



UNIMAID JOURNAL OF PRIVATE AND PROPERTY LAW

Vol. 6, No.1, 2021

ISSN: 2534-6181



ENVIRONMENTAL LAW RISK MANAGEMENT;
A REMEDIAL RESPONSE TO FLOODING AND WIND EROSION

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ABSTRACT

Environmental risk simply refers to the disasters which affect lives and properties within environment as a result of the action of man and other natural phenomenon. Environmental risks in Nigeria are of different types ranging from pollution, Ozone layer depletion, land degradation, flooding, global warming, deforestation, soil erosion and atmospheric contamination. These problems are classified as natural, developmental and socio-economic. This research reflects on critical issues relating to flooding in Nigeria such as causes, impacts and remedies. On this parance, an evaluation is done on environmental risk management as a remedy to curtailing flooding and wind erosion menace in Nigeria. Flooding and wind erosion which adversely have been more damaging in Nigeria have worsened recently due to a number of factors such as rapid population growth, urbanization, poor urban planning and climate change especially in increased frequency and intensity of rainfall. There is limited effort in tackling this flood hazard due to lack of flood data and other remote causes yet to be identified. The rate of flooding occurrence recent time is alarming. Globally, millions of people are exposed to flooding and wind erosion every year with recorded cases of death, lost of buildings, in some cases communities were rendered homeless and other hazards. This research, through doctrinal legal research technique, has reveals various strategies of environmental risk management which include risk avoidance, risk retention, risk transfer, risk reduction, diversification, opening of contingency fund, insurance management and establishment of risk management and establishment of risk management monitoring team. These options are reviewed and recommended as mitigating factors to flooding and wind erosion menace in Nigeria.

KEYWORDS: flood, erosion, hazards, risk

1. INTRODUCTION

The hazards being generated from human activities in the environment have constituted a major concern to world leaders especially in the industrialized Nations of Western World. Over the periods, 1985 to 2014, flooding in Nigeria had affected more than 11 million lives with a total of 1100 death and property damage. Lagos State had experienced most of the floods while more frequent floods are recorded in Niger, Adamawa, Oyo, Kano and Jigawa States possibly due to the influence of Rivers Niger, Benue, Ogun and Hadeja.¹ Arguably, the rate of flooding and wind erosion occurrence in recent times has been unprecedented especially in Oyo State Benue State, Imo State, Lagos State, Edo State, River State and others where a lot of lives were rendered homeless.

In Nigeria, addressing challenges of flooding and wind erosion are critical issues. Eventually, the Country has experienced devastating floods which affected millions of people and caused fiscal

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¹ Nkwenmwo U.C, Malcolm W, Brain B, Flooding and Flood Redaction in Nigeria: cardinal Gaps, 5 University of Nigeria, Enugu J. Geogr Nat Disast, 2015 P. 1

losses amounting to billions of us dollars.² These hazards were generally linked to poor urban planning and climate change especially in increased frequency and intensity of rainfall.³ In our environment, a lot of activities take place on daily basis such as road construction, oil exploration, deforestation, mining, quarrying, farming and other industrial activities. These activities have constituted a lot of environmental risks to man and other living things in their environment. Such risks include flooding, land degradation, pollution, global warming, Ozone layer depletion, soil erosion and atmospheric contamination resulting to accident, death, sickness and financial loss. However, this research focuses only on the risk of flooding and wind erosion. An evaluation is carried out on the various strategies of environmental risk management with the sole aim of reducing flooding and wind erosion hazards in Nigeria.

On this premise, some factors have been identified as contributory factors enhancing flooding and wind erosion in Nigeria. Again, this research also recommends possible ways of reducing flooding and wind erosion as well as its attendant risks or hazards. All these are discussed hereinafter. However, before such discussion, we venture to look at the legal mandate of some of the various law enforcement Agencies saddled with the responsibilities of controlling flooding and wind erosion in Nigerian environment. Among these are; National Emergency Management Agency (NEMA), Nigeria Hydrological Services Agency (NIHSA), Nigerian Meteorological Agency (NIMET) and National Environmental Standards and Regulations Enforcement Agency (NESREA).

2. THE LEGAL MANDATE OF THE ENFORCEMENT AGENCIES

A. National Emergency Management Agency (NEMA)

The National Emergency Management Agency hereinafter referred to as NEMA was established via Act 12 as amended by Act 50 of 1999 to manage disaster in Nigeria.

NEMA was established to tackle disaster related issues through the establishment of concrete structures. Its mission is to coordinate resource towards efficient and effective disaster prevention, preparation, mitigation and response in Nigeria.

As part of its legal mandate, the Act vested the authority of managing disaster in Nigeria on NEMA. According to the enabling law, NEMA shall among other things formulate policies on all activities relating to the disaster management in Nigeria and coordinate the plans and programmes for efficient and effect response to disasters at national level. It has a duty to ensure prompt and efficient response to disasters. NEMA establishes warehouses in its six zonal offices and Abuja and stock them with relief and rehabilitation items. This is to ensure prompt intervention in response to flooding and wind erosion in Nigeria.

B. Nigeria Hydrological Services Agency (NIHSA)

The Nigeria Hydrological Services Agency hereinafter referred to as NIHSA was established by the establishment Act of 2010.

The Agency is charged with the responsibilities of providing, among other things, all forms of hydrological services in Nigeria and for related matters contained in the Act⁴, such as:

- I. Advise the Federal and States Government on all aspect of hydrology;
- II. Work with the meteorological services to issue forecasts for floods.
- III. Provide hydrological services in operational hydrology and water resources activities;
- IV. Collect, process and disseminate all hydrological data and information within and outside Nigeria.

² NEMA (Nigerian Emergency Management Agency); Report on Flood Disasters in Nigeria; Abuja-Nigeria: Government Press, 2013.

³ Adeloje A.J; Rastam R; Flooding and Influence of Urban Planning: Urban Design and planning, Lagos-Nigeria, 2011, Pp. 175-187

⁴ Part II section 7(1) of the establishment Act of 2010

- V. Carry out geo-physical investigations for citing ground water development projects dam foundation and saline water intrusion.

Sub-section (2) provides that without prejudice to the functions in sub-section (1) of this section, the Agency shall where it is required, prescribed the hydrological requirements for all sectional activities including environmental water way transportation, natural disaster and relief management issues.

C. Nigerian Meteorological Agency (NIMET)

The Agency was established for the purpose of studying the atmospheric conditions for weather forecasting. The Agency Legal Directorate was created under section II of the Nigerian Meteorological Agency Establishment Act, 2003. Its legal mandate is to render services in accordance with international best practices and to ensure that the set goals and purpose of establishing the Agency are achieved in line with the established rules, conventions and laws.

D. National Environmental Standards And Regulations Enforcement Agency (NESREA)

NESREA Act was enacted by the National Assembly of the Federal Republic of Nigeria.⁵ NESREA was created by the NESREA Act as a major Federal body charged with the protection of Nigeria's environment. The Federal Government, in line with the provision of the constitution⁶, established the Agency as an institution under the supervision of the Federal Ministry of Environment, Housing and Urban Development. NESREA was created to replace the defunct Federal Environmental Protection Agency hereinafter referred to as FEPA.

NESREA as a body corporate with perpetual succession and a common seal, may sue and be sued in its corporate name.⁷ It is responsible for the enforcement of environmental standards, regulations, rules, laws, policies and guidelines. Its authority extends to the enforcement of environmental guidelines and policies, such as the National Policy on the Environment, 1999.

This is indicative of the importance and relevance of standards, rules, policies and guidelines on the environment. Although they may not have the force of law, they are a vital and necessary element in the protection and preservation of the environment. The Agency is charged with responsibility for the protection and development of the environment, biodiversity conservation and sustainable development of Nigeria's natural resources as well as environmental technology.

FACTORS ENHANCING FLOOD AND WIND EROSION

Some factors have been identified as factors enhancing the risk of flooding and wind erosion in Nigeria. These factors need to be tackled in order to mitigate flood and erosion hazards. The fundamental idea of flood risk reduction is to build the resilience of human population to flooding.⁸ In the US, UK and Netherland, it can be argued that this idea is underpinned by much profound measures for tackling flooding. In Nigeria, there are potential efforts for flood and wind erosion risks management but in the light of best practices of risk management, there are notable flaws. These factors are referred to as the gaps and limitations.⁹

A. Poor Attention to Flood Modelling and Assessment of Vulnerability to Flooding

Flooding in Nigeria which dates back to the early 1950s are fluvial, coastal and pluvial in nature and have been a major cause of concern for rural areas and cities within the country.¹⁰ Fluvial and coastal flooding both of which affected mainly coastal environments are influenced by seasonal

⁵ Established on the 30th of July 2007

⁶ section 20 of the Constitution of the Federal Republic of Nigeria, 1999.

⁷ Section 1 (2), NESREA Act, 2007

⁸ <http://www.unisdr.org/files/657-lwr1.pdf>

⁹ Nkwunonwo U.C, Malcolm W. and Brain B., Flooding and Flood Reduction in Nigeria: Cardinal Gaps. 5 University of Nigeria, Enugu J. Geogr Nat Disast, 2015 P. 7

¹⁰ Bashir O., Oludare H. And Aloysius B., Floods of Fury in Nigerian Cities Vol. 5: Nigeria, Journal of Sustainable Development, 2012, Pp. 69-79.

Douglas I., Alam K., Magherda M., McDonnell, Y. And Melcas L; Unjust Waters: Climate Change, Flooding And The Urban Poor in Africa; Environment And Urbanization Vo. 20, 2008. Pp. 187-2005.

interruption of major rivers and water overtopping their natural and artificial defences and overflowing areas not submerged.¹¹ Fluvial floods and wind erosion account for the majority of the flood threats experienced in locations along the plains adjoining major rivers in the country, including rivers Nigeria, Benue and Hadeja. The States in Nigeria mostly affected by such floods are Adamawa, Kano, Nigeria, Jigawa, Kaduna, Cross River and Kebbi.¹² In 2006, the worst fluvial flood in Nigeria was the Kaduna flood disaster which affected hundreds of thousands of human lives with economic loss worth millions of US dollars.¹³

Costal floods in Nigeria affect the low-lying areas in the Southern part of the Country comprising for example Rivers, Bayelsa, Akwa Ibom and Delta States. The Impacts of such floods have been severe due to the number of human populations exposed following the attractions of coastal areas for economic and social reasons.¹⁴ Today, flooding risk is growing worse and worse in the various states of Nigeria. Nigeria is globally ranked with the top 20 Countries whose present population and future sceneries including climate change and socio-economic factors are exposed to coastal flooding.¹⁵

Following the recent occurrences of flooding and wind erosion in some States of Nigeria, the realization is that flooding hazard in this Country is alarming. In Port-Harcourt in River State a lot of families, churches and offices were displaced as a result of flood that occurred. Vehicles at Federal Road Safety Commission Offices in Mile one in Port Harcourt Submerged in flood.¹⁶

In Delta State, over 500 students of Government College at Bomadi in Bomadi Local Council of Delta State were displaced by a raging floodwater from River Niger which has overflowed its bank. Public and private schools in Delta had resumed for the 2017/2018 academic session on Monday September 11th 2017 but the floodwater submerged the school compound to about four feet deep. Even the access road to the school and neighbouring buildings were affected. Expectedly, students were warming up to resume their classes after the assembly when suddenly the overflowing water from River Nigeria overwhelmed them.

Furthermore, it was reported to Journalists by a community leader and former member of the Post Primary Education Board (PPED) that the flood has threatened the entire community adding that their children were no longer safe to attend classes. While expressing fears of the unknown, especially the fear that the school might remain closed until the water recede. Investigation revealed that houses within the River Niger bank have been completely submerged when the river started overflowing its bank although no life was lost, farm crops within Oko and Head Bridge were destroyed.¹⁷

Pluvial floods usually occur annually during rainy seasons between July and October and affect mainly the urban areas in Nigeria. Such floods which are arguably unprecedented in recent times are caused by more frequent and severe rainfall which overwhelms the efficiency of drainage

¹¹ Akintola E.; *Flooding Phenomenon*, Ibadan Rex Charles Publication, 1994. Pp. 244-255

¹² Ilaje N.P A New geography of Nigeria, Lagos, Longman Publishers, 2004

Agbola B.S; et al; *The August 2011 Flood in Ibadan, Nigeria; Anthropogenic Causes and Consequences.*

International Journal of Disaster Risk Science, Vol. 3, 2012 Pp. 207-217.

¹³ Adebayo A.A and Oruonye E.D; *An Assessment of the Effects of the 2012 Floods in Tamba State, Nigeria* Paper delivered at the Annual National Conference Organized by the Association of Hydrological Science at University of Agriculture, Abeokuta, Ogun State Nigeria, 2013. Pp 13-18.

¹⁴ Adelekan O. *Vulnerability of Poor Urban Coastal Communities to Flooding in Lagos, Nigeria*, *Environmental and Urbanisation* Vol. 22, 2010. Pp. 433-450

¹⁵ Nicholls R., Hanson J.S et al. *Ranking of Port Cities with Higher Exposure and Vulnerabilities to Climate Extremes*. OECD Environment Working papers, No. 1 University of Southampton, United Kingdom, OECD Publishers, 2008.

¹⁶ Vanguard Publication, *Flood Sacks Homes, Churches in Rivers*, Monday July 24, 2017. Pp. 1, 5 & 40

¹⁷ The Guardia Publication, *Flood from Overflowing River Niger Sacks 500 Students in Delta*, Friday, September 15, 2017. P. 38

systems and soil infiltration capacity.¹⁸ That of the urban areas in the economic and political development of Nigeria is generally acknowledged, its enhancement however, is a critical anthropogenic influence on climate change and hydrological cycle in the Country given that much impervious surface, increase surface water runoffs and reduce soil infiltration capacity.¹⁹

With regards to control measures, the National Emergency Management Agency (NEMA) raised alarm over impending flood in Anambra, Abia, Delta and Bayelsa States. The warning was passed barely 24 hours after the Niger Basin Authority (NBA) released an alert on River Niger to the effect that further rise in water level in Niger republic would spread to Benin Republic, then Kainji Dam in Nigeria. Prior to the flood alert, major dams in the country including Shiroro, Kainji and Jebba had reportedly been full and spilling water.

THE NEMA Director General, during a stakeholders meeting on the flood situation had on the 13th of September 2017 in Abuja noted that Nigeria was facing an imminent disaster and there was the need for the State Governments to be prepared for any eventuality. According to him, about 27 states have been affected by flood while windstorm and rainstorm have affected 10 states in the Country adding that over 40, 161 people were displaced.

The Director General expressed regret that the State Emergency Management Agencies (SEMAs) lack adequate capacity and preparedness to address the disaster if it eventually happens. The Director of Engineering Hydrology, explained that the Niger Basin Authority issued the alert on September 7th, 2017 and it would take nine days for the water to come into Nigeria. It was pointed out that Abia, Anambra, Imo, Rivers and Bayelsa States are all part ways for River Niger to pass before it empties into the Atlantic Ocean.

On the Benuel, Rivers axis, the Director said that there was no cause for alarm yet as water was still being impounded in Lagdo Dam in Cameroon adding that if water was released from the dam, the entire Country would be engulfed in managing flood. He expressed regret that the country has only 200 dams which are not enough to dam all the rivers to curtail flood.

In china, there are more than, 1000 large earth dams. Ghana also have above 700 dams but Nigeria that is on the downstream of a larger river does not have adequate dams to checkmate flood.

The Director General of the Nigerian Meteorological Agency (NIMET), warned that there might be flash flood in Kebbi, Niger, Kwara, Kogi, Nasarawa, Plateau and the entire South-South and South-East States. He disclosed that there would be early cessation of rain in the far Northern States among others, warning that there would be extended rainfall in all the South-South and South-East regions.²⁰

Being as it were, the rapid population increase in many Nigerian cities is also a global concern within the context of flooding in urban area. It is estimated that more than half of the world's population has been residing in cities since the last 6 years and by 2030 the number of people living in urban areas of developing countries will grow to 5 billion, that is, 60% of the world's population.²¹ Regrettably, a major challenge with rapid population growth and urbanization in Nigeria which also seems to influence the risk of flooding in the Country both presently and in the

¹⁸ Houston D. Werritty A., Bassett D., Geddes A. And Hoolachan A., *Pluvial Rain-Related, Flooding in Urban Areas: The Inevitable Hazard*. York, UK, Joseph Rowntree Foundation, 2011.

¹⁹ Shuster W.D; Bonta J, et al; *Impacts of Impervious Surface on Watershed Hydrology; A Review*. Urban Water Journal Vol. 2. Pp. 263-275.

²⁰ The Guardian Publication, *Flood Disasters Loom in Bayelsa, Anambra Abia, Delta States-NEMA says 27 States Already Affected by Flood*. Vol.34, No. 14, 139, Thursday, September 14, 2017. Pp 1 & 6

²¹ Huong HLL, Pathimna A., *Urbanization and Climate Change Impacts on Future Urban Flood Risk in Can Tho City, Vietnam*, Hydrology and earth Systems Sciences Discussions, 8, 2011. Pp 10781-10824

United Nations World Population Prospects; The 2006 revision Executive Summary Department of Economic and Social Affairs Population Division, United Nations; New York, 2007.

future, if not addressed, has been poor urban planning particularly inadequate drainage system and the range of poorly serviced urban utilities.²²

Thus, it is pertinent to state the reality of wide spread flooding in Nigeria together with the mind-set of people carrying the notion that floods and wind erosion are inevitable phenomena which can never be fully curtailed within the natural environment appears to overwhelm efforts towards finding a solution.

The crucial gap in flood risk reduction in Nigeria is poor attention to flood modelling and assessment of vulnerability to flooding.²³ Flood data is fundamental to tackling flooding and wind erosion in Nigeria.

B. Weak Institutional Framework

The Nigeria's institutional approach to risk management of flood and wind erosion is intensely flawed. Most times the Institutional framework is geared towards response to victims of flooding and wind erosion instead of strategizing preventive measures.

Key roles within the approach has consisted of facilitating the emasculation of victims affected by floods and providing them with urgent humanitarian needs, the level of dissatisfaction and agitations from large numbers of the flood victims, especially the internally displaced persons question the effectiveness of institutional approach in Nigeria. This research reveals that the weakness of this institutional approach in Nigeria is a major contributory factor leading to more frequent flooding in the country. The Nigerian Meteorological Agency (NIMET), National Emergency Management Agency (NEMA), State Emergency Management Agencies (SEMAS) should restructure their legal framework towards preventing flood and wind erosion rather than the structural framework of responding to flood victims only. Thus, it is expected that each of the 36 States should have a SEMA but not all the States have Emergency Management Agencies backed by law. Other States are still clinging to the old Emergency Relief Agency or Ad hoc Emergency Management System. This alone without more is not satisfactory to the internally displaced persons. Sometimes even the relief materials given to mitigate the ugly situation are diverted from the victims who ought to be the beneficiaries. Thus, in Makurdi in Benue State, thousands of Internally Displaced Persons (IDPs) at the international market had on the 12th day of September, 2017 prevented the alleged diversion of relief materials by camp officials. According to the report,²⁴ the protest started when a truck, two Hilux vans, a bus and a saloon car loaded with relief materials from the camp warehouse were about to drive out of the camp.

The protesters overpowered the security guards at the camp and blocked the camp entrance to prevent the vehicles from moving out with the materials. The angry protesters reportedly accused camp officials of diverting the materials and abandoning them to die of hunger. Some of the internally displaced persons (IDPs) claimed they were not given any food items for three days. One of the IDPs, James Tarkende said;

When Governor Samuel Ortom and the Tor Tiv, Prof. James Ayatse, visited us they told us that nobody should divert materials out of the camp that is why we are protesting. In this camp only few people sleep on mattresses but we are not complaining. We are suffering but because of the situation at hand we understand with the Governor but the camp officials have gone too far this time. This is not the first time they are doing this, most times they do it in the night.

²² Olorunfemi F.B; *Managing Flood Disasters Under a Changing Climate Lessons from Nigeria and South Africa*. NISER Research Seminar Series, NISER, Ibadan-Nigeria, 2011.

²³ Nkwunonso U.C, Malcolm W, Brain B, *Flooding and Flood reduction in Nigeria: cardinal Gaps*. 5 University of Nigeria, Enugu J. Geogr Nat Disast, 2015 P. 1

²⁴ The Guardian Publication, *Benue IDPs Protest Against Diversion of Relief Materials*, Thursday, September 14; 2017 P. 12

The commissioner for Water Resources and Environment, Joseph Utsev said the State Government would investigate the incident. The Government had earlier removed the camp manager over allegations of irregularities.

Thus, the above can be likened to a case of corruption and lack of proper supervision by relevant Agencies. Corrupt practices among those appointed to administer relief materials in order to savage the bad situation of flood victims are now also making the situation to grow worse due to corruption.

Arguably, Institutional framework with a complex chain of action which characterizes Nigeria is not ideal for a country with urgent needs to address the threats of flooding. The widespread flooding in Nigeria requires less complex framework with reduced chain of action and increased authority and responsibilities towards flooding and ways of managing its threats as is the case in the United States, UK and Netherlands where a centralized authority such as FEMA, Environmental Agency (E.A) and Rijkswaterstaat respectively operates within the Institutional framework of institutional approach with more abundant resources towards addressing the challenges of flood risk.²⁵

The vulnerabilities of Local Communities to flooding in Nigeria may indicate among other factors an overwhelming level of irresponsibility towards flooding and ways of addressing its challenges.

C. Inadequate Funding

Most of the relevant Agencies are inadequately funded. According to Fagbemi²⁶ in NEMA, the amount allocated to Risk Reduction is insufficient to meet the demand of disaster risk reduction. Insufficient funding has negative impacts on NEMA's ability to implement risk reduction strategies. For example, inadequate funding is one of the reasons why NEMA has implemented vulnerability and capability analysis (VCA) in only 21 out of a total of 774 Local Government Areas and why many disaster risk reduction publications that were produced by emergency management agencies have not been translated into local languages. These publications contain valuable disaster-related information that would allow local people that do not speak English to understand their roles and responsibilities as well as measures they can adopt to reduce disaster risks in their localities. One reason for insufficient funding may be because the Federal Government does not see disaster risk reduction as a priority.²⁷

4. RISK MANAGEMENT STRATEGIES

Risk can be defined as a chance of loss or as chances of events having the possibility of occurring or not occurring. Environmental risk therefore means disasters that affect lives and properties within a particular environment which are caused by the activities of man and other natural occurrences.

According to Okonkwo, environmental risk management strategies are those techniques for managing environmental hazards or risks.²⁸

According to Mba, environment is the sum total of all conditions that surround man at any point in time on earth. Environmental risk management is the identification, evaluation and economic control of those risks that threatens lives and properties in an environment.²⁹

The different strategies for managing environmental risk are discussed as follows.³⁰

²⁵ Nkwunonwo U.C, Malcolm W. and Brain B., Flooding and Flood reduction in Nigeria: Cardinal Gaps, 5 University of Nigeria, Enugu J. Geogr Nat Disast, 2015 P. 7

²⁶ Fagbemi, Kayode; National Progress Report On The Implementation Of The Hyogo Framework For Action (2009-2011), Nigeria, Prevention Web, 2011. Accessed January 14th 2012.

²⁷ Fagbemi, Kayode; National Progress Report On The Implementation Of The Hyogo Framework For Action (2009-2011), Nigeria, Prevention Web, 2011. Accessed January 14th 2012.

²⁸ Okonkwo V. I., Introduction to Insurance; A Nigeria Perspective Hossana Publication. Enugu.

²⁹ Mba C; and Ogbuzi J. Urban Planning Perspective and Emerging Concepts. The Principles and Practice of Urban and regional Planning in Nigeria, Awka, Anambra State. Mekshink Publishers, 1979/1996.

³⁰ Sunday C.N; Strategies of Environmental Risk Mangement in Nigeria Global Advanced Research Journals, 3 (1) Ebonyi State University-Abakaliki 2014. Pp 011-015.

A. Risk avoidance

Simply means foregoing the activity associated with the risk and opting for the activity considered to result to minimal adverse effect. It is a transit and an extreme method of dealing with risk. It involves avoiding the event that could generate loss.

B. Risk Reduction

The term risk reduction refers to decreasing the chance of loss producing event and the size of the associated losses. The philosophy behind maintenance culture, Road Safety Corps, Police Force, Security Men, Proper Planning, environmental sanitation.³¹

C. Risk Retention

Risk retention refers to the situation where risk cannot be avoided such that the consequences of the risk are retained or assumed. Risk retention can be called risk assumption.

D. Risk Transfer

Risk transfer means shifting of the financial liability for loss, injury or damage to another person. In the world, insurance companies are the professional risk bearers. It involves passing on the burden or risk to another person who undertakes to bear them in accordance with the terms of the agreement.³²

E. Risk Diversification

This has to do with diversifying into many activities with the aim of offsetting losses from any activity by a compensation gain from the other activities. This strategy of handling risk sums up the facts about not putting your eggs in one basket.

5. DISASTER MANAGEMENT PROCESS³³

Disaster management involves many diverse activities.

These activities can be grouped into five main stages viz; Assessment, Mitigation, Preparedness, Response and Recovery. The first three activities are performed before the occurrence of disaster while the fourth and fifth take place during and after the occurrence of disasters respectively.

A. Assessment

This involves inventorying (identification and recording) the sensitivity and vulnerability of a region to ascertain types of hazards. At this stage, the levels of risks, the danger to human life, environment and structures are considered and determined. The assessment will provide identification of development that increase them, thus establishing the culture of prevention.

B. Mitigation

This entails making necessary provisions to ensure that the region is less vulnerable to known risks and danger. Mitigation activities may include; land use and planning, moving settlement away from areas susceptible to such risks and dangers such as flood and storm areas and the establishment and enforcement of building code.

C. Preparedness

This involves planning of emergency aid, development of scenarios and monitoring systems and establishment of early warning system, public information and awareness of likely hazards, community involvement in disaster management programmes, establishment of disaster management and reduction at local, State and National Levels and establishment of proper communication channels.

³¹ Nwite S.C, *Element of Insurance*, Immaculate Publications Ltd, 2005.

³² Okonkwo V. I., *Environmental Risk Management in Nigeria* Journal of Banking and Finance Ebonyi State University, 2 P. 1

³³ Augustine Chukwuma Emeribeofe, *Managing Flood Disasters In Nigerian Cities: Issues and Strategies Towards Meeting the Challenges in the Modern World-A Case Study of Owerri Metropolis Imo State, Nigeria (7587)* Sofia, Bulgaria, *From the Wisdom of the Ages to The Challenges of the Modern*, May 2015. Pp. 17-21

D. Response

This happens after the occurrence of the disaster which would have caused untold human suffering and damages to the environment. At this stage, rescue teams will attempt to save lives, injured people will be cured and nursed and reliefs will be supplied to traumatized survivors. This is the most sensational stage of disaster reduction and management system.

E. Recovery

This stage involves assessment of damages, rehabilitation, cleaning of the environment and social and economic reconstruction. It also entails the first three stages of disaster management process viz: assessment, mitigation and preparedness, all of which are central to strategic development aimed at preventing or minimizing the effect of future disasters.

6. LEGAL AND INSTITUTIONAL BASIS FOR CHECKING FLOOD AND FLOODING

Institutional approach towards addressing the threats of flooding in Nigeria dates back to the early 1960's with the establishment of federal and State Ministries of works.³⁴ However, the increasing frequency and severity of floods across the country prompted the establishing of the federal Environmental protection Agency (FEPA) as a unit in the Federal Ministry of Works and Housing in 1988,³⁵ and the federal Ministry of Environment (FME) in 1999. Among other things, the key roles of FME towards flooding risk management in Nigeria is to assess the flooding potentials as well as design, determine, develop and authorize the development of appropriate flood reduction measures for the country.³⁶

With the FME, Came various Ministries and Agencies for tackling flooding in Nigeria which include; Federal Emergency Management Agency (FEMA), National Emergency Management Agency (NEMA), State Emergency Management Agency (SEMA), Local Emergency Management Agency (LEMA), National Orientation Agency (NOA), National Commission for Refugees (NCR), National Environmental Standards and Regulations Enforcement Agency (NESREA) which by 2009, Nigerian Acts Supersede the FEPA, Nigerian Meteorological Agency (NIMET), Nigeria Hydrological Services Agency (NIHSA), Nigeria's Response to Climate Change (BN RCC).

NEMA is basically a coordinating body for disaster management in Nigeria Actions towards addressing the threats of flooding which the Agency coordinates include but not limited to policy formulation leasing halt and assessing the state of preparedness of all other relevant Agencies, data collation from relevant Agencies, education of the general public on flooding and interaction with SEMA towards the distribution of relief materials to disaster victims within states and Local Government Areas. Thus, on this premise, a memorandum of understanding was signed with NESREA and NOA to intensify efforts towards flood risk management in Nigeria.³⁷

The protection and development of the environment, risk management of flood and wind erosion is the key responsibility of NESREA, it is the Agency that enforces all environmental laws, guidelines, Policies, Standards and Regulations in Nigeria, as well as enforcing compliance with provisions of international agreements, Protocols, Conventions and treaties on the environment to which Nigeria is a signatory. Whilst the provision of humanitarian needs such as shelter, clothing and floods for internally displaced persons is anchored by the National Commission for refugees (NCR), the importance of Local Communities being aware of flooding and actively participating in discussions and decisions which might increase their resilience and adaptability to the hazard highlights is the role of National Orientation Agency which re-orientates and keeps Nigerians informed about ways of taking part in issue that affects them.

³⁴ Ibitoye M; The Need for Planning of Peri-Urban Growth in South Western Nigeria: The Surveyor's Perspective Symposium Organized by the Nigerian Institution of Surveyors (NIS) University of Lagos, Lagos State, Nigeria. 2007.

³⁵ Obeta M.C; Extreme River Flood Events in Nigeria: A Geographical Perspective of Nigerian Journal of Geography and the Environment Vol. 1; 2009. Pp 170-179.

³⁶ Federal Ministry of Environment (FME); Bulletin on Ecological Disasters, Abuja, Nigeria. 2012.

³⁷ Nigeria Emergency Management Agency-Report on Flood Disaster in Nigeria. Abuja-Nigeria, Government Press. 2013.

The poor perception of flooding in the country should be of a serious concern of this Agency. Issues relating to flood insurance are co-ordinated by Federal Emergency Management Agency (FEMA), the Agency makes Federally funded insurance protection policy available for property owners in Nigeria.

Policies relating to assisting flood victims at State and Local Government Levels are Co-ordinated by State Emergency Management Agency (SEMA) and Local Emergency management Agency (LEMA). As Climate change is complicit with other factors that influence flooding in Nigeria, Building Nigeria's Response to Climate Change's (BNRCC) key role is to collaborate with other agencies to promote the capacities of the generality of human populations within the Country to cope with all effects of Climate Change. Nigeria Environmental Study/Action Team (NEST) undertakes continuous research required for enhancing decisions and robust measures towards addressing flooding in Nigeria.³⁸

Some actions which characterize a cross section of Nigeria such as the failure to comply with environmental laws and regulations and to adhere to weather warnings and alerts are possible situations where lack of responsibilities of the general public is highlighted.³⁹

Thus twelve communities in Boki Local Government Area of Cross River were flooded following two days heavy rain while more than 3000 farm lands were equally destroyed. The incident which occurred were reported to have rendered hundreds of residents homeless as properties worth millions of naira were destroyed.

It is pertinent to recall that in Nigeria, flood and wind erosion has been occurring for many decades destroying properties communities and farmlands but no adequate remedy has been proffered especially by the various Agencies owing to the damages and loss being caused by flood and wind erosion every year, the Agencies need to review their risk management strategies by shifting from post-disaster reaction to pre-disaster response or reaction. Between July and October in the year 2012, flooding and wind erosion in Nigeria pushed rivers over their banks and submerged hundreds of thousands of acres of farmlands. By mid-October, the floods had already forced 1.3 million people from their homes and claimed 431 lives, according to Nigeria's National Emergency Management Agency (NEMA), Oguta Local Government Area and Ohaji/Egbema Local Government Area in Imo State were Among the areas that were affected by the said floods. It shattered both the built environment and the undeveloped areas.⁴⁰ Another area that was adversely affected by the 2012 flood is the Isoko ethnic group of Delta State in Nigeria. So many towns and villages in Isoko land were flooded whereby homes, offices, churches, market places and schools were displaced. Properties such as buildings and crops were destroyed as a result of the flood. Among the communities that were affected, to mention but few were, Ozoro, Olch, Uzere, Oyede, Ivrogbo, Emode, Igbide, Enwhe, Uro, Bethel etc.

7. CONCLUSION

The effect of environmental hazards cannot be over emphasized. Floods and wind erosion are among the most devastating natural disasters in the world today, claiming more lives and causing more property damage than anyone would imagine. In Nigeria, floods and wind erosion affect and displace more people than any other disaster and also cause a lot of hindrances to economic activities, damages to property such as buildings, economic crops and tress.

³⁸ Kolawole O.M; Olayemi A.B. and Ajayi K.T; *Managing Flood in Nigerian Cities: Risk Analysis and Adaptation Options-Ilorin City a Case Study*. Archives of Applied Science Research, 3:

³⁹ Aderogba K.; *Qualitative Studies of Recent Flood and Sustainable Growth and Development Cities and Towns in Nigeria*. International Journal of Academic Research in Economics and management Science, 1, 2012: Pp.11-25.

⁴⁰ Augustine Chukwuma Emeribeok., *Managing Flood Disasters In Nigerian Cities: Issues and Strategies Towards Meeting the Challenges in the Modern World-A Case Study of Owerri Metropolis Imo State, Nigeria (7587) Sofia, Bulgaria, From the Wisdom of the Ages to The Challenges of the Modern*, May 2015. Pp. 17-21.

We conclude in this research that environmental risk management is very important in any Nation especially in a developing Nation like Nigeria. It should be seen as a major remedial response to flooding and wind erosion menace in Nigeria.

8. RECOMMENDATIONS AND CONTRIBUTION TO KNOWLEDGE

The followings are recommended in this research:

- I. The Government of the Federation should provide more dams for all the Rivers, 200 dams only is not enough to curtail flood.
- II. The Government should also move people away from flood-prone areas and as well discourage people from building houses in flood-prone areas.
- III. Flood data is fundamental to tackling flooding and wind erosion in Nigeria.
- IV. Following the trend and the devastating nature of flood and wind erosion disaster in Nigeria, it is highly recommended in this research that the Government and its Agencies should shift their risk management strategies from post-disaster reaction or response in providing relief materials to flood victims to pre-disaster reaction in curtailing flood. This means that the Federal and State Governments will shift focus from relief materials distribution to flood and wind erosion disaster victims to prevention and mitigations.
- V. The ministry of information and orientation should develop an extensive public enlightments campaign or programmes to educate the public about flood and wind erosion risks or hazards.
- VI. Rivers channel should not be used as dumpsite for refuse disposal. Environmental Agencies such as National Environmental Standards and regulation Enforcement Agency (NESREA), National Emergency Management Agency (NEMA) and State Emergency Management Agency (SEMA) should all seat up in their responsibilities to the environment to ensure that structural development within the flood plain are stopped.