

The Aftermath of 2012 Flooding in Ibaji and Lokoja Local Government Areas of Kogi State-Nigeria

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Abstract: Flooding can almost be considered as chronic condition that persist throughout the year, the economic losses and the number of people who have been affected by flood have increased more rapidly. This study was carried out to evaluate the aftermath of 2012 flooding in Kogi State, Nigeria. This paper focuses on the concept of flooding with the view to identifying the causes, the roles and responsibilities of stakeholders in disaster management and recommending measures for effective disaster management. A total of 400 structured questionnaires were administered through self, out of which 323 were screened. Analyses were carried out using Statistical Packages for Social Sciences (SPSS) and Microsoft excel where frequency means and percentages were employed to interpret the results. Based on Likert scale ranking, findings show that flood victims lack knowledge and information on the cause of flooding, politicization of disaster management by stakeholders in favour of urban areas and the traditional method of response, rescue and relief are not proving helpful. Further research focuses on long term preventive measures such as Community Based Disaster Management (CBDM) which seeks to build local capacities and disaster resilient communities for development.

Keywords— Flood impact, Vulnerability, Sustainability, Community Based Disaster Management, Nigeria

1. INTRODUCTION

Flooding causes significant loss globally and is often seen as the most devastating natural hazard. Consideration from a global scale, it represented 35% of all economic losses during 2013 (Ogunyoye and Dolman, 2014). Both developed and developing countries were not spared out of the menace for the year 2012, 2013 and 2014. Natural disaster predominantly floods are actually no longer annual events but can almost be considered as chronic conditions that persist throughout the year (Kyung and Jae-ho, 2012). This is in consistent with the findings of Muir-Wood, Miller and Boissonnade (2006) that extreme weather events such as temperature, droughts, storms, precipitation and floods are on the growth due to anthropogenic drivers of global climate system and are projected to be more frequent in diverse parts of the world. Just as we are experiencing already that the quest for greener pasture is attracting populace to urban areas.

The Intergovernmental Panel on Climate Change (2007) reported that the mass migration from rural to urban areas pose population around the globe at risk since many major cities are situated near riverine and fault lines. Centre for Research on Epidemiology of Disasters (CRED, 2012), accounted some of the flooding within the same periods that recorded severe case-studies on the global headlines to include: the floods in Brazil (January 2011); devastating floods in Thailand and Queensland (Australia) in 2011; floods in Thailand, Indonesia, Namibia and Fiji (In 2012).

There was a prediction by UN-HABITAT (2008) that the Nigerian coast being one of the low-lying coasts in Western Africa is likely to experience severe effects from flooding due to rising sea levels and climate change and this prediction came to past.

In October 2012, flood devastated 14 States namely Cross River, Akwa Ibom, Rivers, Bayelsa, Delta, Anambra, Imo, through Edo to Niger, Benue, Taraba, Jigawa, Plateau and Kogi (as the worst hit among the affected states). Thereafter, accounts of woes came such as deaths and destruction of homes, public buildings, roads, bridges, public utilities, crops, livestock and farms worth several millions of Naira were reported. In Kogi State alone, it was reported that more than 500 thousand people were dislodged from their homes. Nine out of the 21 Local Government Areas were hit namely; Ibaji, Lokoja, Bassa, Idah, Omala, Ajaokuta, Igalamela/Odolu, Ofu and Ankpa, with the worst affected being Ibaji that was completely submerged, then followed by Lokoja (National Emergency Management Agency NEMA, 2012). Ibaji community occupies an area of 1,377 square kilometres and has a population of over 150 thousand. Disaster mitigation and prevention are therefore essential preconditions for each other. Pandey and Okazaki (2005) indicate that effective disaster management can fully benefit humanity because it will impact on the environment, serve as a human intervention for sustainable development and improve food security. Furthermore, current development studies prove that assistance in times of

disasters can serve as a tool for national development. As a result of this, various efforts of disaster management were put in place by the stakeholders in order to mitigate the effect created by the flood since Nigeria is not immune to the socio-economic and the negative developmental impacts of

- i. To establish through literature, the concept of flood with the view of identifying the cause of the flooding in the study areas.
- ii. To assess the impacts of the flooding on livelihood in the study areas.
- iii. To evaluate the roles and responsibilities of stakeholders in disaster management.
- iv. Recommending measures for effective management of disaster in the study areas.

2. Concept / History of Flooding in Nigeria

Flood is an overflowing of a great body of water over land not usually submerged. Abam (2006) defined flood as large volume of water which arrives at and occupy the stream channel and its flood plain in a time too short to prevent damage to economic activities including homes and infrastructures. In another development, Nwafor (2006) expressed flood as a natural hazard like drought and desertification which occurs as an extreme hydrological (run off) event. Flooding is the most common environmental hazard in Nigeria (Etuonovbe, 2011). Flood disaster is not a recent phenomenon in the country, and its destructive tendencies are sometimes enormous. The major flooding that struck Nigeria was in 1940s. According to Adedeji, Odufuwa and Adebayo (2010), the first flood ever recorded stroke Ibadan, the then headquarters of old western region of Nigeria but now the capital of Oyo State, in 1948 and afterwards the city observed shocking flood misadventures in 1963, 1978, 1980, 1985, 1987 and 1990 respectively. Floods occur in Nigeria in three main patterns: coastal flooding, river flooding and urban flooding (Folorunsho and Awosika 2001; Ologunorisa, 2004). Coastal flooding occurs in the low-lying belt of mangrove and fresh water swamps along the coast (Folorunsho and Awosika, 2001; Ologunorisa, 2004). River flooding occurs in the flood plains of the larger rivers, while sudden, short-lived flash floods are associated with rivers in the inland areas where sudden heavy rains can change them into destructive torrents within a short period (Folorunsho and Awosika, 2001; Ologunorisa, 2004). Urban flooding on the other hand occurs in towns, on flat or low-lying terrain especially where little or no provision has been made for surface drainage, or where existing drainage has been blocked with municipal waste, refuses and eroded soil sediments (Folorunsho and Awosika 2001; Ologunorisa, 2004).

2.1 Disaster Management in Nigeria

In Nigeria, National Emergency Management Agency (NEMA) has been the prime disaster management institution whose core function is to harmonize important stakeholders

flood. To this end, a study on the aftermath of flooding in Ibaji and Lokoja Local Government Area is imperative. Hence, this study focused on the following research objectives:

towards efficient disaster control. According to Daramola et al. (2016), governments at national and sub-national levels are

the ones responsible for handling issues related to natural disaster incidents. There are a number of efforts by NEMA at the national level and its corresponding agencies at the sub-national levels identified as State Emergency Management Agency (SEMA) and Local Government Emergency Management Agency (LEMA) at managing natural menaces, however these have been observed or perceived to be mostly reactive (Daramola et al., 2016). Since the accomplishments of NEMA, SEMA, and LEMA have been obvious through rescue tasks, delivery of relief resources and reposition of disaster stricken persons in some situations.

Ndace (2008) identified the two arrangements of emergency management practiced in Nigeria over the years to be the “vulture notion” and the “eagle notion”. In the classification of the two concepts, Okoli (2014) views the vulture notion as reactive in personification and the eagle notion as proactive. This signifies that emergency management in Nigeria must transfer from the practice of reactive support system to a vibrant order that is responsive to eventuality thinking and procedure.

Daramola et al. (2016) identified poor efforts at improving preparedness and called for proactive and preventive step in managing natural impacts. It is in the light of this that Okoli (2014) , suggests that Nigeria should discourage the habit of waiting for disaster to happen before taking safe moves but encourage a more logical, self-motivated, flexible, and proactive system proficient of averting hazard events and mitigate as well. The potential of effective emergency management lies in a paradigm shift from business as usual (reactive) to a proactive mandate that accentuates the priority of disaster risk reduction and control.

NEMA as the principal player in emergency management of the country is faced with some constraints and anticipations. The core among these constraints as identified by Okoli (2014) is the need to integrate emergency interests into national development plan. The stakeholders of Nigeria’s emergency management can be characterized into three all-encompassing responders namely; primary (community based institutions like community associations or societies, Religion Based Organizations, vigilante groups, grass-root volunteers), secondary (the military, the Police force, Para-military organizations, NEMA, and the Red Cross Society), and tertiary (humanitarian and development agencies both local and international).

As indicated above, the basic duty of NEMA among others is the coordination of all stakeholders involved in disaster management by setting up of agreed goals, and allocation of tasks and responsibilities according to mandates and capacities of the stakeholders. This achievement can only be achieved if cognizance is given to effective legislation (International Federation of Red Cross, 2012), public private partnership (PPP) (Lassa, 2013) and community volunteerism (NEMA, 2010; 2011) which are the constituents for dominant new thinking in disaster management. Hence, need for sustainable strategies in the management of natural disasters predominantly floods in Nigeria becomes a burden on every concerned citizens and the government as a whole. The authors were motivated to delve into this research so as to recommend measures that can improve sustainability and resiliency in the attempt to manage disasters by incorporating the community into all stages of decisions regarding their environment and livelihood recovery.

The next section talks about the methods adopted for data collection and analysis.

3. Research Methodology

The research design employed for this work was the descriptive survey in which flood victims in the study areas were randomly selected. The areas covered in this research are Ibaji and Lokoja Local Government Areas. The sample size for the study was derived from Krejcie & Morgan's

(1970) sample size table for a given population of 5817 victims. It was found that for a population size around 6000, Krejcie & Morgan recommend that a sample size of 361 should be used. However, to avoid issues related to adequacy of returned questionnaires 400 numbers of well-structured questionnaire containing closed ended questions with suggested answers measured in a Likert scale was administered by self to the respondents. The screened questionnaires used for analysis was 323. Based on the population of Lokoja and Ibaji communities, percentage of sample size from the overall population which represents the number of questionnaires administered in each of the communities is 190 and 133 for Lokoja and Ibaji respectively. The analysis was carried out using Statistical Packages for Social Sciences (SPSS) and Microsoft excel where frequency means and percentages were employed to interpret the results.

4. Results and Discussion

This section presents the findings and discussion for this study. Discussion of findings was done with reference to the results in the tables accordingly.

Research findings in **Table 1** with regards the distribution of respondents by gender reveal that 60.0% and 68.4% of the respondents are male and 40.0% and 31.6% are female in Lokoja and Ibaji respectively. The appreciable increase in the number of men than women may be due to Nigerian context of household since men are the heads of the family.

Table 1: Gender of Respondents

Gender	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Male	114	60.0	91	68.4
Female	76	40.0	42	31.6
Total	190	100	133	100

The age distribution of respondents as shown in **Table 2** reveals that, the majority of respondents are within the age bracket of 16-25years representing 45.3% and 62.4% in

Lokoja and Ibaji communities respectively. This is an indication of an active and youthful population who are most responsive to activities in the communities.

Table 2: Age of Respondents

Age (yrs)	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Below 15				
16-25	67	35.3	8	6.0
26-35	86	45.3	83	62.4
36-45	29	15.3	25	18.8
46-55	-	-	17	12.8
56 and above	-	-	-	-
	8	4.1	-	-
Total	190	100	133	100

Findings as shown in **Table 3** reveal that in Lokoja 16.8% of the respondents have never attended school; 11.1% have primary education; 39.5% have secondary; 32.6% have attended tertiary institutions. While, in Ibaji LGA 18.8% have primary education; 43.6% have secondary and 37.6% have attended tertiary institutions. This implies that majority

of the respondents have secondary school and tertiary education, which place them in a better position of appreciating and assessing the situation as well as the capacity to implement strategies for sustainable Disaster Risk Reduction.

Table 3: Level of Educational Attainment

Level of Education	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Never Attended School	32	16.8	-	-
Primary School	21	11.1	25	18.8
Secondary School	75	39.5	58	43.6
Others	62	32.6	50	37.6
Total	190	100	133	100

Findings in **Table 4** reveal that majority of the respondents have resided in the present location for more than six (6) years with an aggregate percentage of 87.9% and 97.7% for Lokoja and Ibaji LGAs respectively. This indicates that the

respondents have a very good knowledge of their environment and a form of attachments to the study area which makes relocation difficult in cases where that is the only option available.

Table 4: Duration of Stay

Duration of Stay (yrs)	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
1-5	23	12.1	3	2.3
6-10	129	67.9	88	66.2
11-15	8	4.2	23	17.3
16-20	3	1.6	19	14.2
25 and Above	27	14.2	-	-
Total	190	100	133	100

Research findings as shown in **Table 5** reveal that the occupation of respondents include Farming which accounts for 30% in Lokoja and 37.6% in Ibaji, Fishing accounts 60% in Lokoja and 24.8% in Ibaji; Trading accounts for 10.0% in Lokoja and 13.5% in Ibaji. Those that are unemployed

account for 18.8% in Ibaji only. Occupation is a determinant of the income of an individual, which further determines an individual's ability to have alternatives such as safe and standard housing.

Table 5: Occupation of Respondents

Occupation	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Farming	57	30.0	50	37.6
Fishing	114	60.0	33	24.8
Trading	19	10.0	18	13.5
Unemployed	-	-	25	18.8
Others	-	-	7	5.3
Total	190	100	133	100

Table 6 reveal that 30.0% of the buildings in Lokoja are approximately less than 5 minutes' walk from the river as against 50.4% of buildings in Ibaji. 60.0% of the buildings in Lokoja and 12.8% in Ibaji are about 5-10 minutes' walk from the river; whereas, 10.0% of buildings in Lokoja and 36.8% in Ibaji are between 10-15minutes' walk from the river. This indicates that majority (90.0%) of the buildings

are within less than 5 minutes' walk from the river in Lokoja. While, in Ibaji a majority (73.2%) are within less than 5 minutes' walk from the river. This also indicates the level of vulnerability of the respondents and buildings in the event of flooding.

Table 6: Location of Building

Location of Building	Lokoja	Ibaji
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	Frequency	Percentage (%)	Frequency	Percentage (%)
Less than 5 minutes' walk from the river	57	30.0	67	50.4
About 5-10 minutes' walk from the river	114	60.0	17	12.8
Between 10-15minutes' walk from the river	19	10.0	49	36.8
Others	-	-	-	-
Total	190	100	133	100

With regards **Table 7** the causes of flooding in Lokoja, Surcharges in water level due to natural or man-made construction on flood path ranked 1st, Sudden dam failure, Deforestation of catchment's basins, Construction sites, Poor drainage, Inappropriate land use, Inadequate drainage capacity to cope with urbanization, Solid Waste, Excess encroachment in flood ways and Mudflow ranked 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, and 10th respectively. While in Ibaji, Sudden dam failure and Poor drainage both ranked 1st, Inadequate drainage capacity to cope with urbanization,

Mudflow, Surcharges in water level due to natural or man-made construction on flood path, Inappropriate land use, Excess encroachment in flood ways, Deforestation of catchment's basins, Solid waste and Construction sites ranked 3rd, 4th, 5th, 6th, 7th, 8th, 9th, and 10th respectively. The implication of the ranking above is that, residents of Lokoja and Ibaji are not fully informed of the cause of the flooding which explains the disparity in their opinions of the cause. Perhaps, there was no serious publicity or warning by government agencies prior the flooding.

Table 7: Causes of Flooding

Causes	N	Sum	Mean	Rank	N	Sum	Mean	Rank	Overall Rank
Surcharges in water level due to natural or man – made construction on flood path	190	846	4.45	1 st	133	532	4.00	5 th	(8.45)1 st
Sudden dam failure	190	715	3.76	2 nd	133	590	4.44	1 st	(8.2) 2 nd
Inappropriate land use	190	609	3.21	6 th	133	531	3.99	6 th	(7.2) 5 th
Mudflow	190	515	2.71	10 th	133	557	4.19	4 th	(6.9) 7 th
Inadequate drainage capacity to cope with urbanization	190	592	3.12	7 th	133	583	4.38	3 rd	(7.5) 4 th
Excess encroachment in flood ways	190	524	2.76	9 th	133	500	3.76	7 th	(6.52) 8 th
Deforestation of catchment's basins	190	666	3.51	3 rd	133	458	3.44	8 th	(6.95) 6 th
Solid Waste	190	543	2.86	8 th	133	424	3.19	9 th	(6.05) 10 th
Construction sites	190	664	3.49	4 th	133	399	3.00	10 th	(6.49) 9 th
Poor drainage	190	629	3.31	5 th	133	591	4.44	1 st	(7.75) 3 rd

Findings reveal that a majority (55.3%) of respondents in Lokoja stated that there was enforcement by government to evacuate people residing in vulnerable areas unlike a majority (56.4%) in Ibaji who stated there was no

enforcement by government to evacuate people from vulnerable areas (see **Table 8**). This could further be linked to the severity of the impact of the flood incidence in Lokoja and Ibaji as revealed in **Table 15**.

Table 8: Enforcement by Government to Evacuate People from Vulnerable Areas

Enforcement	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	105	55.3	58	43.6
No	85	44.7	75	56.4
Total	190	100	133	100

Respondents rating of the enforcement by government on the evacuation of people residing in vulnerable areas in **Table 9** revealed that, majority (58.1%, 60.3% for Lokoja and Ibaji

respectively) are of the opinion that the process of enforcement is not serious. This could account for why people are still resident in vulnerable areas.

Table 9: Rating of the Enforcement by Government

Response	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Serious	44	41.9	23	39.7

Not Serious	61	58.1	35	60.3
Total	105	100	58	100

With regards receiving warnings from NEMA, SEMA and LEMA prior to the flooding (see **Table 10**), majority of respondents in Lokoja said they received warnings. Unlike

respondents in Ibaji LGA who said they did not receive warning from the above mentioned agencies prior to the flooding which could also be related to the severity of impact in Ibaji LGA compared to Lokoja.

Table 10: Warnings from Government Agencies

NEMA	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	105	55.3	17	12.8
No	85	44.7	116	87.2
Total	190	100	133	100
SEMA	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	95	50.0	58	43.6
No	95	50.0	75	56.4
Total	190	100	133	100
LEMA	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	114	60.0	58	43.6
No	76	40.0	75	56.4
Total	190	100	133	100

On response to warnings received from NEMA, SEMA and LEMA prior to the flooding, findings revealed that majority (80.0% and 81.2% in Lokoja and Ibaji respectively as shown

in **Table 11**) of respondents said the rate of response is not prompt which is also related to the impact and severity of impact in the communities.

Table 11: Rate of Response to the Warning

Warning Rate	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Prompt	38	20.0	25	18.8
Not Prompt	152	80.0	108	81.2
Total	190	100	133	100

During the flooding, the presence of NEMA, SEMA and LEMA were experienced in Lokoja and Ibaji LGAs which is shown in **Table 12**. This can be attributed to the urgency and enormity of task required to salvage the situation and the

publicity the incidence was accorded, as activities such as response to distress call, search and rescue and evacuation amongst others are required.

Table 12: Presence of Agencies during the Flooding

NEMA	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	133	70.0	100	75.19
No	57	30.0	33	24.81
Total	190	100	133	100
SEMA	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	123	64.74	100	75.19
No	67	35.26	33	24.81
Total	190	100	133	100
LEMA	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	143	75.26	100	75.19
No	47	24.74	33	24.81

Total	190	100	133	100
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After the flooding incidence, the presence of NEMA, SEMA and LEMA were experienced insignificantly in Lokoja and more significantly in Ibaji LGAs which is shown in **Table 13**. This can be attributed to the urgency and enormity of

task required to salvage the situation, as activities such as response to distress call, search and rescue and evacuation amongst others are required. However, Agencies presence is required with the victims so as to help build well their livelihood and to promote long term recovery programmes.

Table 13: Presence of Agencies after the Flooding

NEMA	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	19	10.0	108	81.20
No	171	90.0	25	18.80
Total	190	100	133	100
SEMA	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	38	20.0	92	69.17
No	152	80.0	41	30.83
Total	190	100	133	100
LEMA	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	-	-	92	69.17
No	190	100	41	30.83
Total	190	100	133	100

It was revealed as shown in **Table 14** that 40.0% and 31.6% of the respondents in Lokoja and Ibaji LGAs respectively experienced loss of family members. While, 60.0% and

68.4% of the respondents in Lokoja and Ibaji respectively did not experience loss of family members.

Table 14: Impact of Flooding on human lives

Loss of Lives	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	76	40.0	42	31.6
No	114	60.0	91	68.4
Total	190	100	133	100

Research findings as shown in **Table 15** reveal that the impact of flooding on farms, livestock and other businesses is more severe in Ibaji compared with Lokoja as 35.3% of respondents in Lokoja said the impact is severe compared

with 68.4% in Ibaji that said the impact was severe. This is an indication that the flooding was more severe in Ibaji than Lokoja which is consistent with the report in the introduction part of the study.

Table 15: Impact of Flooding in the Study Area

Farms, livestock and local businesses	Lokoja		Ibaji	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Severe	67	35.3	91	68.4
Not Severe	123	64.7	42	31.6
Total	190	100	133	100

Respondents in Lokoja and Ibaji both support the introduction of long term preventive measures (CBDM) to solve the flood situation in the communities which is shown in **Table 16** with 60.0% and 56.4% supporting the introduction of CBDM in Lokoja and Ibaji respectively. This

implies that the respondents (victims) do not want a reoccurrence of the flood disaster and ready to support long term preventive measure that could be introduced by the government who is the most seen or common stakeholder during the recovery process.

Table 16: Respondents Support for the Introduction of Long term Preventive Measures such as Community Based Disaster Management (CBDM) for Solving Flood Situation

	Lokoja	Ibaji
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Respondents Rate	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	114	60.0	75	56.4
No	76	40.0	58	43.6
Total	190	100	133	100

5. CONCLUSION

With the inconsistency of opinion concerning the cause of the flooding amongst flood victims in Lokoja and Ibaji, it uncovers dearth of knowledge and information on flooding amongst communities residing along the river ways. The roles of stakeholders (Government agencies) in disaster management show politicization in favour of urban areas precisely Lokoja thus making impact on livelihood more severe in the rural areas (Ibaji LGA). The traditional methods of disaster response, rescue and relief, is not

proving helpful hence need for paradigm shift from relief response to disaster risk reduction as this is in line with the new Sendai framework for disaster risk reduction (SFDRR) for 2016-2030 proposed in Japan. Further research should focus on long term preventive measures such as Community Based Disaster Management (CBDM). Since, CBDM benefit humanity, impact positively on the environment and serve as human intervention strategy for sustainable development. Thus bridge the gap between relief and development.

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