Global Journal of Arts, Humanities and Social Sciences

Vol.9, No.2, pp.49-61, 2021

Print ISSN: 2052-6350(Print),

Online ISSN: 2052-6369(Online)

AN ASSESSMENT OF POST-FLOOD DISASTER RISK RECOVERY AND RECONSTRUCTION RESPONSES OF URBAN HOUSEHOLDS IN MAKURDI METROPOLIS, NIGERIA

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ABSTRACT: *Flood disaster is increasingly becoming a common occurrence around the world due to unwholesome human activities and climate change affecting urban areas including Makurdi metropolis in Benue state, Nigeria. Given its geographic location in the Benue valley and geophysical characteristics, Makurdi regularly experiences flood disaster during rainy season with the 2012 flood event been the worse with considerable impacts on the lives and properties of urban households. This study assesses the 2012 post-flood disaster risk recovery and reconstruction responses of urban households in Makurdi metropolis. Data was collected from 200 affected households of the 2012 flood disaster in flood prone areas of the town through physical observation and questionnaire administration, and was analysed using descriptive statistical techniques. The result of the study reveals different levels of damages caused by the flood in the study area with destruction of residential houses accounting for the highest (30.6%). Post-disaster recovery and reconstruction responses vary among households with low-income households being the most vulnerable and 85% have not fully recovered from the disaster. The study reveals varying nature of recovery efforts undertaking by the affected households in the study area with 38.9% of them rehabilitated their residential buildings. The highest post-flood recovery assistance accounting for 82.4% came from victims' relatives/friends. Based on the findings, the study recommends for more sensitization of the public on proactive flood disaster risk management through preparedness; readiness, response and recovery/rehabilitation with involvement of all stakeholders in the study area.*

KEYWORDS: flood, post-disaster risk, recovery and reconstruction, urban households, Makurdi metropolis, Nigeria.

INTRODUCTION

The rapid growth in the number of people living in cities and urban landscapes is increasing the world's susceptibility to natural disasters including flooding (Schofield, 2013).Urbanisation generally increases the occurrence and impacts of floods and may expose cities to increasing flood hazards especially in developing countries. Cities in many developing countries have difficulty providing basic infrastructure and services. As a result, 30-60% of people in the largest cities of the developing world live in densely populated squatter settlements characterised by poorly constructed buildings. This is exacerbated by building on unsuitable land terrain (floodplains, unstable slopes, reclaimed land) prone to natural hazards. This development increases the flood risk by disrupting natural drainage channels. Current trends of rapid urban growth and ensuing environmental degradation increase people's vulnerability to disasters. If left unchanged, flood disasters will take an ever-greater toll on lives and properties of urban residents (Odufuwa; Adedeji; Oladesu& Bongwa, 2012; International Decade for Natural Disaster Reduction; IDNDR, 1996).

Flood disasters are the world's most frequently occurring natural disasters in recent times. Flooding is the flow of water exceeding the capacity of the channel and causing an overflow of water that rises and spreads over land thereby causing damages to lives and properties (Tingasanchali, 2011, Howard, 1978). According to IDNDR (1996), flood simply means too much water in the wrong place, and is caused by both natural and anthropogenic activities. Natural causes include low-lying topography, high tides, climate change, soil characteristics and storm surge, as well as heavy rainfall, highly accelerated snowmelt, severe winds over water, unusual high tides and tsunamis. Anthropogenic causes include urban development, dumping of solid waste into drainages, poor drainage network systems and failure of hard flood control measures like dams (Odufuwa, Adedeji, Oladesu & Bongwa, 2012). Flood hazard depends on flood magnitudes including flood depth, velocity and duration. Vulnerability is the conditions determined by physical, social, economic, and environmental factors which increase the susceptibility of a community to the impact of hazards. When flood waters physically encroach on people and infrastructure, then the vulnerability of people and infrastructure is decisive for the degree of harm and damage (Tingsanchali, 2012). Floods and their associated consequences thus remain serious threats to sustainable development (FMEnv, 2005). It affects both rural and urban areas but the impact is more severe in urban areas because of its clustered population and economic activities.

Urban floods are classified on the basis of their causes; thus we have urban floods due to local heavy rainfall, river overbank flow and flood due to high tides or storm surges. Floods due to local heavy rainfall are enhanced by inadequate or poor drainages; while floods due to river overbank flow occur when water level rises above river banks. Flood disasters have become an inherent problem in most urban areas hence many cities are located in flood plains and have continue to experience physical development with spatial dimensions which reduces storage and blocks most of the existing network of natural channels. For instance, increased amounts of impervious surfaces that are characteristic of urban areas mean reduced infiltration and vegetation cover that can absorb rainfall. These factors increase runoff which can quickly flood an area that is not properly drained. In addition, construction patterns in cities often result in clearing of large parcels of land for development. This aids degradation of natural protection and so absorption of precipitation is reduced.

More so, urban areas that are low-lying or located close to water bodies are usually more vulnerable as spatial development on the usually cheaper lands of the floodplains block natural drainage courses. This obstruction causes a build-up of water with increased precipitation which then results in flooding. Also, poor waste collection, which is typical of many cities in developing countries, means huge waste dumps that often clog the mouths of drains and increase the severity of flooding (Mngutyo and Ogwuche, 2013; Oriola, 2011; Tingsanchali, 2011). Noji and Lee (2005) are of the opinion that flood disaster takes its toll on properties, the vulnerable and underprivileged. Flood disasters derail socio-economic progress and intensify poverty by making the poor even poorer. Thus, the marked difference as regards vulnerability to flood disaster arises usually from wide gaps in access to resources and capacity for disaster risk reduction and recovery.

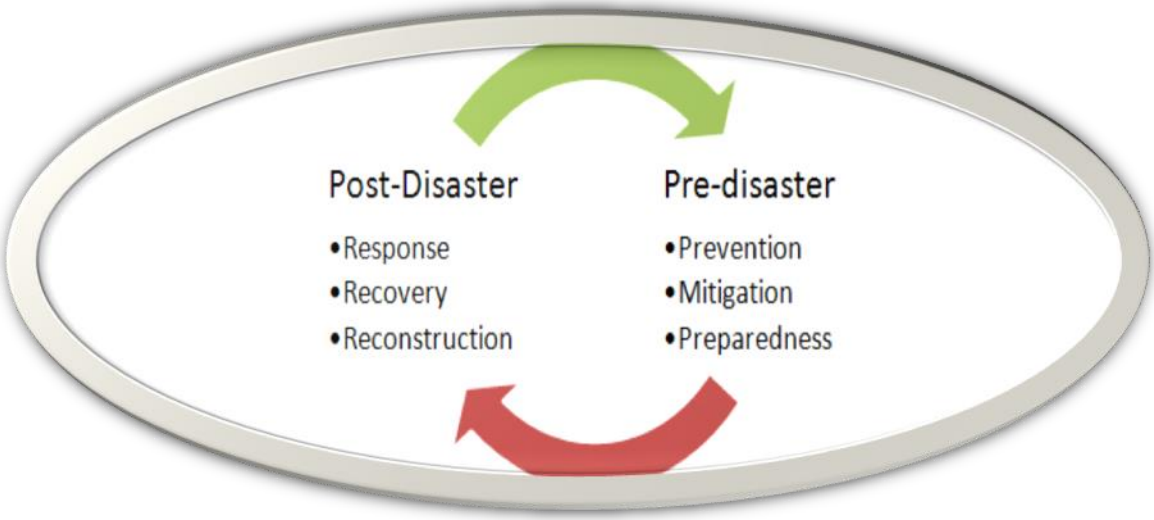
Flood impact is one of the most significant disasters in the world. More than half of global flood damages occur in developing countries of Asia, and Africa. For instance, in 2007, parts of Africa experienced one of the worst and severe flooding events that affected over 20 countries with Uganda, Ethiopia, Sudan, Burkina

Faso, Togo, Mali and Niger being the worst affected; countries including South Africa, Namibia, Botswana, Mozambique, Zimbabwe, Zambia and Malawi were also affected in 2010 and 2011 flood events. The 2012 floods occasioned by heavy downpour affected people in 13 countries in West and Central Africa including Nigeria (Egbinola, Olaniran and Amanambu, 2015; United Nations Office for the Coordination of Humanitarian Affairs, 2012; British Red Cross, 2008 &BBC News, 2007).

In Nigeria, many flood disasters have occurred in her urban areas including Lokoja, Makurdi, Onitsha, Asaba, Port-harcourt, Kaduna, Maiduguri, Ibadan, Lagos, and Warri among others. Makurdi town in particular has suffered from incessant flooding with the 2012 occurrence being the worst the town has ever recorded (Dam & Adamgbe, 2018). In most of these cases, the devastation caused by urban floods especially on households usually takes a longer time for the victims to recover and rehabilitate or reconstruct their homes/business outfits. According to IFRC (2007), non-preparedness for flood disaster prevention in developing countries make them experience greatly the impacts of flood disasters with little or no recovery mechanism. In Makurdi metropolis of Benue state Nigeria, flood events have become an annual occurring phenomenon particularly during and after heavy rainfall. The situation has worsen in recent times due to the human-induced factors such as indiscriminate dumping of refuse into the few existing drainage channels, construction of structures across the natural drainage channels as well as the sand filling of major wetlands in the metropolis for physical development. Although flooding is an annual event in Makurdi metropolis, the 2012 flood event recorded the worst impacts on lives and properties of households in the town with the following neighbourhoods almost completely submerged Wurukum, Wadata, Gboko road, Idye, Demekpe, Industrial layout, Rice mill, and Achusa. However, many people still live in these areas shortly after the flood. While the effects of flooding on the residents of Makurdi town is known (Dam& Adamgbe, 2018, Mngutyo and Ogwuche, 2013), the post-flood disaster risk recovery and reconstruction responses of urban households in Makurdi metropolis has not been interrogated. The question is what is/are the post-flood disaster risk recovery and reconstruction responses of Makurdi urban households?

REVIEW OF RELATED LITERATURE

Disaster management which is also referred to as disaster risk management is defined as the sum total of all activities, programmes and measures which can be taken up before, during and after a disaster occurred, with the aim to either avoid a disaster, reduce its impact or recover from its losses. Three stages are involved in disaster risk management which is collectively called disaster management cycle. Broadly, there are six phases in disaster management cycle. These include Prevention, Mitigation, Preparedness, Response, Recovery and Reconstruction (see figure 3).



While prevention, mitigation and preparedness are considered to be pre-disaster activities which focus on reducing the human and property losses caused by a potential hazard; response, recovery and reconstruction are phases in post-disaster initiatives taken in response to a disaster with the purpose of achieving early recovery and rehabilitation of affected victims and communities. The focus of this paper is on disaster recovery and reconstruction which fall under post-disaster responses.

Disaster recovery is relatively under-researched and there are many gaps in our knowledge and understanding. The old notions of disasters as an interruption in development, and of recovery as linear progress towards a restoration of pre-disaster normality are being superceded by more sophisticated understanding. It is now recognised that recovery is complex, exhibiting multiple and diverse patterns of change and having no fixed end point. Moreover, it takes place in a 'new normality': a context that is to some extent, irreversibly altered by the disaster itself. New insights into reconstruction and recovery processes are emerging but the empirical evidence is patchy, and as a result we are still some way from establishing broad, coherent theories.

Disaster recovery refers to the coordinated process of supporting disaster-affected communities in reconstruction of physical infrastructure and restoration of emotional, social, economic and physical well-being. This includes re-building houses and businesses, and providing medical aid and counselling, among other efforts (Chatterjee, 2016). The recovery phase starts after the immediate threat to human life has subsided. The immediate goal of the recovery phase is to bring the affected area back to normalcy as quickly as possible. During reconstruction it is recommended to consider the location or construction material of the property (Chatterjee, 2016). Álvarez-Díaz (2017) asserts that post-disaster reconstruction does not involve only rebuilding of damaged and destroyed structures but also gives an opportunity to create new designs and use improved construction techniques and materials to build stronger and sustainable structures

STUDY AREA AND METHODOLOGY

Makurdi town is one of the cities in Nigeria and is located between latitude $7^0$44'N and $7^0$55'N and longitude $8^0$20'E and $8^0$40'E (figure 1). The town is about 16km^2 radius, situated at the coast of the River Benue. Makurdi fall within the tropical humid and mega thermal climate with wet and dry seasons (Aw) according to Koppen`s classification. The climatic condition in is influenced by two air masses: the warm, moist south westerly air mass, and the warm, dry north easterly air mass. The south westerly air mass is a rain-bearing wind that brings about rainfall from the months of March/April to October. The dry north easterly air mass blows over the region from November to April, thereby bringing about seasonal dryness. The annual rainfall in Makurdi is between 1,200-1,500mm (Adamgbe & Ujoh, 2012). The temperature condition is however, generally high throughout the year with a daily of range of 23°C - 28°C and maximum of 37°C (Tyubee, 2005). Makurdi town, like most other cities in the lower Benue valley is drained by the Benue River and its tributaries including Idye, Genabe, Urudu, Kpege and Kereke streams. Due to the general low relief of Makurdi town which rises from 64-66m (210-220ft) in the river valley southwards and northwards to 154m (500ft) at Daudu settlement, sizeable portions of the town is waterlogged and flooded during heavy rainstorm (Ogwuche & Abah, 2014; FMWRRD, 1998). The town is the largest city in Benue state with a projected population of 391,924 people as at 2016 (Tser, 2013). Politically, the town is the administrative capital of Benue state and Makurdi local government council. Major socio-economic activities in the town include government establishments, urban daily markets, banks, industries, two universities among other educational institutions, hotels, filling stations. These activities generate varying degree of effects that tend to induced flood disaster in the study area.

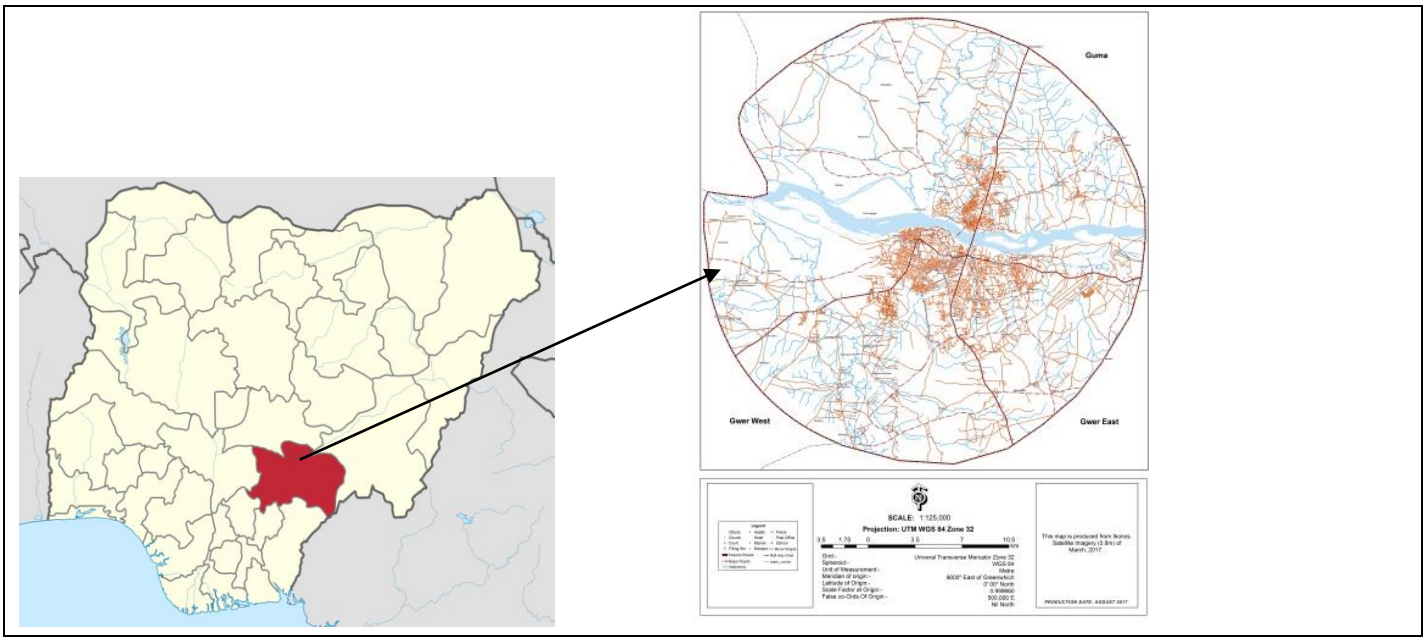


Figure 1: Map of Nigeria showing Benue State and Makurdi Town
Source: URIN, 2017

The data used in this study was collected from 200 heads of households affected by the 2012 flood event in Makurdi town. Six flood prone areas in Makurdi town were identified namely Gboko road, Wurukum, Idye, Wadata/Demekpe, Logo 1&II and Achusa from where questionnaires were administered using simple random sampling technique. The specific variables upon which data was collected include the demographic characteristics of respondents, their level of recovery and reconstruction responses after the 2012 flood disaster in Makurdi town. The data collected was analyzed using descriptive statistics such as summation and percentages.

RESULTS AND DISCUSSION

Demographic Characteristics Residents of Flood Prone Areas of Makurdi Town

The study analyses the demographic characteristics of the heads of households affected by the 2012 flood (sampled population) focusing specifically on the following variables: age, sex, educational attainment, marital status, monthly income, occupation, household size and duration of stay in the study area. The result of the field survey is presented in table 1.

The information in table 1 reveals that 62.2% of the sampled population was male while 37.8% constituted female. The dominant age group was 30 years below constituting 63.3% while those between 31-40 years and those above 40 years were 23.8% and 13% respectively. This implies that they were all adults who did not only understand flood disaster but also experienced it. The educational attainment of residents of the study area was found to be high hence 60.6% were graduates of tertiary institutions, 24.9% has secondary school education. 4.7% has primary school certificate while only 9.8% has no formal education. This implies that majority of the respondents were educated enough to be able to understand flood disaster early warnings and take necessary precautions to avoid or reduce its risk. The result also shows that 57.5% were single, 31.6% were married, 6.7% were widow/widower while 4.1% were divorced. The occupation structure of the respondents shows that majority were traders constituting 33.7%, civil servants and farmers were 20.7% each. The monthly income of respondents reveals that majority (57.5%) earns below N20,000 monthly while only 1% earns above N100,000. This implies that most of the residents of flood prone areas in the study area are low income earners.

TABLE 1: Demographic Characteristics of Flood Victims in the Study Area

Demographic Variables	Frequency	Percentage %
Sex		
Male	120	62.2
Female	73	37.8
Total	***193***	***100.0***
Age inYears		
30 Below	122	63.2
31-40	46	23.8
41 and above	25	13.0
Total	***193***	***100.0***
Educational Attainment		

No Education	19	9.8
Primary	9	4.7
Secondary	48	24.9
Tertiary	117	60.6
Total	***193***	***100.0***
Marital Status		
Single	111	57.5
Married	61	31.6
Widow/widower	13	6.7
Seperated/Divorce	8	4.1
Total	***193***	***100.0***
Occupation		
Civil servant	40	20.7
Artisan	21	10.9
Trade	65	33.7
Farmer	27	14.0
Others	40	20.7
Total	***193***	***100.0***
Monthly Income		
below 20,000	111	57.5
20,000-40,000	48	24.9
40,001-60,000	18	9.3
60,001-80,000	5	2.6
80,001-100,000	9	4.7
above 100,000	2	1.0
Total	***193***	***100.0***
Household Size		
2	61	31.6
3-4	61	31.6
5-6	58	30.1
7 and above	13	6.7
Total	***193***	***100.0***
Duration of Stay in the Area		
10 years Below	149	77.2
Above 10 years	44	22.8
Total	***193***	***100.0***

Source: Author's field work, 2019

The household sizes of the respondents ranges from 2 (31.6%), 3-4 (31.6%), 5-6 (30.1%) and 7 above were 6.7%. The field survey also reveals that 77.2% of the people have live in the study area 10 years below while 22.8% have stay in the study area for duration of more than 10 years. This implies that majority of

them have being victims of flooding including the 2012 flood event that has been adjudged as the most devastating flood ever in the study area.

Nature of Damage caused by Flood in the Study Area

The study sought to know the major damages the flood caused each household in the study area. The result of the field survey is presented in table 2.

TABLE 2: Nature of Damage caused by Flood in the Study Area

Nature of Damages	Frequency	Percentage %
Destruction of residential house	59	30.6
Destruction of fence	20	10.4
Destruction of landscaping/flowers/trees	17	8.8
Destruction of business outfits	29	15.0
Destruction of house furniture	29	15.0
Schools	1	.5
Road/drainages/culverts/bridges	8	4.1
Poultry/animals farms	6	3.1
Electricity poles/transformers	4	2.1
Physical injury	4	2.1
others, specify	16	8.3
Total	**193**	**100.0**

Source: Author's field work, 2019

The information in table 2 show different levels of damages caused by flood in the study area with destruction of entire residential house topping the list with 30.6%, destruction of house furniture and business outfits has 15% each while the least reported damages were physical injury and destruction of electricity poles/transformers which has 2.1% each. Based on this result, the impacts of the flood vary both in type and magnitude among residents of the study area.

Post-Flood Recovery/Reconstruction Efforts in the Study Area

The post-flood recovery/reconstruction efforts of the affected residents in the study area were also assessed. The result of the field survey is presented in table 3.

TABLE 3: Effort towards Recovery from the Flood Damages

Have you made any recovery effort after the flood damages?	Frequency	Percentage %
Yes	193	100
No	0	0
Total	193	100.0
if yes, state your level of recovery		
Fully	29	15.0
Partially	164	85.0
Total	193	100.0

Source: Author's field work, 2019

The information in table 3 shows that all the victims of the 2012 flood event in the study area have made efforts to recover/reconstruct their affected properties however, only 15% have been able to fully recover/reconstruct their affected properties. This implies that majority of the residents are still struggling to recover from the devastating effects of the flood. This has confirms the fact that the devastation caused by floods especially on households usually takes a longer time for the victims to fully recover and rehabilitate their structures. The nature of recovery/reconstruction was also assessed and the result of the field survey is presented in table 4.

TABLE 4: The Nature of Recovery/Reconstruction in the Study Area

Nature of Recovery Efforts	Frequency	Percentage %
Rehabilitation of residential building	75	38.9
Remodel and built a new building entirely	7	3.6
Re-established the business out fit	28	14.5
Rehabilitate the landscape/plant new flowers	5	2.6
Reconstruct the damaged culverts/bridges, drainages and roads	12	6.2
Rehabilitates the electricity facilities	7	3.6
Replace/rehabilitate destroyed house furniture	29	15.0
Renovate Poultry/animals farms	6	3.1
Healed from the physical injury sustained	8	4.1
Reopened/ renovate the school	2	1.0
others, specify	14	7.3
Total	193	100.0

Source: Author's field work, 2019

The result of the field survey as presented in table 4 reveals varying nature of recovery efforts undertaking by the flood affected households in the study area with 38.9% rehabilitated their residential buildings, 15% replaced their house furniture, 14.5% re-established their businesses that were affected while 3.6% of the affected households remodelled and built new buildings entirely.

Assistance Received for Post-Flood Recovery/Reconstruction

The study attempt to determine the sources and types of assistance victims of the 2012 flood disaster in the study area received. The result of the field survey as presented in table5 shows that

TABLE 5: Source and Nature of Assistance received for Post-Flood Recovery

Get any assistance for recovery?	**Frequency**	**Percentage %**
Yes	97	50.3
No	96	49.7
Total	***193***	***100.0***
Source of Assistance		
Federal government	6	6.1
State government	5	5.1
Non-governmental/Civil Society Organisation (NGO/CSOs)	6	6.1
Relatives/Friends	80	82.4
Total	***97***	***100.0***
Nature of assistance received		
Money	71	73.1
Materials	21	21.6
Reconstruction/renovation of affected private facilities	1	1.0
Others	4	4.1
Total	***97***	***100.0***

Source: Author's field work, 2019

97 respondents constituting 50.3% of the flood victims got one form of assistance for recovery in the study area. This implies that 49.7% of the victims did not get any assistance. The result also shows that out of the 97 victims that got one form of assistance for the recovery, assistance from federal, state governments and NGOs/CSOs were the least accounting for 6.1% ; 5.1% and 6.1% respectively while the major source of assistance came from relatives and friends accounting for 82.4%. This implies that both government and NGOs/CSOs efforts in assisting victims of flood in the study area to recover or rebuild/rehabilitate their

homes or businesses after the disaster were too little. It therefore, shows that the response from relatives and friends in assisting victims in the study area is more commendable. This assistance came in different forms including money (73.1%), materials (21.6%), and reconstruction/renovation of affected facilities (1%) while others accounted for 4.1%.

Challenges Encountered During the Recovery Process

The study also sought to identify challenges affecting post-flood recovery process in the study area. The result of the field survey is presented in table 6

TABLE 6: Challenge encountered during the recovery process

Challenges encountered during the recovery	**Frequency**	**Percentage %**
Lack of funds	118	61.1
Attitude of the labourers	17	8.8
Use of inferior materials	20	10.4
Flood frequency	12	6.2
Lack of drainages	12	6.2
poor attitude of some people towards the environment	4	2.1
Unplanned/uncontrolled physical development	8	4.1
others	2	1.0
Total	***193***	***100.0***

Source: Author's field work, 2019

The information in table 6 shows different challenges encountered by victims in their bid to recover/reconstruct from the flood disaster in the study area. The major challenge reported is lack of funds which accounted for 61.1%. This challenge is expected given that majority of the victims are low income earners with 57.5% of them earning less than N20,000 in a month. Other challenges encountered include use of inferior materials (10.4%), lack of drainages (6.5%), unplanned/uncontrolled physical development (4.1%) among others.

CONCLUSION AND RECOMMENDATION

Flood disaster inflicts many losses to households including loss of lives, physical injury/health hazards, and destruction of properties as well as livelihood sources. Efforts toward recovery and reconstruction are capital intensive hence the need for efficient management of floods is essential. This includes accurate projection of

floods, proper planning of settlements and environmental conservation, which improves on the predictability of torrential rains and storms that cause extensive flooding. Based on the findings, the study recommends for more sensitization of the public on proactive flood disaster risk management through preparedness; readiness, response and recovery/rehabilitation with involvement of all stakeholders in the study area.

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