

Flood Insurance and Urban Flood Disaster Risk Management in Nigeria: A Study of Jalingo, Taraba State

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Abstract

Flood disaster is one of the world's greatest distractions. 'Flood insurance as a complementary strategy for urban flood disaster risk management in Nigeria: A study of Jalingo' reviewed relevant literature, examined interventions, mitigations and management of flood disasters in Nigeria. Lack of long term financial intermediation in its mitigation and management in Nigeria provides the lacuna which this study seeks to fill. Data were collected through questionnaire, oral interviews and from emergency management agencies in addition to the use of published and unpublished reports. Using descriptive and exploratory designs, it was found that flood disaster mitigation measures have been on short term alleviation rather than long term solutions. It was concluded that the measures have been inadequate. Flood insurance was examined and found to be a recommendable complementary strategy for the vulnerable urban dwellers. Sincere and vigorous political and financial commitments are also recommended for all emergency stakeholders.

Keywords: *Distractions, Flood-Insurance, Financial-Intermediation, Indemnifies, Restitution, Urban-Flood-Disasters*

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Background to the Study

Flood is one of the world's greatest natural disasters aggravated by man himself, especially in many developing countries (Olanrewaju, Chitakira, and Louw, 2019, Tingsanchali 2012). Like in many other affected countries, most flooding in Nigeria are known to be associated with vulnerable plains, troughs or water channels which are pressured by farming, pathways or settlements. Urban flooding have been attributed mostly to heavy rainfall, high floods, high tides (Huguet, 2018), and dam bursts such as the case of Lagdo Dam in Cameroon Republic. Such severe runoff water usually finds no way into the soil or into the rivers, thus aggravating the combined effects of blockage of drainage channels, improper land use like: farming, overcrowded settlements, deforestation, and other forms of pressure on city lands. Another cause of urban flooding in Nigeria is the meteorological climatic change resulting in sparse, or sparse but heavy rain falls which in turn cause excessive water flows on plains and rivers overflowing their banks (Tingsanchali, 2012). Such disasters have the history of severe damages in terms of losses of human and animal lives, population displacements, properties like agricultural lands, crops, utility facilities, public buildings and other infrastructure to mention but a few.

Thus, urban flood disasters in Nigeria, though an extreme menace, but are no longer surprising in its occurrences. What is not certain is how it will occur and who will be hit. Efficient mitigation and management measures starting with forecasting for early warning, construction of dams, river dikes or dredges, tree planting and resettlement of vulnerable communities have been hard to achieve in Nigeria. Flooding have severely affected Jalingo metropolis in 2005, 2012, 2014, similar in intensity to that of other state capitals like Makurdi, Lokoja, Minna, Port Harcourt, Abakelike and Benin City (Oluseppe, Iyalomhe, and Adekola, 2017). Efficient management of flood disasters and associated risk should not be devoid of many aspects like engineering, hydraulic, socio-economic environmental and financial intermediation if complete and sustainable lives in urban countries are to be guaranteed. Several studies carried out on flood disaster mitigation and management in Nigeria has come short of financial intermediation to complement the existing efforts. This lacuna in the study of flood disaster management in Nigeria triggered this inquiry into the management of flood and the feasibility of flood insurance for the vulnerable urban dwellers.

Flood disasters, an environmental menace, affecting Nigeria, have caused several epidemics such as water borne diseases like cholera and eventual loss of lives in addition to staggering naira valuable properties and internal trade. Thus the incessant flood disaster nightmare scenarios do aggravate the unemployment rates and therefore posing more budgetary burden on people and the governments. Nigeria's preparedness to tackle flood disaster has been described as reactive rather than proactive due to limited preventive and mitigating measures (Okoli, 2014, Olarenwaju, 2019). Hence, successes recorded in the management of flood disasters in Nigeria have largely been limited as issues of resettlement of flood victims and providing them with alternative sources of livelihood have been a mirage.

Objectives of the Study

This study reviewed papers on flood disasters, its management and mitigation in Nigeria. Specific objectives of the study include:

- i. Examination of urban flood disaster risk mitigation and management in Nigeria
- ii. Examination of flood insurance as a complementary strategy for urban flood disaster risk management in Nigeria.

Public enlightenment for effective prevention, mitigation and management of the metrological and climatic changes can prepare people, the government and non-governmental agencies against the perilous flood disaster presently limiting or diverting the course of development. This can be a good weapon for confronting the menace derailing progress of this country. Insurance can also be a viable Disaster Risk Reduction Strategy (DRRS). Induced flood insurance can therefore complement the existing flood disaster mitigation and management in Nigeria.

Several studies have been carried out on the prevention, causes, mitigation and management of flood disasters in Nigeria. However, most of them have focused on only the effectiveness and efficiency of the already practiced measures. This limitation constitutes a lacuna in the existing flood disaster risk mitigation and management literature in Nigeria. Of a secondary significance is the inadequacy of the existing practices. The government and other stake holders have made some successes in the management of the several flood disasters, but, more needed to be done.

Hence, Adekola and Ogundipe (2017) in a study of an assessment of the state of environmental management in Nigeria capital cities found that most of them were environmentally unfriendly. They also found that only 4 out of the 36 state capital cities passed the 5 likert scales of environmental safety practices of;

- i. Effective and efficient waste management board.
- ii. Non-moribund ministry of environment.
- iii. Embracing effective horticulture and green environment.
- iv. Effective and efficient transport management agency.
- v. Central and well managed motor parks.

Literature Review

Conceptual and Theoretical Framework

The concepts and theories underlying Flood Insurance have received great attention by several researchers, especially environmentalists. For instance, Browne and Hoyt (2000) present Smith's (1968) model of demand for insurance covers as a function of individuals' ability to form correctly the estimates of the probabilities associated with potential losses./Continuing, Browne and Hoyt posited that the major determinants of individual insurance consumption include wealth, probability of loss, insurance premium, value of vulnerable property, and perception of the insurance consumer. On the other hand, Mayers and Smith (1982) as (cited in Brown & Hoyt, 2000) argued that profit maximization is the major determinant of business demand for insurance, adding specific factors as income and

wealth. Hence, lack of insurance education can hardly be ignored as a major cause of the paucity of insurance consumption in Nigeria.

Causes and Effects of Flood Disasters in Nigeria

Major urban cities of the world are at high risk of flood disasters due to the dynamic climatologically phenomena, resulting in either severe drought or rain falls (Tingsanchali 2011). Nigerian cities are no exception especially being in the tropical region. Most of the Nigerian cities grew out of no significance due to initial lack of government attention and hence features such as narrow streets adopted as major road patterns with poor drainage channels, absence of refuse dump cities and scarce trees and flowers. In most parts of Nigeria, weak town planning legislation pave way for people's resistance to change as many people cluster around urban ancestral lands. Poverty also continues to strengthen many inhabitants' nuances associated with their resentment to vacate flood plains citing cultural affinity as reasons for not leaving such areas. Some belief that they should not leave their places of origin where their parents were buried. Yet others resist vacating where they have easy access to better facilities like markets, schools, electricity, etc.

According to Huguet, Bertin, and Amaud(2018), urban cities the world over are centres of attraction to facilities such as electricity, markets, government presence, trade or business, etc. Hence, most urban cities are usually characterized by high density population causing housing congestion and overcrowding adding more pressure to the land plains. According to Oruonye (2015) the human factor contributing to the worsening urban flooding in Nigeria consists of poor town planning and poor environmental habits. The researcher the 2008 two days' heavy rains of several hours which affected 14 states in Nigeria, namely: Cross River, Anambra, Akwa-Ibom, Rivers, Bayelsa, Niger, Kebbi, Kogi, Jigawa, Taraba and Plateau, left an estimated 3 million people homeless, many dead, public buildings and facilities, farm lands, crops etc. swept away (Oladegbola and Akinlade, 2019).

Flooding in Jalingo Metropolis, Taraba State

The National Emergency Management Agency (NEMA, 2012) considers the flood disaster losses in Jalingo Metropolis in August, 2005, July and August 2008 and September 2012 and August, 2018 the worst calamities of the last three decades, estimated at several millions of naira, with many lives lost. Jalingo town lies on gentle, sloping land in between high lands and it is popularly known and called Muri plains. The town lies between 305m-610m above sea level which rises to about 945 meters above sea level in the North East. Characterized by rivers and streams including the Lamude River with its tributaries leading to River Benue heading into the Atlantic Ocean in Southern Nigeria. The surrounding rocky hills are as high as above 300 meters in the Northern, Eastern and Southern parts of the town. The major causes of flooding in Jalingo Metropolis like in many urban cities in Nigeria have been attributed to prolonged heavy rainfall of 2 to 8 hours for 2-3 days'water run offs (Oruonye, 2015). Poor drainage fadama soils and flat and low lying topography are liable to flooding (Oruonye, 2015).

Table 1: Flood Disasters in 2012 and 2018

S/N	Description of Disaster	2012	2018
1	Number of Death	363	141
2	People Displaced	2.1 Million	600,000
3	Houses Destroyed	7,320	5,732
4	Estimation of other losses	2.5 Trillion	1.75 Trillion

Source: NEMA, 2019

Insurable Flood Disaster Risks in Nigeria

Insurance is a contract between two parties in which the insurer or the assurer indemnifies the insured against certain losses which can affect the latter. In order to mitigate or alleviate the threat of flood peril, a vulnerable person pays either a lump sum or a series of premium to the insurer/assurer in consideration for compensation payable to the insured. Slater's Mercantile Law defines insurance as the purchase of security (or policy) against the insured risk (in this case flood disasters).

The Nigerian Metrological Office has put the state of rainfall risks as in Jalingo; strong rains 0.52, mild rains 0.30 and average rains 0.175 with associated probabilities 0.65, 0.15 and 0.20 respectively.

Table 2: Measurement of Flood Disaster Risks in Jalingo

S/N	State of Rains	Probability of Flood	Risk of Losses
1	Strong Rains 0.5	0.65	0.525
2	Mild Rains 0.3	0.15	0.30
3	Average Rains 0.2	0.20	0.175
Total	100	100	100

Sources: (NEMA, 2019)

Table 2 shows the prevalence of rainfall in Jalingo as strong rains at 65% compared to mild rains of 15% and average rains of 20%. Flooding is the most common natural disaster across the globe (Flood Insurance Guide, 2019). It is also the most expensive, costing homeowners, insurers, and governments billions of dollars each year in countries like the USA, Britain and many other developed countries. If most of one's wealth can be tied up in houses without flood insurance amount to risking financial ruin. Most Nigerians have substantial part of their wealth tied up in their houses and in their trading and shops, thereby putting all eggs in one basket, without adequate flood disaster insurance coverage.

Everyone needs insurance. An individual does not need to live in a flood zone to need flood insurance. However, it may not be essential for people living outside flood plains or non-mortgage owners. According to the American Insurance Information Institute, flood damages are mostly associated with people and properties situated at low to moderate plain lands, requiring flood insurance. However, to the American Flood Insurance (AFI), every one lives in

a flood zone. According to AFI, the types of insurance covers suitable for flood disaster include;

- i. Personal property (contents) insurance policy covering personal house(s).
- ii. In house renting, personal belonging insurance policy covers only personal belongings.
- iii. Non-residential property insurance policy covers buildings and contents, plus other non-residential losses.

Flood insurance does not start immediately as storms heads its way to effect.

At least, a 30-day waiting period is set aside for processing of applications, except in few instances like renewal. People in flood prone areas mapped as flood zones by FEMA, SEMA and LEMA can take Preferred Risk Policy (PRP) payable once annually or up front eased through the use of internet bank transfers, master cards, and visa and as may be negotiated.

Materials and Methodology

Research Design

Descriptive and exploratory research designs were used for this study. According to Agu (1992) and Adefila (2008), a descriptive design gives a description of a scenario, or occurrence of an event. Adefila further posited that a descriptive design describes a situation or event which is an end on its own. This design is suitable for the description of urban flood and that of interventions of flood disaster management agencies. Exploratory research design deals with the curiosity to gain more understanding of a subject matter. This design is also suitable for assessing the feasibility of flood insurance for the vulnerable urban dwellers in Nigeria.

In the study, questionnaire administration and oral interview were used for collecting primary data, while secondary data were collected from Federal, State, and Local Governments' Environmental Agencies (FEMA, SEMA, and LEMA) respectively, and from the Metrological Agencies in Jalingo. Other secondary data were collected from Journals, Unpublished Thesis, Internet and workshop/conference papers and the Geographical society of Nigeria. This study in no way attempted to determine how insurance will substitute government efforts in flood disaster management in Taraba State of Nigeria. It attempted only to identify flood disaster as an insurable risk which people can understand and accept as a complementary measure for mitigating flood disaster risk management in Nigeria.

Secondly, this study did not aim at determining how insurance can stop flood in the state, but simply aims at inducing policy making on insurance education and also the insurable public on the importance of flood insurance against the perils in flooding to reduce its impact on stake holders, particularly the victims.

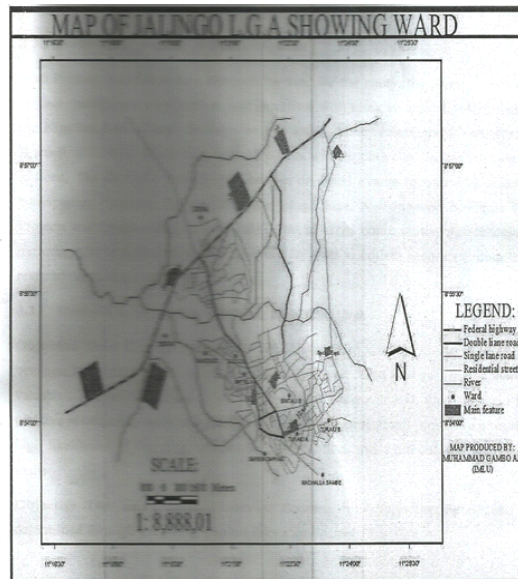


Fig. 5: Map of Jalingo Local Government Area of Taraba State

This study employs the quantitative and qualitative approaches. The study areas were purposefully selected as locations frequently affected by flood disaster occurrences in Jalingo Metropolis. They include:

- (i) Nasarawo
- (ii) Rugby Academy
- (iii) Baba-yau
- (iv) New CBN
- (v) Nana-Aisha

Quantitative data were obtained. Three days on the spot distribution of one hundred questionnaires were distributed to 100 (or 20 per 5 flood prevalent area) respondents. Carefully prepared Bio data and carefully constructed closed ended questions on core issues formed on number of flood disaster incidences, major cause of flooding in the areas, number of human lives lost in each incidence, approximate naira value of properties lost, flood prevention measures, flood disaster management ratings, long term aftermath of flood disaster assistance and its source, insurance status of respondents formed the second section of the first set of questionnaire. Qualitative data were carefully sourced from key individuals and institutions who participated in the management and mitigation of flood disaster in Jalingo were purposefully selected include the FEMA, SEMA and LEMA, Red Cross, Civil Defense Hospitals and Clinics used as treatment centres. Others include community leaders, metrological agency, ministry of environment etc.

A second set of questionnaire on policy, and institutional issues in 120 copies sought information on number of lives lost, properties lost, flood disaster prevention mitigation and management policies, equipment deployed, aftermath treatment to survival victims, budgeting and financing the participating agencies, public enlightenment programmes, reconstruction and rehabilitation programmes, etc.

In addition, to the two sets of questionnaire, oral interviews were granted for on spot assessment to perceived eye witnesses like 'Keke Napep' transporters, divers, vigilantes and traders or shop owners and press men. Qualitative information from these set of perceived eye witnesses were on corroborative, assessment and analytical in nature, i.e., 100(or 20 per each category of perceived eye witnesses) were interviewed, bringing the sample size to 320.

Results and Discussions

Data Presentation and Analysis

The data collected from the flood disaster affected areas of Jalingo Metropolis are as follows:

Table 3: Number of Heavy Rains (X) and Disaster Incidence (Y) in Jalingo

S/N		Annual average intense rain, X	Flood disaster, Y
1	Nasarawo	210mm	0.3
2	Rudgu-Academy	160mm	0.2
3	Baba-Yau	170mm	0.2
4	New CBN	180mm	0.22
5	Nana-Aisha	150mm	0.08
Total		870mm	1.0

Source: Metrological Agency, 2019

Table 3 shows that Nasarawa has the highest annual average intense rainfall and hence the highest prevalence of disaster, whereas Nana-Aisha has the least with corresponding least disaster probability.

Diversification of Risks in Flood Disasters

It will be irrational and not good to prepare only one strategy of mitigating risk (NIA, 2019). Buttressing this stance, NIA opined that investing in insurance helps in spreading risk in different ways, 'Don't put all your eggs in one basket' is a popular proverb worth practicing by taking several ways including insurance to mitigate flood disaster risk. Are the temporary relieves and management of flood disaster plus ineffective prevention mean that people have put all resources in one basket? If so, then government and the vulnerable should invest in;

1. Prevention education and public enlightenment
2. Effective and efficient flood disaster management
3. Effective and diversified mitigation of disaster risks

Table 4: Measurement of Flood Risks

State of Rain	Probability of Flood	Risk
Prolonged, Intense Rain 0.5	0.65	0.375
Mild Rain 0.3	0.15	0.30
Average Rain 0.2	0.20	0.325
Total	100	100

Source: FEMA, 2019

Table 4 also show prolonged intense rain has the highest probability of 0.375flooding with mild rain having the least probability of flooding of 0.30.

Flood disaster (FD) = Probability of Flood Hazard P(FH) + Vulnerability = FD = P(FH) + Environmental Vulnerability ± Bursting Dams

Gains through Diversification

Gains = Investment in several ways rather than only one or two ways.

High Mitigation = High Risk Reduction from flood

Table 5: Human Deaths in Flood Disasters in Jalingo

S/N	Area	Number of Deaths				Total
		2005	2008	2012	2014	
1	Nasarawo	12	7	10	6	35
2	Rudgu-Academy	3	4	5	3	15
3	Baba-Yau	3	3	5	5	16
4	New CBN	4	4	5	5	18
5	Nana-Aisha	2	2	3	4	11
Total		24	20	28	23	95

Source: N.E.M.A, 2019

Similarly, to table 3, table 5 shows that Nasarawa has the worst flood disaster over the years compared to the other areas vulnerable to flood disaster in Jalingo metropolis. Nana-Aisha on the other hand had the least disaster following its lowest vulnerability among the prevalent intense rainfall incidences.

Table 6: Respondents' Views on Flood Disaster Enlightenment

S/N	Area	Adequate	Inadequate	Uncertain	Total
1	Nasarawo	5	14	5	35
2	Rudgu-Academy	6	14	4	15
3	Baba-Yau	3	17	4	14
4	New CBN	2	16	6	14
5	Nana-Aisha	3	18	3	17
Total		19	79	22	95

Source: Field Survey, 2019

Table 6 shows that 79 respondents (or 83%) posited that there was inadequate flood disaster enlightenment campaign compared to 19 (or 2%) who agreed to adequate awareness.

Eye Witness Assessment of Flood Disaster Mitigation and Management in Jalingo

Having interviewed respondents on the adequacy of flood disaster mitigation and management in the affected areas of Jalingo metropolis, 60 respondents (or 63%) faulted the intervention measures compared to 30 (or 32%) who agreed that the measures were satisfactory.

Similarly, the interviews with the respondents show that 61 of them (or 64%) corroborated that the 3 major causes of Jalingo urban flooding were climatic changes, settlements on waterways, overcrowded settlements and blockage of water channels.

Table 7: Respondents' Insurance Status

S/N		Total	Flood Insurance Policy Holders	Non-Flood Insurance Policy Holders
1	Flood disaster survivals	100	-	100
2	Disaster mitigation and management personnel	120	4	116
3	Eye witnesses	100	2	98
Total		320	6	314

Source: Field Survey, 2019

Table 7 shows that of the 100 flood disaster survival respondents none had flood insurance cover, while only 4 members out of 120 intervention teams had flood insurance. And of the other 100 eye witnesses interviewed, only 2 had flood insurance. Generally, only 6 (or 2%) of the 320 respondents had flood insurance compared to 314 (or 98%) had no flood insurance. In the same vein, interviews with 100 respondents in the study localities revealed that 89 of them (or 89%) posited lack of public enlightenment on measures like tree planting and good drainage system.

Discussion and Findings

In this study, the questionnaire administration, oral interviews and literature reviewed the following.

Severe Flood Disaster Occurrence in Nigeria and in Jalingo metropolis of all the 100 surviving victims interviewed on the incessant flooding in Jalingo, 94 (or 94%) respondents affirmed that deadly flood disasters occurred in 2005, 2008, 2012, and 2018 (Table 5) in which 24, 20, 28 and 23 deaths were recorded respectively. Records of total flood disaster human losses of 2012 were 362 and 141 deaths in 2018 respectively (Nigerian Archives, 2019).

The frequency and severity of the finding in this study corroborate with the finding of Olanrewaju et al (2019) and that flood disaster is one of the worst natural disasters the world over.

Flood Disaster Risks Mitigation in Jalingo

Flood disaster risk mitigation includes all the measures and practices feasible for reducing or averting incidence of flood disaster. In this study, it was found like in several earlier studies that mitigating measures like hydrological models, automatic weather observation and rain guides for rain forecasts were absent. In addition, tree planting, river dredging, adequate drainages, public enlightenment amongst others were not adequately practiced.

Examination of Flood Insurance as a Complementary Strategy for Flood Disaster Risk Mitigation in Jalingo Urban

From the review of several literatures on the study of flood disaster mitigation, it was found that most of them were on its practices of urban planning, public enlightenment and others without any financial intermediation beyond the management of such disaster. This lacuna necessitated this study. It was found that out of 320 respondents, only 314 (or 98%) held flood insurance policies. Currently, most people vulnerable to flood disaster have put all their eggs in one basket by relying on only the temporary services of the government and non-governmental intervention during flood disaster management.

Oral interviews also revealed that lack of; finance, equipment, transportation, and expertise contributed to the poor coordination and inadequate synergy among the intervention agencies. This finding also corroborates with that of Olanrewaju et al (2019).

Conclusion and Recommendations

Urban flood disasters in Nigeria have largely resulted from a combination of factors like; heavy rain falls and human factors. These researchers conclude like in previous studies on flood disaster management in Nigeria that so far, no viable, permanent, preventive and mitigating measures have been applied. Again, there has been no evidence of real synergy between the flood disaster intervention and management agencies.

The researchers thus recommend the following:

- i. Introduction of adequately induced flood insurance for the vulnerable urban dwellers
- ii. Proper coordination for synergy between flood prevention and management agencies.
- iii. Decisive funding and reviews of relevant legislation
- iv. Sincere and vigorous commitment to duty by the relevant agencies

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