



ISSN NO. 2320-5407

Journal homepage: <http://www.journalijar.com>

INTERNATIONAL JOURNAL
OF ADVANCED RESEARCH

RESEARCH ARTICLE

CROSS CASE ASSESSMENT OF THE IMPACTS OF FLOODING ON SOCIO-ECONOMIC DEVELOPMENT AND AGRICULTURE IN KOGI STATE

Joshua Williams Kwari; Solomon Ayuba; Latseumso David Denis

Faculty of Engineering and Technology, Dept of Civil Engineering, Federal University Wukari, P.M.B 1020 Wukari Taraba State; Department of Civil Engineering Federal University Wukari; Department of Biological Sciences, Faculty of Pure and applied Sciences, Federal University Wukari, P.M.B 1020 Wukari, Taraba State.

Manuscript Info

Manuscript History:

Received: 15 June 2015
Final Accepted: 22 July 2015
Published Online: August 2015

Key words:

Flooding, Agriculture, climate change and Socio-Economic Development

*Corresponding Author

Joshua Williams Kwari

Abstract

Flooding has been an environmental problem that is being faced globally. It threatens the environmental, social and economic well-being of the affected areas. Nigeria has been facing the menace of flooding in both urban as well as rural areas. Northern Nigeria is one of the worst hit areas that are affected by flood annually despite the dry climatic condition of the area. This research assesses the causes of the 2012 flooding disaster in Lokoja and Ibaji areas respectively and how it has impacted on agriculture and socio economic activities of the people living in these areas. A cross section analysis was made and the finding revealed that both the urban and the rural areas showed the same policy and laws on flood control and land use. Yet these areas were the worst hit and were placed on Category 'A' list of relief materials and shelter during the flood. The trend of flood occurrences indicates that climate change is one of the major causes of flood in those areas. However, further study revealed that the communities and properties washed away were situated along the flood plains and were at risk of inundation during the rainy season. It also discussed the effect it has on socio-economic and environmental well being of the victims affected and also the huge impacts on agriculture and food security. Several issues together complicate and make the impact worse but the basic solution is a sustainable approach by implementing laws and policies that should be adhered to strictly. This cannot go without saying that for the laws to be accepted; the government has to play a vital role in creating awareness and also providing basic social amenities like homes built away from flood plains.

Copy Right, IJAR, 2015,. All rights reserved

INTRODUCTION

Climate change and its impact have evolved so rapidly from a future evasion to a frightening reality. Climate change is believed to be a long time change in the atmospheric temperature and weather distribution in general. However, over the last twenty to thirty years the impact of climate change through global warming has been drastic and poses great concern and imperatively the need to seek sustainable measures to tackle the situation (Jake and Joe 1999). According to the National Academy of Science (2008), there is a growing concern about global warming and the impact it will have on people and the ecosystem on which they depend. Temperatures have already risen 1.4°F since the start of the 20th century with much of this warming occurring in just the last 30 years and temperatures will likely rise at least another 2°F, and possibly more than 11°F, over the next 100 years. This warming will cause significant changes in sea level, ecosystems, and ice cover, among other impacts. In the Arctic, where temperatures have increased almost twice as much as the global average, the landscape and ecosystems are already changing rapidly.

There is no doubt that climate will continue to change throughout the 21st century (Maslin 2004) and beyond, but there are still important questions regarding how large and how fast these changes will be, and what effects they will have in different regions. In some parts of the world, global warming could bring positive effects such as longer growing seasons and milder winters. Unfortunately, it is likely to bring harmful effects to a much higher percentage of the world's people. For example, people in coastal communities will likely experience increased flooding due to rising sea levels (Dell et al., 2008) and heavier down pour of rains. The impact of climate change is felt in both developed and developing countries but the impact is felt the most in developing countries due to lack of adequate infrastructures to respond to it (IPPC, 2007). The focus of this research will be on flooding in northern Nigerian which has been an ongoing event for decades and automatically affects the social, economic and environmental well-being of the affected regions and country at large.

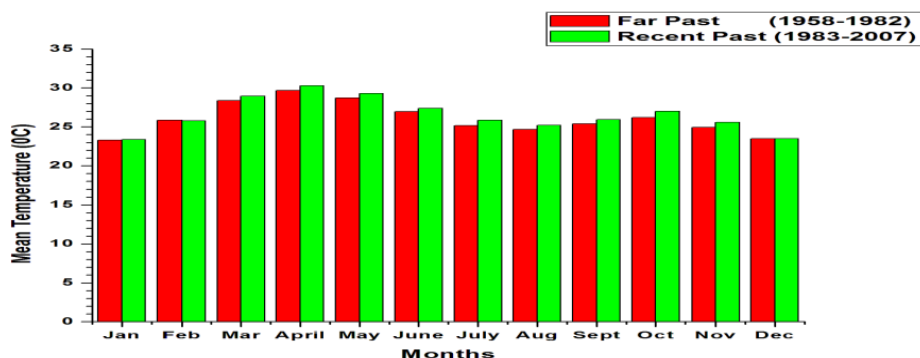
1.0 CLIMATE CHANGE IN NIGERIA

In the study, 'Combating Climate Change in Nigeria', Medugu (2009), noted that from the 4th IPCC research and report conducted in 2007, it was revealed that Africa will be affected the most by the effects of climate change not due to emitting the highest amount of greenhouse gases but because of insufficient amenities to tackle the effects. Medugu stated further, that Nigeria being a part of Africa is already being affected negatively by the climate changes and is affecting millions of people, socially, economically and environmentally. Crop production in Africa is likely to decrease by 50% by 2050 due to climate change, especially since the agriculture system in Africa is predominantly dependent on rainfall which is constantly changing in pattern (Ibrahim et al., 2010 and Jones and Thornton 2003). Nigeria is vulnerable to the impacts of climate change largely because of the population of Nigerians that are engaged in agricultural trades; almost 90% of agricultural practices depend solidly on rainfall for farm yield (Ibrahim et al., 2010)

Over the centuries, Nigeria's climate has obviously changed as observed through weather patterns leading to extreme events such as drought and flooding (Bello et.al 2012). In 2011, the Building Nigeria's Response to Climate Change (BNRCC) Project team drafted an adaptation strategy document called National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPAN-CCN 2011). In the document records of rainfall and temperature patterns from the Nigerian Meteorological Agency (NIMET) were assessed over the span of 59 years (1941 to 2000) and recorded changes in both temperature and rainfall. NIMET also estimated the predicted temperature and rainfall for the future in Nigeria using the climate trends over the years. The following results for temperature and rainfall were predicted;

Temperature: the general prediction is increase in temperatures. An increase in temperature of 0.04 degree Celsius is depicted till 2046-2065 with an increase to 0.08 degree Celsius after 2050. Again the hottest regions will be the north eastern region with a temperature rise of 4.5 degrees by 2081-2100.

FIGURE 1: Annual Variation in Temperature over Northern Nigeria

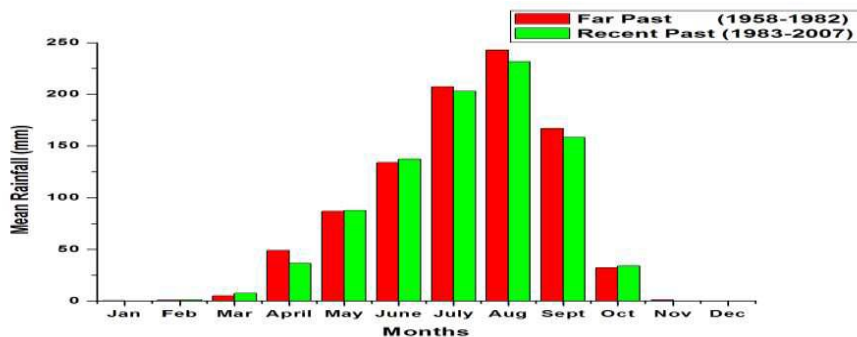


SOURCE: NASPAN-CCN 2011.

Rainfall: the rainfall trends showed a variation across the country with more rainfall in the south and drier climate in the northeast. In the southern regions, the average increase of rainfall will be observed at 15cm annually during

the period of 2046-2065 while an average decrease of 7.5cm annually will be observed in the north (NASPAN-CCN 2011).

FIGURE 2: Annual Variation in Rainfall over Northern Nigeria



SOURCE: NASPAN-CCN 2011.

2.1 AGRICULTURE IN NORTHERN NIGERIA

In spite of the growing importance of oil, Nigeria's economy has remained an agrarian economy, with agriculture still accounting for significant shares in Gross Domestic Product (GDP) and total exports, and also providing employment to a majority of the country's population. According to Farauta et al., 2012, about 70% of the nation's population relies on agricultural production as a major trade. Sadly, even with a bulk of the country's population involved in agriculture, Nigeria is a net importer of food from countries around the world like Asia, running into billions of Naira annually (Dimelu et.al, 2011). Notwithstanding the amount of food imported, agriculture is the main source of food for the nation's consumption which is predominantly dependent on the annual rainfall hence making the agricultural produce vulnerable to the impacts of climate change due to changes in weather patterns (NFNC, 2003). Similarly, cattle and poultry predominantly bred in the northern Nigeria are also equally vulnerable. This agricultural vulnerability has been defined by the Intergovernmental Panel on Climate Change, 2007 (cited by Ibrahim et. al., 2010) 'as the risk of negative consequences of climate change that are difficult to ameliorate through adaptive measures'. It's important to note that about 90% of the food produced for the country is from the rural areas whose poverty level is severe, about 80% with women playing a major role. The percentage of women involved in agricultural practices is 72% and males are 44% (IFAD, 2011). According to Farauta et al., 2011, a significant portion of the agricultural sector in Nigeria involves cattle herding, fishing, poultry, and lumbering. There was a record of 12.2million pigs, 700,000 donkeys, 250,000 horses, and 18,000 camels in 1987. These animals are predominantly bred in northern Nigeria, and owned mostly by rural dwellers. The decline of agricultural produce has been due to environmental degradation and water pollution as a result of climate change. Today, the figures may have changed but the nation depends on the northern regions for animal rearing, especially cattle for dairy products.

2.2 IMPACT OF CLIMATE CHANGE ON AGRICULTURE

The major climate change threat in Northern Nigeria has been desert encroachment which has led to severe drought, (FME, 2004) which has also brought about a quick depletion of resources such as surface water, flora and fauna in the region (Obioha, 2009). This condition puts further stress on the people in the regions affected. Another negative effect is the exploitation of the already depleting resources by deforestation which results in the formation of sand dunes/Aeolian deposits in the Northern axis of Nigeria (Bello et.al 2012). Conversely, flooding is a major concern for those living along the coastal regions and this is destroying farmlands, altering the ecosystem and this spreads diseases due to contamination of water. Odjugo 2010 pointed out that these climate/environmental situations have forced some farmers to seek other means of livelihood which will in turn result in reduced yield from agriculture. However, flash floods occur annually in the north (Medugu 2009), the frequency and damage especially in recent times has become alarming. Climate change is likely to increase the frequency and severity of floods, droughts and other events such as desert encroachment and drastic changes in rainfall patterns and temperature. This will

inevitably alter the agricultural yield in crops and livestock (Nzeh et al., 2012) which will lead to socio-economic problems like migration and unemployment (NFNC, 2003).

Studies reveal that agriculture is the most vulnerable to the effects of climate change (Nzeh et al., 2012) especially in developing countries where the bulk of the population is invested in agricultural practices and also mostly in rural areas (Apata et al., 2010). In the above context, it can be safe to say that Nigeria is at the forefront of risks of climate change since 70% of its 167,000,000 citizens depend solidly on agriculture as a major source of livelihood (Adesina, 2011). Nigeria is currently the World's largest producer of cassava (Ibrahim et.al, 2010), and West Africa's largest producer of rice. The main cereals (corn, guinea corn, millet, wheat and sorghum) produced by the country are predominantly grown in the north (Afolabi 2013). Extreme weather events such as drought and floods pose great threats on food security in Nigeria. When the Sahel savannah regions (extreme north) of the country suffered drought in the 1970's and 1980's, the tremendous effect on agriculture was felt throughout the region and country at large. Close to one million livestock were lost, affecting meat and dairy supply throughout the country (Nzeh et al., 2012, Ibrahim et al, 2010 and BNRCC 2011).

2.3 FLOODING

Flood hazards occur naturally, but the level of impact, damage and losses are as a result of human activities (Action Aid, 2006). Flooding may be referred to as a comparatively high flow of water that over-tops the natural or artificial bank in any reach of stream. It is regarded as “an overflow or inundation that comes from a river or other body of water and causes or threatens damage or simply as a “deluge of inundation” (Bronstert 2003). Floods may happen gradually and also may take hours or even happen suddenly without any warning due to breach in the embankment, spill over on heavy rains. Therefore, flood occurs when surface water covers land that is normally dry or when water overflows normal confinements. Flooding has been identified as one of the major factors that prevents Africa's growing population of city dwellers from escaping poverty and stands in the way of United Nations 2020 goal of achieving significant improvement in the lives of urban slum dwellers (Action Aid, 2006). This is because many African cities lack the infrastructures to withstand extreme weather conditions. Poor urban planning together with other urban governance challenges contributes to making African urban slum dwellers most at risk (Adelekan 2009). Flood is therefore caused by interplay between natural and manmade factors in the environment; they are natural phenomena and disasters. They form part of the normally occurring range of stream flow conditions (Olanrewaju and Fadairo 2003). ‘Flood is therefore a disaster because it results in: Loss of lives, Loss of agricultural products, Loss of soil fertility for agriculture, Demolition of buildings and rendering many homeless, Destroying livestock and other valuable assets. Cholera and other health related problems’ (NEMA, 2012).

2.4 AN OVERVIEW OF FLOODING IN NIGERIA

The threat to lives and property by flood is now becoming an annual event in many urban and rural areas in Nigeria (Olanrewaju and Fadairo 2003). In 2012 however Nigeria experienced severe flooding across the nation destroying properties, farms and displacing millions of people from their homes. The flood was in the rainy season and due to the high intensity of prolonged rainfall this caused dams and reservoirs in riparian countries to fill and overflow with water which triggered a decision by the authorities of the riparian countries to open up the dams and release large amount of excess waters into the Nigerian rivers Niger and Benue (NEMA 2012). The Nigerian Hydrological Services Agency (Sited in Aderogba 2012) described the 2012 floods as the worst flooding disaster the country had ever experienced and can only be compared in magnitude and scale of destruction with those of 1967/68. The Agency recorded peak water level of 12.84m and maximum discharge of 31.692 m³/s at the confluence of Rivers Niger and Benue at Lokoja, Kogi State on September 29, 2012, causing devastating destruction of lives and property together with economic loss in Nigeria. Flash floods are common in Nigeria in the rainy season (May to September) but the months of July and October 2012 were a tragedy in the country as the flooding of this magnitude was not expected. The waters from rivers overflowed their banks and submerged hundreds of thousands of acres of farmland forcing about 1.3 million people from their homes and claimed 431 lives (NEMA 2012). The Nigerian Red Cross reported the displacement of 120,000 people from their homes. Temporary shelters were provided by the government but the displaced residents fled as the shelters too were submerged by floods (NEMA 2012).

Developing nations such as Nigeria are at great risks to flooding hazards due to urbanization which triggers flooding through the construction of buildings along flood channels, thereby restricting free flow of water. Also as urbanization grows, populations of the cities rises, causing even moderate climate changes in storms, winds and rainfall create high flows in rivers due to hard surfaces and buildings (Action Aid, 2006).

2.5 EFFECTS OF FLOODING IN NORTHERN NIGERIA

Flooding is one of the major factors that prevents Africa's growing population of city dwellers from escaping poverty, and stands in the way of the UN 2020 goal of achieving 'significant improvement' in the lives of urban slum dwellers (Action Aid, 2006). The impact based on socio economic development as well as on agriculture is explained below;

2.5.1 Socio economic impacts:

The socio-economic impacts of flooding are felt as soon as floods occur, as it instantly disrupts day to day businesses and activities (Bronstert, 2003). Bariweni et al., 2012, revealed that the floods of 2012 had a major impact on socio-economic life for days, weeks and even months in some areas. Roads and buildings were submerged and victims were trapped due to blockage of road and damaged bridges. Children couldn't go to school, workers couldn't go to work and traders couldn't open their stores at the markets. These automatically took its toll on the economy as businesses were being affected. The damages and destruction of buildings, bridges, dams, embankments, drains, roads, railways, electricity wires/poles, all amounted to billions of Nigerian Naira due to the extent of property damage and infrastructures (NEMA 2012). Health issues also became higher especially in the North. Cholera due to contaminated water and malaria due to stagnant waters all increased and of course, the most vulnerable are the poor rural areas with women and children affected the most (Bariweni et al., 2012 and Agwu and Okhimamhe, 2009). The impact which not only affected the nation as a whole but also the international market was probably the reduction of crude oil production which had gone down by up to 500,000 barrels per day in most of October, due to the floods from the almost 2.5 million to 2.7 million barrels per day (NNPC, 2012).

14 states which lie within the River Niger and Benue were flooded in 2012 and 95 local government areas within the 14 states were affected (NEMA 2012). The year 2011, also had devastating effects on the north eastern states, completely destroying mud houses in the villages and washing away livestock (NASA, 2011). All together, the impact was overwhelming as day to day lifestyles and trades were put on hold. Farmlands, roads, railways, schools, hospitals (including maternity clinics), loss of lives and properties running into several millions of naira were the results of the 2012 floods (Aderogba, 2012). In an official report by the National Emergency Management Agency (NEMA 2012), the following figures were revealed in terms of damages 7,705,378 people were affected, 2,157,419 victims were displaced, 5,800 injured, 32 out of the 36 states affected and homes affected were 597,476.

2.5.2 Impact of Flooding on Agriculture:

Close to a billion people around the globe live in abject poverty characterized by serious hunger (Lobell and Burke, 2012) and majority of this number lies within Africa which is heightened by the conflicts, degradation of resources and poor adaptive skills (IPPC, 2007). With Nigeria being the most populous nation on the African continent (Etuonovbe, 2011), and 70% of this population living in poverty, any unrest or disasters such as flooding will have a huge impact (Agwu and Okhimamhe, 2009) especially on food security which is vulnerable to extreme events such as flooding (Nzeh, et al. 2012). The annual occurrence of floods in northern Nigeria, especially the magnitude of the most recent one in 2012, will definitely tamper with food security of the nation. Researchers and reports have shown the impacts on agriculture and food security. NEMA 2012 and Aderogba 2012 showed that many farmlands have been washed off by the floods. Afolabi, 2013 reported that in Lafia, Nassarawa state, a \$90 million rice farm cultivated was inundated by the floods. Previous flood disasters also had similar impacts, washing away, farmlands and destroyed livestock, which is an integral part of agriculture in the north (Ibrahim et al., 2010).

3.0 METHODOLOGY

3.1 STUDY AREA (KOGI STATE)

Geographically, Kogi State is said to be the most centrally-located of all the states in the federation. It occupies a land mass of 29,833km² with 21 LGA's. Kogi State is located between latitude 6°30'N. and 8°50'N and longitude 5°51'E, and 8°00'E. The State is bordered by the following states; Enugu (South East), Benue (East), Nasarawa (North East); Niger (North), FCT (North); Kwara (North West), Ondo (South West); Edo (East), Anambra (South); and Ekiti (South West). With a total landmass of about 30,354.74km.sq, Kogi State is the 15th largest State in the country in terms of landmass (Babatimehin 2011). Kogi state has an average maximum temperature of 33.2°C and an average minimum temperature of 22.8%. Lokoja the State capital is generally hot throughout the year with an average humidity of 68 -70%. The State has two distinct weather- dry season (including harmattan) and wet season. While the dry season lasts from November to February, the rainy season lasts from March to October (7-8 months). Annual rainfall ranges from 1016mm in the driest parts of the State to 1524mm in the wettest parts. Average daily

sunshine in the State is 6.2 hours while average daily speed of wind is 89.9 kmph and average daily vapour pressure is 26hpg.

3.2 CONCEPTUAL DESIGN

The aim of this study is to assess the causes and impacts of flooding on agriculture and socio economic growth in study areas. This is a cross case study analysis based on secondary data alone. The cross case analysis evaluates all case studies used to seek linkages, differences, similarities and hopefully strategic solutions to the causes and impacts of yearly flood events in Nigeria. The literature review describes the events of flooding, linking it to climate change and its effect on agriculture. Emphasis is made on impacts on agriculture and food supply. This is because agriculture is the major source of livelihood for 70% of Nigerians (mostly in the northern states) and agriculture is heavily dependent on rainfall. Therefore it shows how any impact on agriculture affects millions of northern Nigerians which depend on the income from farm produce to survive. The assessment was done primarily on the people directly affected by the past flooding disasters in northern Nigeria.

3.3 CROSS CASE ANALYSIS TECHNIQUE

This research is a cross-case analysis of two case studies of flood prone regions in northern Nigeria. The selected sites have all been categorized as group A of the four federal government aid groups due to the impact of the 2012 floods. Group A were considered a priority because it had the largest number of victims displaced. The case studies examine the causes of flooding in the area and impact on agriculture, environment and socio economic development. The two case studies were selected for several reasons. All experience annual floods leading to loss of lives and properties, the major trade is agriculture (farming, fishing, cattle breeding), they all suffered severe losses and were the worst hit in 2012 floods and all case studies play a vital role in the economic growth of the country and food production. The sites selected also vary as one is a proper urban community and the other a rural community. This is done to see the similarities and differences in urban floods and rural floods.

4.0 CASE STUDY DISCUSSION

Kogi State is called the 'confluence state' because the two major Nigerian rivers (River Benue and River Niger) meet in Lokoja the state's capital. Historically, the name 'Nigeria' started in Kogi state when it was the capital of northern Nigeria during the reign of Lord Lugard as high commissioner in 1900. Due to its location as the collection point of the two rivers, and heavy settlement in the areas by the water, most communities and farmlands are submerged annually during the rainy seasons when the river banks rises and spills over to land. The 2012 flood however took a more severe toll on the state and country at large. Kogi state was hit the worst affecting about 70% of the population and displacing close to 2 million of the state's 3 million people (NEMA, 2012). 332 communities in total were washed away completely among which are Lokoja (the state capital) and Ibaji local government area washing away homes, farm lands, animals, cars, and major roads etc.

4.1.1 Lokoja

Lokoja is the capital of Kogi state and on the fast rise in population and economic growth and development. It is an urban area occupying a land mass of 3,180km² and a population of 196, 643. It is located right by the confluence point therefore making it a trade centre for agricultural activities which is the main trade of the area. However, being an urban area and seat of the state government, it has attracted other activities in developmental growth such as industries, white collar jobs, businesses and institutions (Aderogba 2012). Like most riverine areas in Nigeria, Lokoja deals with flooding annually, but like the entire nation, the intensity of the 2012 floods was not expected. However, warnings were issued to the state by NEMA (National Emergency Management Agency) after they (NEMA) received warnings from the Cameroon government about the release of Lagdo dam into the Benue River (Ijeoma 2012). The communities were subsequently issued with the same warning to migrate to safe regions but all to no avail, some were worried about leaving their entire source of livelihood behind and many generally had nowhere else to go.

The flood in Lokoja was exacerbated by the location of the town on the confluence of the Rivers Niger and Benue whose water levels had risen to unprecedented level. The River has thus; submerged several villages, washed away farm lands. Roads were inundated and automatically disrupted the socio-economic activities of the state, particularly the inundation of some sections of the Lokoja-Abuja and Lokoja-Ganaga highways by the flood waters, effectively cutting off the major highway which links the northern and southern parts of the country. NEMA 2012 reported that a total of 10 communities in lokoja were totally submerged and the federal and state government had to put up 7 refugee camps to house the displaced individuals temporarily.

4.1.2 Ibaji

Ibaji is a local government area in Kogi state considered as a 'farming and fishing' community and also frequently has to deal with the menace of flooding annually. In 2012 about 80% of its grounds were submerged by floods (NEMA 2012). The frenzy and chaos among indigenes was heard all over the nation as they cried for lost properties and lives and begged the government and good willing Nigerians to come to their aid. NEMA 2012 reported that twenty two (22) temporary shelters were put up across the area to help villagers who have lost everything. A few pregnant women were said to have given birth in the camps and 2 villagers committed suicide, and the camps were so crowded and the food supplied wasn't enough. Massive destruction of farms, homes, hospitals and schools were recorded and day to day activities were put on hold. The government however, did their best to camp and feed the internally displaced victims.

4.2 PRINCIPAL FINDINGS AND DISCUSSION

Critically based on data from the literature review and careful cross-case analysis from the case studies, a number of findings were realized relating to the causes of the recurrent flooding and the resulting loss of lives and properties. Although it may not be possible to generalise based on the two case studies, the similarities and trends may reveal the underlying issues in hope to build a more strategic approach to the annual events of flooding. Like Curtis & Mills (2010), I agree that natural events such as flooding have patterns and trends as they occur which has been triggered by people, cultures and economic development.

The key findings realized from the cross-case analysis are:

- ❖ Climate change is the major cause of floods creating increase in intensity of rainfall which leads to the release or bursting of dams.
- ❖ Poor management and construction of settlements by the floodplains
- ❖ The need for climate justice to be introduced into any flood control and prevention scheme.
- ❖ Law enforcement agencies, flood prevention & control policies and land development policies poorly implemented.
- ❖ Agriculture and food security at risk as thousands of hectares of farm lands are being washed away
- ❖ Indigenes failure to adhere to warning signs of flooding prior to release of Lagdo dam.

Having assessed the findings and literature review on impact of climate change on livelihood, agriculture and vulnerability, it was clear that climate change is indeed occurring and the changes are happening fast and on a rapid increase both in terms of extreme weather frequency and gradual changes in land degradation in Nigeria. Climate change is a global situation every nation has to be educated about, controlled and be prepared for. It is caused by both natural and man-made factors. Regardless of the cause, we have seen the impact of climate change over the years which have had an unpleasant effect on nations and communities affected. This is because it interferes with the social, economic and environmental well-being of the people. The major causes of floods over the years and especially in 2012 has been identified as climate change which caused an unpredictable heavy downpour of rains which filled up the reservoirs and rivers. The study shows that although climate change is a factor experienced globally, it is a natural factor but the impact and degree of damage is as a result of man-made interference through exploitation of resources and other forms of socio-economic development.

Settlements and construction of buildings along floodplain is the most common cause of floods in urban areas like Lokoja from the case studies. Conversely, in the rural communities, due to poverty the buildings are constructed poorly and wash away easily even with simple flash floods. Looking at the goals and principles of the 1999 National policy on environment-Flood and Erosion control, the urban and regional development policy and land use act and also looking at the case studies seeing that most of the victims dwelled by the river plains shows that the UNHABITAT 1995 definition of land use planning hasn't been put to practice. Land use planning is when an area of flood control is dedicated to meeting human and settlement needs while at the same time reducing the risk of flood disaster and vulnerability of people, crops, infrastructure settlements and key structures to flood loss and flood damage. However, in all fairness there is also resistance from settlers even after being warned and being victims. There seems to be some sentimental attachment amongst dwellers as they refuse to migrate claiming it's the land of their ancestors and they can't leave.

The vulnerability and threshold level of the flood disasters is not uniform and the some people suffer a great deal more than others which are usually very poor communities with poor adaptation techniques. The literature review shows that like most disasters the poor communities are hit the most and within this group, women, children and the elderly suffer more. These vulnerable groups are those who live in risk areas like the plains, and others are relatively poor they can only afford to live in mud/straw houses which gets washed away when the floods come. The failure of the local and state governments to provide adequate housing and infrastructures for individuals is the cause and bad planning and implementation of urban development. The policy makers ought to therefore claim responsibility and integrate Climate Justice in the schemes. Climate Justice is a fairly new vision which seeks to bring fairness, equality and environmental justice especially since the most vulnerable of the effects of climate change are those who are least involved in activities that cause it. Climate Justice is recognizing that the urgent action needed to prevent climate change must be based on community-led solutions and the well-being of local communities, Indigenous Peoples and the global poor, as well as biodiversity and intact ecosystems. Climate justice is the understanding that we will not be able to stop climate change if we don't change the neo-liberal, corporate-based economy which stops us from achieving sustainable societies. It is the understanding that corporate globalization must be stopped.

One of the interesting findings from the study was that there are several laws, policies, frameworks, adaptation strategies, flood, prevention and control schemes available for both federal and state level yet yearly the countries experiences disastrous floods washing away properties worth Millions of US dollars. Adesina 2011 reported in This Day News that not adequately addressing Climate Change will cost Nigeria N1.4 trillion annually. That is an alarming figure that can be invested in prevention and reduction of the impacts of climate change and flooding to a minimal level. The interesting question is if the nation has all these policies yet face these increasing threats on flooding yearly, what then is the problem? Maybe they don't relate to Nigeria, not of standard quality or that they are just poorly implemented? I go for poorly implemented. I believe that laws and law abiding citizens are the backbone of a standard development growth in any community or nation. Having the laws is however not the problem here but implementing and enforcing them. People feel they can get away with anything because there are no binding laws or punishment for breaking them. Enforcement agencies need not just to have these laws, acts and codes of conducts but also to implement them at every level (federal and local) for the interest of lives and wellbeing of the people and also for sustainable development.

5.0 CONCLUSION

This study shows that there is an increasing trend of climate change which aggravates the occurrence of extreme weather events such as flooding and its impact on livelihood on northern Nigeria, who are predominantly farmers will put at economic growth at stake. The impact on socio-economic activities automatically affects the nation's stability and economic growth. The monumental loss, followed by government's efforts in donations and recovery of losses all slows down economic activities, including crude oil production and transfer as seen in the literature. Inappropriate development of infrastructures by floods plains is obviously an issue especially since its one of the priorities of the flood control policy. The degree of impact shows weak communication and bilateral co-operation between Nigeria and neighboring countries particularly Cameroon in regards to management of waters. The findings show weakness in environmental impact assessment, vulnerability maps and negligence. The negligence is not only on the part of authorities alone but also of the people who were warned about the floods but refused to adhere to the warning. An intervention needs to be made to address these issues and mitigate the effects of future floods to secure lives and properties and to sustain our economic growth in a sustainable way.

6.0 RECOMMENDATION

The following recommendations are advised based on the findings, literature review and conclusions made in this study.

1. The Nigerian Government should draw up a more comprehensive flood control/prevention plan, paying particular attention to prone areas and integrated into master plans for all cities, local government and villages.
2. All existing planning laws in each state should be reviewed to meet present day realities and a building code for the state, be provided for enforcement.

3. Climate justice should be adapted at every level so there is equality in policy implementation. Climate Justice is a fairly new vision which seeks to bring fairness, equality and environmental justice especially since the most vulnerable of the effects of climate change are those who are least involved in activities that cause it.

4. Ministries such as Ministry of Works and Housing, Ministry of Environment, Ministry of water resources and the State Ministry of Land Housing and Urban & Rural Development should work together in drawing up plans and strategies and if possible to come up with a single policy for rural development and another for urban development.

5. Public enlightenment should be emphasized on the dangers associated with erecting buildings on flood prone areas and other practices that will affect the environment and create risk to individuals. Climate change lectures should be given to farmers, community members, talks on radio, and primary school will help in enlightening people on the risk and consequently their compliance with policies and future warnings. .

6. Emergency action plans should be put in place for unforeseen future events, even if it seems insignificant. The common sayings 'Prevention is better than cure' and 'Better safe than sorry' can be used as phrases for strategic planning.

REFERENCE

Action Aid (2006): Climate change, urban flooding and the rights of the urban poor in Africa. A report by Action Aid International

Adelekan, I. O (2009): Vulnerability of Poor Urban Coastal Communities To Climate Change In Lagos, Nigeria. *Fifth Urban Research Symposium* 2009. [pdf]

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* June 2012, Vol. 1, No. 3 ISSN: 2226-3624

Adesina, A., (2011): THISDAY NEWS. How can Nigeria Make Agriculture Blossom. 4th December 2011. Accessed online on the 4th of December 2013 via <http://www.thisdaylive.com/articles/how-nigeria-can-make-agriculture-blossom/104218/>

Afolabi, B., (2013): Nigeria made \$900M from cocoa export in 2012, says Aganga. Accessed online on the 20th of March 2014 via www.thenationonline.net/new/news/nigeria-made-900m-from-cocoa-export-in-2012-says-aganga/

Agwu, J., and Okhimamhe, A., (2009): 'Gender And Climate Change In Nigeria': A Study Of Four Communities In North-Central And South-Eastern Nigeria. ISBN: 978 - 978 – 904 – 502 – 0. Copyright ©Heinrich Böll Stiftung (HBS), 2009.

Apata TG, Ogunyinka A, Sanusi RA and Ogunwande S (2010): Effects of global climate change on Nigerian Agriculture: An empirical analysis. Paper presented at the 84th annual conference of Agricultural Economics Society held Edinburgh, Scotland, pp 345-351

Bariweni, P. A., Tawari, C.C. and Abowei, J.F.N., (2012) Some Environmental Effects of Flooding in the Niger Delta Region of Nigeria. *International Journal of Fisheries and Aquatic Sciences* 1(1): 35-46, 2012 ISSN: 2049-8411; e-ISSN: 2049-842X © Maxwell Scientific Organization, 2012. [pdf]

Bello, O. B., Ganiyu, O. T., Wahab, M. K. A., Afolabi, M. S., Oluleye, F., Ig S. A., Mahmud, J., Azeez, M. A. and Abdulmalik, S. Y., (2012) 'Evidence of Climate Change Impacts on Agriculture and Food Security in Nigeria' *International Journal of Agriculture and Forestry* 2012, 2(2): 49-55 DOI: 10.5923/j.ijaf.20120202.08.

BNRCC, (2011): *Reports of Pilot Projects in Community-Based Adaptation- Climate Change in Nigeria*. A compendium of Reports commissioned by Building Nigeria's Response to Climate Change (BNRCC) Project. Ibadan: Nest

Bronstert, A., (2003): 'Floods and Climate Change: Interactions and Impacts'. *Risk Analysis*, Vol. 23, No. 3. 2003. [pdf]

Curtis A, and Mills J.W (2012): Spatial Video Data Collection in a Post-Disaster Landscape. *Journal of applied Geography* 32(2)393-400

Dell M, Benjamin F.Y and Benjamin A.O (2008): Climate Change and Economic Growth. Evidence from the last Century. NBER Working Paper, 14132, Cambridge MA.

Dimelu, M. U., Agbo, C. and Igbokwe, E. M., (2011) ' Pattern Of Alcohol Consumption And Its Effects On Livelihood In Selected Rural Communities Of Enugu State, Nigeria ' *Asian Journal of Agriculture and Rural Development*, Vol.1, No.2,pp.69-79

Etuonovbe, A.K., (2011): The Devastating Effect of Flooding in Nigeria. *Hydrography and the Environment*. Accessed online on the 16th of June 2014 via: http://www.fig.net/pub/fig2011/papers/ts06j/ts06j_etuonovbe_5002.pdf

Farauta, B. K., Egbule, C. L., Agwu, A. E., Idrisa, Y. L. And Onyekuru, N. A., (2012): 'Farmers' Adaptation Initiatives to the Impact of Climate Change on Agriculture in Northern Nigeria' *Journal of Agricultural Extension* Vol. 16 (1), June 2012.

Federal Ministry of Environment, (2004): Abuja. Accessed online on the 29th of January 2013 via www.nigeria.com.ngcichng.org/ccinfo.php

Ibrahim, M. K., David, A. M. and Okpanachi, G.U., (2010): 'Climate Change, Agriculture and Food Management In Nigeria' *Journal of Environmental Issues and Agriculture in Developing Countries* Volume 2 Numbers 2 & 3, 2010.

International Fund for Agricultural Development (IFAD), (2011): *Rural poverty in Nigeria*. Accessed online on the 4th of March 2015 via: <http://www.ruralpovertyportal.org/web/guest/country/home/tags/nigeria>

Ijeoma, S., (2012): Nigeria & Climate Change Adaptation. *International Society of Sustainability Professionals*. ISSP Insights, May 2011. Accessed online on the 20th of January 2015 via: <http://www.sustainabilityprofessionals.org/nigeria-climate-change-adaptation>

IPPC, (2007): *Climate Change 2007: Synthesis Report*. Accessed online on the 5th of January 2015 via: http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf

Jake W and Joe B (1999): Sustainable Development; Fact Sheet Series for Key Stage 4 and A-Level. Accessed online on the 12th of July 2014 via http://www.kentair.org/document/st4_Sustainable_Development.pdf

Jones, P. and Thornton, P., (2003): 'The potential impacts of climate change on maize production in Africa and Latin America in 2055'. *Global Environmental Change* 13 (2003) 51–59.

Lobell, D. and Burke, M., (2010): Climate Effects on Food Security: An Overview. *Advances in Global Change Research* 37, DOI 10.1007/978-90-481-2953-9_2, © Springer Science+Business Media, B.V. 20 0 Accessed online on the 5th of January 2015 via: http://www.ocf.berkeley.edu/~marshall/papers/Chap2_overview.pdf

Maslin, M., (2004): *GLOBAL WARMING: A very short introduction*. 2nd Edition. Oxford: Oxford University Press.

Medugu, N., (2009): *Combating Climate Change in Nigeria*. Accessed online on the 30th of December 2014 via <http://environmentalsynergy.wordpress.com/2009/08/14/combating-climate-change-in-nigeria/>

National Aeronautics and Space Agency (NASA), (2011): 'Flooding in Nigeria'. <http://visibleearth.nasa.gov/view.php?id=51907>

National Academy of Science (2008): Understanding and Responding to Climate Change: Highlights of National Academies Reports 2008 Edition. Accessed on the 20th May 2014 via www.national-academies.org

NASPAN-CCN, (2011): *National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN)*. Federal Ministry of Environment, Special Climate Change Unit. [pdf] Electronic version: ISBN 978-0-9878656-5-6

National Emergency Management Agency (NEMA), (2012): *Flood: more than 25, 000 displaced in Benue as many communities remain adamant*. Accessed online on the 10th of December 2015 via <http://www.nema.gov.ng/emergency-zones/floods.aspx>

Nigeria First Communication Commission (NFNC) (2003): under the United Nations Framework Convention on Climate Change. Federal republic of Nigeria pp: 1-132.

Nigerian National Petroleum Corporation, NNPC, (2012): Oil Production. Accessed online on the 6th of May 2015 via: <http://www.nnpcgroup.com/NNPCBusiness/UpstreamVentures/OilProduction.aspx>

Nzeh, E.C., Eboh, R.O., Eboh, E., Nweze, N., Nzeh, C., Orebiyi, J. and Lemchi, J., (2012): Climate Change Adaptation In Nigeria And Its Challenges In Agricultural Sector: Empirical Information. *Academia.edu. Share research*. Accessed online on the 10th of October 2014 via http://www.academia.edu/1200946/CLIMATE_CHANGE_ADAPTATION_IN_NIGERIA_AND_ITS_CHALLENGES_IN

Obioha, E.E., (2009): Climate Variability, Environment Change and Food Security Nexus in Nigeria. *J Hum Ecol*, 26(2): 107-121 (2009). Accessed online on the 3rd of November 2014 via <http://www.krepublishers.com/02-Journals/JHE/JHE-26-0-000-09-Web/JHE-26-2-000-09-Abst-PDF/JHE-26-2-107-09-1846-Obioha-E-E/JHE-26-2-107-09-1846-Obioha-E-E-Tt.pdf>

Odjugo, P., (2010) 'Regional evidence of climate change in Nigeria' *Journal of Geography and Regional Planning* Vol. 3(6), pp. 142-150, June 2010. Accessed online on the 10th of March 2015 via <http://www.academicjournals.org/JGRP>

Olanrewaju D.O and Fadairo G (2003): Flooding as an Induced Environmental Problem. *Journal of the Nigerian Institute of Town Planners XVI (1)*85-95