damaging consequences. Increase in the rate of evaporation as a result of increased temperature, leads to greater availability of water vapour in the atmosphere which in turn causes an increase in rainfall intensity, amount, and duration (Boe, *et al*) and subsequently extreme runoff and rise in river/ stream volume and disaster events like flood.

Flooding is a major problem in African cities especially urban centers, which was why Olanrewaju *et al* (2017) stated in their studies that Action Aid (2006) projection ,opined that by2030 majority of Africa's population will live in urban areas. With this, the frequency of flooding in Africa is also expected to increase as climate continues to change. The recurring floods have affected many regions in Sub-Saharan Africa and contributed to the existence of several flood-risk hotspots in many countries like Ethiopia, Gabon, Equatorial Guinea and many sub national areas in central and West Africa, as well as Madagascar and Mozambique (world bank,

2020;Zeineddine and Ovidiu 2020)claiming several lives, displacing people and destroying properties worth millions of dollars.

Nigeria is one among the developing countries of Sub-Saharan Africa whose economy and livelihoods have greatly been affected by flooding incidences (Aderogba, 2012 ).The country has recorded series of flooding events annually with catastrophic consequences either as coastal, river, flash or urban floods. For the past decades in Nigeria, thousands of lives and properties worth millions of Naira have been lost directly or indirectly to reoccurring flood annually. Some of these flooding events include the Ibadan flood of 1963with estimated damage worth over 30million naira and about 100 persons affected by floods of, 1978, 1980, 1982, 1986, 1990, and 2011. The Ilorin floods of 1973,1976,1979, and2011 (Ifabiyi and Ashaolu, 2015). Lagos on the other hand between 2011and 2012 witnessed 8 major flood events which claimed over 30 lives and lots of properties. The 2012 flooding event in Nigeria was an unprecedented one that caused a lot of havoc. Lokoja was one of the worst affected towns with about 24,476 houses damaged, 102,567 persons displaced and about 96 people killed with an estimated loss of 1.2 billion naira. Other areas within Kogi state that were also affected include Idah, Ibaji, Bassa, and Baganna.(Suleiman *et al.*, 2015)

Flood is an inevitable natural disaster that cannot be completely prevented or stopped, being a natural event continually induced by human activities, lifestyle and interferences. The negative impact of flood can be reduced through effective management covering all flood management timelines of preparedness, mitigation, evacuation, adaptive and recovery measures.

Nigeria has witnessed several flood disasters in different parts of the country. Precisely in2010, approximately 1550 people died and 258,000 displaced by 19 flood events (Agbola *et al.*, 2012). Two years later in 2012the worst ever recorded flood occurred National Emergency Management Agency (NEMA, 2013). The flood of 2012 affected 7.7Millionpeople, about597,476 houses submergedin 256 local government areas and about 18,282 persons injured. The flood also displaced 2.3 million and caused the death of about 363 people in Nigeria (Iliya, 2013, NEMA, 2013, Cirella and Iyalomhe, 2018), in addition an economic loss of 2.6 trillion naira (about US\$ 6.5 billion) despite all efforts previously by the government to make the environment more habitable

Flood in Nigeria has continued to occur and cause a lot of damage to farmlands, properties businesses and other socio economic facilities and lose of lives along side inflicting numerous injuries and hardship on the people .(Agboskhes *et al.*, 2014)

This article reviews the impacts of floods to the environment and the socio economic lives of the people.

## 2.0 LITERATURE REVIEW

### 2.1 Concept of Flood

Flood is an overflow or backwash of water that submerges a land that is usually dry and saturated that occurs in different categories and extent. Flood is a natural hazard like drought and desertification which occurs as a result of an extreme hydrological (run off from heavy precipitation) event (Nwafor, 2006). The term flood as also defined by Sada and Odemerh (1988) represents high rate of water discharge which often lead to inundation of land adjacent to stream often caused by intense or prolong rainfall. Zbigniew *et al* (2013), however went further to describe flooding as overflowing of the normal confines of a stream or other body of water or accumulation of water over areas that are not normally submerged. These then means a flow of water over areas which are habitually dry which may result from storm surge, melting of glacier, snow melt or heavy rainfall. It is a temporary covering by water of land normally not covered by water. A condition of flood also occur when the discharge of a river cannot be accommodated within the limits of its normal channel, water thus spreads over adjoining low-lying grounds on which farmlands or urban structures including residential areas may be occupied (Abashiya *et al.*, 2017, Strahler and Strahler, 2003).This include floods from rivers, mountain torrents, Mediterranean ephemeral water courses, and floods from the sea in coastal areas, and include floods from sewerage systems.

Floods are the most common natural disasters and their incidence and negative impact are on the increase worldwide (Paul, *et al.*, 2010). Flood can strike anywhere without warning, and is generally a temporary condition of partial or complete inundation of normally dry areas from overflow of inland or tidal waters or from unusual and rapid accumulation or runoff (Akintoye *et al.*.,2016).

The terms floods, flood hazard, and flood risk cover a broad range of phenomena. The terms such as flood risk and flood losses are essentially our interpretation of the negative economic losses and social consequences of natural events.

### 2.2 Concept of Flood vulnerability

According to Wikipedia vulnerability is the extent to which a community can be affected by the impact of a hazard or exposed to the possibility of being attacked or harmed, either physically or emotionally and the main construct in flood risk management. Vulnerability is considered in the study of Flood Vulnerability Index (FVI) as the extent of harm, which can be expected under certain conditions of exposure, susceptibility and resilience (UNESCO-IHE). In this context, it can be defined as the diminished capacity of an individual or group to

anticipate, cope with, resist and recover from the impact of a natural or man-made hazard such as flood which arises when people are isolated, insecure and defenceless in the face of risk, shock or stress (International Federation of Red Cross and Red Crescent Society, 2017). Within a country or region, some communities are more vulnerable than others, and within some communities, individuals may be more or less vulnerable those who are most vulnerable to the flood hazard may be unable to escape the risk due to limited resources (money, knowledge, work flexibility etc.) (Geographical Association (GA)2012).

### 2.3 Empirical Literature Review

The World Meteorological Organisation, WMO (2017), identified flood as one of the commonest natural disasters with the highest impact on properties and human life worldwide. The world however, in the last few decades has experienced an increasing number of flood disasters with devastating effects. These include the Asian Tsunamis of 2004 and 2011 (WMO, 2017), Hurricane Katrina in the USA 2005 which resulted in loss of hundreds of thousands of lives and properties, rendering many persons homeless in a short span of time. In 2010, the Indus River in Pakistan spilled over its bank as a result of the heavy monsoon rains and displaces millions of People (WMO, 2017).

Flooding in Nigeria is an annual event occurring along the river banks and coastal areas. But, the 2012 flood was a major environmental disaster. The 2012 flood disaster was an exceptional one in the last 40 years (Suleiman *et al.*, 2019). Most part of the middle belt and adjoining States along Rivers Niger and Benue were devastated by this event causing huge destruction to the rural and urban infrastructures (farm lands/ crops, roads, buildings, drainages, bridges, power lines etc) and socio-economic lives of the areas. It also had devastating health implications on communities, thus increasing the cases of malaria and waterborne diseases like Cholera and typhoid. Over 7 million persons were affected by the flood (Iliya, 2013). It resulted in 597,476 houses in 256 Local Government Areas in Nigeria being submerged (Rigasa *et al.*, 2015), and in addition about 2.3 million persons were displaced and 363 persons died as a result of the 2012 flooding. Events of flood are of a great challenge for sustainable development in Nigeria (Zana and Dunica, 2018).

This constant occurrence of flood disaster has created an increased interest in the understanding, monitoring, assessment and management of flood events around the world. Satellite data however have been used extensively for the study and assessment of flood risk, hazard and disaster. Clues as to causes and precautions to be taken to prevent future flood disaster may be gotten from information on extent of damage from satellite data (Ocholi 2014).

Flood is defined as an uncontrolled over flow of water (Rivers, lakes, coastal water, urban water etc)

that covers land that is usually dry for a specific period of time (Cambridge Dictionary n.d). Ocholi (2014) defined flood as a hydrological event characterized by high discharges and high waters level that can lead to inundation of dry land adjacent streams, rivers, lakes, wetlands and other water bodies. The duration of Flood may range from several hours to several weeks depending on the cause, the general condition of the affected area and the degree of development and urbanisation (Zana and Durica, 2018). Flood are caused by intense rainfall, snow melt, failure of flood protective structures (dams, embankment system), landslide, ice jam, high tides, storm surge, and human activities such as deforestation, indiscriminate disposal of waste, drainage blockage, poor town planning and indiscriminate urbanization (Falconer, and Harpin, 2002).

Several scholars are of the opinion that absolute flood protection cannot be achieved (Kubal *et al.*, 2009). Flooding and its effects however can significantly be mitigated if there is proper understanding of specific structural, land use and climatic conditions. And after which strategic steps can be taken to address the unsuccessful measures and lack of measures which ought to have been in place right from the onset to prevent or significantly limit the impact and destructive effects of flooding. A major consequences of the lack of a robust water management strategy is the challenge of recurrent flooding ravaging large parts of the country during the rainy seasons, causing serious damage, loss of life and property worth billions (Oladokun & Proverbs, 2016)

## 3.0 METHODOLOGY

Literature materials on the impacts of floods on the environment and the socio economic lives of the people were sourced from journals , Conference proceedings , bulletins , books, government documents etc, they were collated and thereafter reviewed

## 4.0 DISCUSSION AND REVIEW

### 4.1 Environmental and Socio Economic Impacts of Floods in Nigeria

#### 4.1.1 Effects of flooding

Flooding affects every section of the environment, people, economy and systems in any city where it occurs; some of these impacts are summarized below:

#### 4.1.2 Economic effects

1. Causes destruction to Public buildings, Public utility works, housing and house –hold assets.
2. Results in loss of earnings in industry and trade
3. Causes loss of earnings to petty shopkeepers and workers
4. Leads to loss of employment to daily earners

5. Leads to loss of revenue due to Road, Railway Transportation Interruption

6. Causes a hike in prices of essential commodities.

7. After flooding, government and nongovernmental organizations have to put in a lot of resources to aid affected people e.g., police force, fire control, and aid workers purposely for restoration of flood affected structures, persons, live-stock etc. Flooding usually causes great economic loss to the states, individuals and to the society generally( Ocholi , 2014).

#### 4.1.3 Environmental Effects

Flood results to imbalance of eco-system of the area it occurs. Causes damage to the surroundings environment, forests, ridges, wild-life, zoo, urban community-trees, water bodies, shrubs, grass, and fruits/vegetables. Flooding also results in loss of biodiversity, some wildlife migrate to other areas or even die due to change and disruption of habitats9 Ocholi *et al.*, 2014)

#### 4.1.4 Effect on Traffic

Flooding results in the damage and collapse of roads, collapse of bridges which further leads to traffic congestion limiting the day-to-day activities of the people.

#### 4.1.5 Effect on Human Beings

1. **Human lives:** Every year floods incidence claims hundreds and thousands of lives around the world. A good number of persons are left homeless and forced to move to camps leaving their ancestral homes culture and investments.

2. **Psychological impact:** Persons of all ages left with various impacts from flooding incidence usually suffer psychologically as a result of the aftermath effect ie been stranded without homes, loss of businesses, loss of properties, loss of means of livelihood, diseases etc. this psychological impact may last for a whole life time.

3. **Disease:** Flooding usually is accompanied with infectious diseases like, fever, pneumonic plagues, dysentery, common cold, cholera, diarrhea, typhoid, worm infections etc. The chances of food poisoning is also increased as flood water may flow into stored food and ingested without proper cooking and also due to interrupted power supply which may cause spoilage of stored food in the refrigerator.

4. **Public Inconveniences:** The people in affected areas are faced with a lot of inconveniences due to several destructions to public utilities ie roads, schools, hospitals, offices etc. Flooding cause's impairment to transportation and communication system which leaves the people stranded e.g. school children, college students, office goers, vegetable, milk venders etc. There is difficulty in making basic and essential commodities reach the common persons as a result of the dysfunctionality of the system. This results either to hike in prices of

commodities and starvation of the poor common persons.( Rigasa *et al.*, 2015)

#### 4.2 Benefits of Flooding

Generally flood is seen as been only destructive to man, his properties, his economic activities and his environment. While in the actual sense flood is accompanied with a lot of benefits such as ground water recharge, increase soil fertility by providing nutrients in which it is deficient. Flood waters provide much needed water resources in arid and semi-arid regions particularly where precipitation events can be very unevenly distributed throughout the year. Ecosystem maintenance around the river corridors is a function of flooding and a key factor in maintaining floodplain biodiversity. Flooding adds a lot of nutrients to lakes and rivers which leads to improved fisheries for a reasonable number of years, and also because of the suitability of the floodplain for spawning, flooding makes it easier. Fishes also make use of flood waters to reach new habitats. Likewise, birds also profit from the boost in production caused by flooding like fishes.

Periodic flooding was and is crucial to the well-being of ancient town and cities along the Tigris-Euphrates Rivers, the Nile River, the Indus River, the Ganges and the Yellow River, and Lokoja among others. The viability for hydrological based renewable sources of energy is higher in flood prone regions ( Ocholi, 2014)

### CONCLUSION AND RECOMMENDATIONS.

#### CONCLUSION

Floods no doubt has caused colossal damage to the environment and socio economic lives of Nigerians Human activities are responsible for some of the flood occurrences in Nigeria

#### RECOMMENDATIONS.

Enactment and enforcements of strict environmental and land use acts to curb harmful environmental and land use practices.

Adequate and timely preparation for floods , especially where they are annual occurrences

#### REFERENCES

Aderogba, K. A. (2012). Qualitative studies of recent floods and sustainable growth and development of cities and towns in Nigeria. *International Journal of Academic Research in Economics and Management Sciences*, 1(3), 1.

IPCC(IN FULL), (2012) Summary of policy makers. In: Managing the risks of extreme events and disasters to advance climate change adaptation field, C.B.V., Barros, T.F., Stocker, D., Qin, D.J., Dokken, K.L., Ebi, M.D., Mastrandrea, K.J., Mach, G.K.,

Plattner, S K., Allen,

- NEMA (IN FULL), (2012) The Impacts of Flooding on Socio-Economic Development and Agriculture in Northern Nigeria: A Case Study of 2012 Flooding in Yola and Numan Areas of Adamawa State Nigeria. *Int. J. Sci. Eng. Res*, 6, 1433-1442.
- Nwafor, J. C. (2006). Environmental impact assessment for sustainable development: the Nigerian perspective. Environment and Development Policy Centre for Africa (EDPCA).Enugu: EL 'DEMAK pubs, 359-394.
- Ocholi, M., Agbonkhese, O., Agbonkhese, E. G., Aka, E. O., Joe-Abaya, J., &Adekunle, A. (2014). Flood menace in Nigeria: impacts, remedial and management strategies. *Civil and Environmental Research*, 6(4), 32-40.
- Ocholi, S. O., (2014)Application of Geoinformatics for mapping flood vulnerability in Lokoja. Unpublished Masters degree thesis submitted to the Fac. of Soc. Sci. Kogi state University Anyigba .pp 1-113.
- OECD, (2016). *Financial Management of Flood Risk*; OECD Publishing: Paris, France, 2016.
- Olanrewaju,R., Ekiotuasingham,B., and Akpan, G, (2017) Analysis of rainfall pattern and flood incidences in warri metropolis, nigeria. *Geography, Environment, Sustainability*,Vol.10, No 4, p. 83-97
- Suleiman, Y. M., Yahaya, T. I., &Tsado, E. K. (2020). Daily extreme rainfall indices and their impact on rice yield in parts of North-central State of Nigeria. *Toure*2014,
- WMO, (IN FULL), (2017). WMO world record lightning extremes: Longest reported flash distance and longest reported flash duration. *Bulletin of the American Meteorological Society*, 98(6), 1153-1168.
- Zbigniew W. Kundzewice S.K., Sonia I.S., John H., Newille N., Pascal P. (2013). Flood Risk and Climate Change: Global and Regional Perspective. *Hydrological Science Journal* 59 (1) 1 -28
- Zeineddine N and Ovidiu A.D(2020)Rainfall Variability and Trend Analysis of Rainfall in West Africa (Senegal, Mauritania, Burkina Faso)*Water*, 12,1754; [www.mdpi.com/journal/water](http://www.mdpi.com/journal/water)