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# Public Perception of Flood Hazard In Kafanchan, Jama'a Local Government Of Kaduna State

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## Abstract

Floods are the most common natural disaster and the leading cause of natural disaster fatalities worldwide. Risk of catastrophic losses due to flooding is significant given deforestation and the increasing proximity of large population to coastal areas, river basin and lakeshores. The study examines the causes of flooding, perception and various method of flood adjustment in the study area. Data on the public perception of flood were compiled using structure questionnaires purposive random sampling technique was used to identify households in 4 neighborhoods. Simple descriptive statistics was used to analyze data generated. It is confined that 31%of household fall with the age of 55 and above with education qualification up to tertiary education and on the awareness of flooding, 87% aware of the flood and 98% had experienced flood in the area. It is further reviewed that 34% of households were born in the area while 32 have accommodation problem. On the causes of flooding 82% recognized heavy and continues rainfall as the major causes of flooding. Majority of households (39%) agreed that flooding destroy farms food and cash crops while 24% mentioned that it destroys animals and properties and 64% pointed positive effects as it deposit fertile alluvial floodplain as well as fishing in the area as observed by 32%, construction of embankment to reduce flooding was identified by 39% and improve channel also observed by 20% as methods of adjustment. Expanded monitoring of floods, effective communication with civil authorities and vulnerable population has the potential to reduce loss of life in future flood events.

***Keywords***: Flood, Public Perception, Households and Properties

## 1. Introduction

Flood remains one of the major causes of material disaster affecting society. In a study of major natural hazards, on a world-wide scale, flood ranked first of sixteen natural disaster, Ologunorisa(2006).
Nwafor (2006) define flood as a natural hazard like drought and desertification which occurs as an extreme hydrological (runoff) event, on the other hand,Abam (2006) defined flood as a large volume of water which

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arrives at and occupy the stream channel and its flood plain in a time too short to prevent damage to economic activities including homes.

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. Report have it that serious flood disaster have occurred Yobe(2000) and Akule (2000,2004 and 2006) the coastal cities of Lagos, port Harcourt, Calabar, Uyo, Warri among others have severally experience incidence that have claimed many lives and properties worth millions of dollar. Flood occurs in Nigeria in three main forms: coastal flooding, river flooding and urban flooding (Folorunshoand Awosika2001, Ologunorisa, 2004). River flooding occur in the flooding plains of the large rivers, while sudden, short-lived flash flood are associated with rivers in the inland area where sudden heavy rain can change them into destructives torrent within a short period (Folorushoand Awosika2001; Ologunorisa, 2004). Urban flooding on the other land 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, refused and eroded soil sediments (Fulorushand Ologunorisa, 2004) in spite of series of recommendation from research and government efforts at mitigating the menace urban flooding has become a perennial event in most Nigeria cities.

The flooding was attributed to the occurrences of high rainfalls over a period of days in the catchment (Jimoh, and Ayodaji, 2003). Flooding is virtually displacing desertification in northern Nigeria as some state in the north who hitherto were desert threatened now suffer serious flood calamites(Nigeria tribune 1999) it was also reported that the occurrence of flood in both Kano, and Adamawa, state led to the submergence of a whole town and washing away of both crops and livestock,(terra daily 2004). It was also reported in daily trust paper on 28 July 2020 flood that occurred in Sokoto, Kebbi, Zamfara and in Kafanchan first week of August causes havoc to lives and properties. Also in daily trust news paper on 8$^{th}$ August 2022 reported flood in Sokoko state which killed about 50 people and properties destroyed and on 19$^{th}$ August 2022, properties and house destroyed in Yobe state (Daily Trust, 2022).

Flood not only damage properties and endanger the lives of human and animals but have other negative effects on the environment and aquatic life these include soil erosion, sediment deposition downstream and destruction of spawning grounds for fish and other wildlife habitat (Ibrahim, Manta, Isiguzo, and Ahaneku, 2009).On the other hand flood helps spread organic material, nutrients and sediments which enrich floodplain soils, they also replenish water resources and trigger life processes such as bird breeding events, migration and seed dispersal in flora and fauna adapted to the recycles while good soil moisture can allow crops and pasture to established (Doug, Donald 2019).

The Nigeria daily trust (2020) reported incidence in Sokoto, Abuja,kebbi, zamfara,Niger, and Kafanchan, (the study area). Also NAN reports on 5$^{th}$ September,2020 that two persons in lost their lives and 200 houses destroyed in Rogo village while two other persons and 5,000 houses were destroyed by flood in Danbatta In Kano State. The Nation new paper reports on 7$^{th}$ September that 24 died as flood sweeps Jigewa. These called for a need for flood control coordination between relevant department especially kafanchan, which suffered several incidences of flood. It also clamored for a well articulated flood control policy societal re-orientation on this critical issues.

This study is therefore a future attempt to identify the factors responsibility for flooding in the Kafanchan area of Jema'a local government of kaduna state, Nigeria with a desire to suggest plausible solution to this seemingly intractable problem which has constituted serious menace to likelihoods and environmental equality.

## MATERIALS AND METHOD

### Study Area

The study area is Kafanchan, Kaduna State of Nigeria. It is one of the 13 settlement in Jama'a Local Government Area of Kaduna State. Due to its location as a the gateway to Kaduna State, Kafanchan houses people from northern, southern and eastern parts of the country who engages in commercial activities. The population of the settlement according to the 2006 national population census is 83,092 (national population commission, 2006). The vegetation is grassland with axi-solar topical ferruginoussoil. This had made way for construction of houses markets and other infrastructure. The area is influenced by two climatic seasons namely: dry and wet seasons. Dry season occurs between November to March, and wet season between April to October. Kagoro River and its tributaries drain the northern part of the town which is densely settled. Some of the residential neighborhoods are traversed by Kagoro.

## METHOD OF DATA COLLECTION

Four neighborhoods in this settlement that annually experience critical blooding were used for analysis in this study. These are Bayan-Loco, Hayin Gada, Ungwan Musa and Jagindi road.The research population for this study are households and buildings in the flood prone areas of the settlement. The total number of building identified to be flood prone in the area are 820. These structures were identify by walking house to house. out of the total population of 820 structures affected, a 20% sample was taken using purposive random sampling technique. As a result of this, 164 questionnaires were administered to 164 households. It is imperative to emphasize that the population figure of this settlement was not disaggregated by the national population commission. Thus, this study assumed equal population for each neighborhood.

**Table 1: Distribution of Sampled Respondents**

| S/N | Settlement | No. of building | N0 of Questionnaires Administered | Response rate % |
|---|---|---|---|---|
| 1 | Bayan Loco | 197 | 41 | 23 |
| 2 | Hayin Gada | 205 | 43 | 24 |
| 3 | Ungwan Musa | 230 | 45 | 25 |
| 4 | Jagindi Road | 188 | 35 | 28 |
| | Total | 820 | 164 | 100 |

*Source: Field Survey 2022

## METHOD OF DATA ANALYSIS

The research made use of simple descriptive statistics to analyzed data retrieved. This was done using mean percentage scores. Results are presented using tables,Piechat and Ogive

## RESULT AND DISCUSSION

Table1 Socio-Demographic, Characteristic of Households In Kafanchan Jama'a Local Government Area Socio-Demographic Characteristic of Household

| S/N | Variable | Classes | Response | Percentage |
|---|---|---|---|---|
| 1. | Age | 25-34 | 31 | 19 |
| | | 35-44 | 40 | 24 |
| | | 45-54 | 42 | 26 |
| | | 55 and above | 51 | 31 |
| 2. | Gender | Male | 95 | 58 |
| | | Female | 69 | 42 |
| 3. | Educational status | Primary | 39 | 24 |
| | | Secondary | 40 | 24 |
| | | Tertiary Education | 55 | 34 |
| | | No formal education | 30 | 18 |
| 4. | Occupation | Farmer | 40 | 24 |
| | | Artisan | 10 | 7 |
| | | Unemployed | 30 | 18 |
| | | Civil servant | 54 | 33 |
| | | Manufacture | 30 | 18 |
| 5. | Land tenure or house | owner | 66 | 40 |
| | | Tenant | 50 | 31 |
| | | Laborer | 30 | 18 |
| | | Communal | 18 | 11 |
| 6. | Location | Bayan Loco | 52 | 32 |
| | | Hayen Gada | 51 | 31 |
| | | Ungwan Musa | 41 | 25 |
| | | Jagindi Road | 20 | 12 |
| 7. | Time stayed in the area | 4-6yrs | 20 | 12 |
| | | 7-9yrs | 41 | 25 |
| | | 10-12yrs | 50 | 31 |
| | | 13 and above yrs | 53 | 32 |

***Source: Filed work 2022***

The result of analysis for socio demographic characteristic of household in Jama'a LGA is presented on table 1.The results on the table one shows that majority of houses hold (31%) are within the age of 55 and above. This implied that with the level of their age they may have experience several occurrence of flooding in the area as reported by Nigeria punch (2020).In the same way, 58% of household are male.This male dominance seems to relate to migration issue since Kafanchanis a commercial centre which attracts people from different part of the country. Further analysis of the educational status of households shows that (35%) have high level of education.This means that they must have the knowledge on the causes and how to control flooding in the study area (Folorushoand Ologunolisa, 2004) the houses holds in the study area

belong to different occupation profession but are all affected by flooding.Table 1 also reveals that majority of houses (40%) belong to the owners, follow by 31% household are tenants. But the question on why these household are still staying in the area goes with the opinion of ChioeReichel (2018) which said that many household suggesting non geographical factors such as confidence in the ability to adapt and continue habitation in such location, values and other qualitative personal factors play a large role. Furthermore, on the location of the households, the table 1 shows that majority of households 32% are in Bayan Loco 31%in HayenGada25% in Ungwan Musa while 12% are in Jagindi Road.Also the questions were asked on how long the households stayed in the area and the resulted shows that majority houses holds (32%) staying in the area for 13 years and above when they were interviewed. period which shows some high degree of stability (Ologunorisa, 2006).

In table 2, question was asked if the households are aware of the flood in the study area, about 87%household aware of the flood, while 13% are not. Also question was asked if the households had ever experience flooding in the locality, about 98% of the households experience flooding in the area when they were interviewed. This question was asked in order to ensure that those interviewed had experience flooding in the area and so have valid information on the perception and knowledge of the range of adjustment sought by the study (Ologunorisa 2006).

Data from table 2 shows that flood occurs in the month of July and August with July having 49% while august is 43%., Households that responded to that. This also coincides with the peak or rainy season in the study area when there is water surplus due to heavy rainfall or long duration.

**Table Two Awareness of Flood In Kafanchan Jama'a LGA**

| S/N | Variable | Classes | Responses | Percentage |
|---|---|---|---|---|
| 1. | Are you aware of flood? | Yes | 42 | 87 |
| | | No | 22 | 13 |
| 2. | Have you experience flood? | Yes | 160 | 98 |
| | | No | 4 | 2 |
| 3. | Month of occurrence of flood | June | 2 | 1 |
| | | July | 80 | 49 |
| | | August | 70 | 43 |
| | | September | 12 | 7 |
| 4. | Do you aware of flood moving to the area | Yes | 85 | 52 |
| | | No | 79 | 48 |
| 5. | Why do you continue to live here despite the flood problem | Accommodation problem | 52 | 32 |
| | | Near to place of work | 27 | 16 |
| | | personal family reasons | 30 | 18 |
| | | Born in the area | 55 | 34 |

***Source: Filed work 2022***

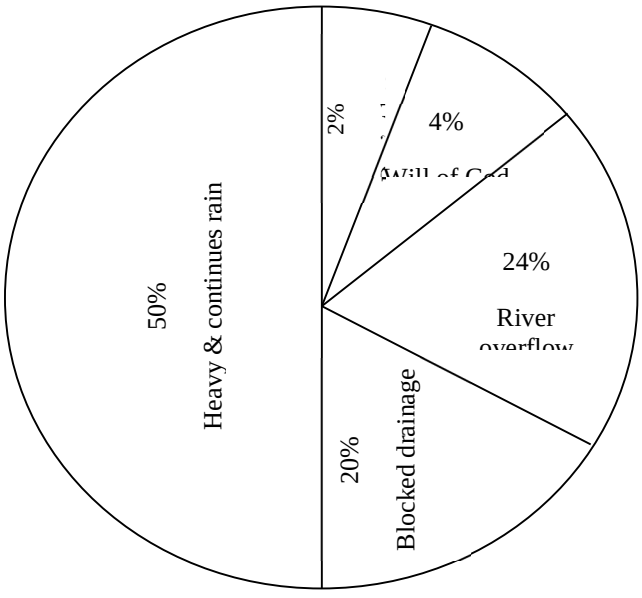
In term of knowledge of flood hazard before moving into the area of residence 52% of households were aware at the time of the interview that the area they live in or farm on was subject to flooding. It would rather seen that for the majority of households, the flood hazard is either of litter significance or is sufficient to force them to consider alternative.This go with the opinion of Chloe Reichel(2018) whose said that households always have confidence in the ability to adapt and continue habitation in such location.when the households were asked the reason for their continued stay in the area despite the flood risk responses (see table 2) show that about 34% of households were born in the area and so probably have no alternativeand 34% have accommodation problem and 18% have personal and family reasons.It should be stated that most of the houses in the area are low cost housing which many residents are able to afford because of the expensive nature of accommodation somewhere (Ologunorisa2006).

Opinion regarding the causes of flooding indicates fairly wide variation in the household perception of the nature of the hazard (table 3) the table shows that 56% of the households recognized heavy and or continues rainfall as the major causes of flooding, this is followed by river overflows (24%) especially the distributaries of river Kagoro.

This finding agreed with the works of Folorushoand Awosika2001, Ologunorisa, 2004. On the whole, a fairly large number of the households demonstrate some understanding of the causes of flooding. Contributory factors such as heavy and continuous rain as agreed by 50% of as well as 24% are with the opinion that flood is cause by river overflow while blocked drainage by dumped refuse were motioned by 20% of households, and surprisingly, only 4% of households considered that floods in Kafanchanis due to the ‘will of God’.

Many of the households interviewed have perception of the frequency of Sever floods. Table 3 show that 63% are with the perception that flood occurs two times a month. This may somehow relate to age of the households as in having the knowledge of flood and what constitutes ‘flood’. 18% selected the option 3-4 times a month. While 10% selected the option 5-6 times a month and 9% don’t know.

**Causes of flood in Kafanchan Jama’a Local Government:**



**Field work 2022**

**Table 3: frequency of the occurrence of flood and how long it last in KafanchanJema'a LGA**

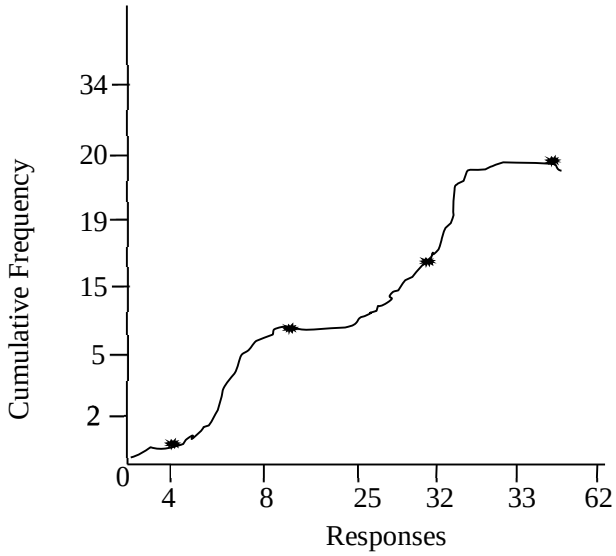
| S/N | Variables | Classes | Response | Percentage |
|---|---|---|---|---|
| 1. | Frequency of the occurrence of flooding | 0-2 time a month | 103 | 63 |
| | | 3-4 time a month | 30 | 18 |
| | | 5-6 time a month | 16 | 10 |
| | | Don't know | 15 | 9 |
| | | 5-9 hours | 53 | 24 |
| 2. | How long the flood last | 10-14 hours | 52 | 32 |
| | | One day | 52 | 32 |
| | | Two days | 19 | 12 |
| 3. | Do you received any assistancefrom government, Voluntary organization or friends and relative? | Yes | 4 | 3 |
| | | No | 160 | 97 |

***Source: Filedwork 2022***

In terms of the time taken for flood to last, results shows that flood last for a long time. In fact, 32% of households observed that flood last for one day while another 32% also observe 10-14 hours. Also about 24% indicate that flood last for 5-9 hours and 12% said it last for two days. This implies that households in the study area have the knowledge and have been observing the flood.

Most of the victim of flood disaster do not receive any form of relief for the loses they suffer from flooding. About 97% indicate that they have never received any form at financial assistance during flood. When asked whom or where they could go for help in recovering from losses, result shows that 3% of the households indicate that very few people affected by flood ever get any help. This little assistance comes mainly from friends and relative.

**Table 4 Devastating and Positive Effects of Floods in Kafanchan Jama'a LGA**




***Source: Filed work 2022s***

Table 4 is on general effect of flooding in the study area. In term of loss of valuables to flooding, about 39% lost their farms, food and cash crops. When also asked of others losses due to flooding, 24% indicate lost of animal life and properties, while 10% mentioned damage and destroy building. In term of causes disease and destroying human life, the effect is low as only 6% indicated they suffered from that. The environment in Kafanchanis somehow degraded since only 6% of households attested to that. This implies that flood is a very serious problem that deserves urgent attention especially in it study area (Nwigweand Bmbeage, 2014).

It is quite interesting that some households (64%) observed that flooding lead to fertile alluvial flood-plain that is good for agricultural production, while in term of fishing, 32% observed that flooding leads to increase in fish catch. This goes with the opinion of Doug Donald 2019. It is also show that the study area is not for recreation and generate hydro-elective power as only 3% of household mentioned recreation, and 1% indicated hydro-electric power.

**Table 5 Adjustments To Flood Problems In Kafanchan Jama'a Local Government Area**

| S/N | Variables | Classes | Response | Frequency |
|---|---|---|---|---|
| 1. | Adjustment | Resettlements | 8 | 5 |
| | | Monetary compensation | 25 | 15 |
| | | Constriction of more drainage | 32 | 19 |
| | | Improve channel | 33 | 20 |
| | | Embankment | 62 | 39 |
| | | Storm reservoirs | 4 | 2 |

***Source: Filed work 2022***

Table 5 summarizes the range of adjustment to flood events by household in kafanchan area. About 39% of households mentioned construction of embankment to reduce flooding, 20% mentioned improve channel and 10% are with the opinion of construction of more drainage. In the same vent, 15% indicated monetary compensation when ever flood occurs, while 5% observed resettlement while 2% are with the view of storm reservoirs. This adjustment mentioned by the household is in line with the finding by (Magami, Yahaya, and Mohammed 2014).

## Conclusion and Recommendation

The research has identified the various causes of flooding and its devastating effects on life and prosperities, building and the environment as well as positive effects such as fertile alluvial floodplain that is deposited after flooding and fishing activities in Kafanchan, Jema'a Local Government of Kaduna state. Investigation revealed that flooding in the area is largely due to heavy and a continues rainfall as well as rivers overflow and blocked drainage by dumped refuse as a result of poor waste management.

In order to minimize flood hazard, stringent flood control measure are necessary in this area since it is becoming a densely urbanized area.
Construction of embankment and over protective channel and the provision of a good drainage could be a way out. In addition, construction of storm reservoirs along Kafanchan River could be a plausible strategy at reducing excess water.
Finally, there is the need to monitor the various urban expansion and flood incidences within Kaduna Mega city. A flood early warning signalsystem with the capability to deliver reliable timely and effective flood

information at an appropriate response time should be installed. It is suggested that the system option must involve integration of global navigation satellite system (GNSS) technology into geographical information system (GIS) framework towards appropriate flood modeling, simulation and forecasting. This will ease service information provision on real time flood risk analysis, flood extend, acceptable risk level modeling and mapping and potential damages and alerts.

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