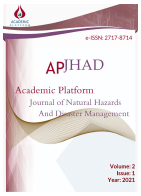

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Evaluation Of Community Preparedness On Flood Management; A Public Survey In Kano Metropolitan

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Abstract

Flooding is one of the frequent natural/human-induced phenomena, which occurred annually for decades in Nigeria. This disaster claimed several lives and properties worth more than N6,120 Bn (which is close to the 2016 budget of the country, Nigeria). Flooding usually occurs in Kano because of lack of community participation, blockage of water drainage as well as lack of law enforcement to force people living in prone areas to vacate. The focus group discussion (FGD) was employed as a tool for data collection. The sampling frame is all district-heads, (Local Government Emergency Management agency) LEMA representatives, and other stakeholders in each local government area. The purposive-sampling technique was adopted in selecting the respondents. It is found that the majority of the respondents believed that climate change is one of the causes of flooding. Others include lack of urban planning, indiscriminate dumping of refuse in the drainage, lack of community participation, etc. Some of the responses made by the respondents about their preparedness are after flooding took place. Some of the recommendations made by this paper include non-structural responses, which include more accurate flood forecasting through the use of satellites, high-tech equipment, zoning and land-use policies, insurance programs, evacuation planning, and public enlightenment programs to sensitize people on the consequences of flooding.

Key words: Kano Metropolitan, flooding response, mitigation, recovery

1. Introduction

Disaster is the effect of a hazard on society, usually as an event that occurs over a limited time span in a particular geographic area. The term disaster is used when the interaction between humans and a natural process results in significant damage of properties, injuries, or loss of life. A catastrophe, simply put, is a massive disaster, requiring the significant expenditure of time and money for recovery [1].

Flood disaster is the commonest and frequent environmental problem in the world today [2]. It is recorded that in 2012 alone flooding caused a loss of a significant amount of money which exceeded $19.6 billion, destroyed more than 590,000 houses, and claimed the lives of more than 360 people Nigeria emergency management agency [3]. This common environmental problem, but hazardous causes psycho-environmental as well as socio-economic effects to the people been affected by it. Mammoth of billion US dollars were lost via aftermaths of flooding through washed off farmland, devastating homes, and so on. It also spread waterborne and

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vector diseases, physical injuries and death. Loss of relationship or neighborhood and many people lost their homes [4], [5].

For the African continent, flooding caused a loss of property worth about US$832 million in 2012 alone. Nigeria experiences different types of flooding; fluvial and coastal due to the nature of its location [6]. A devastating flood was recorded in Ibadan city when Nigeria became Republic in 1963, where the River Ogunpa flood claimed many lives and properties [7]. As the most populous country in Africa, in 2012, Nigeria recorded the worst flooding, which never experienced in the last four decades affected almost all the states particularly the northern part of the country because heavy rainfall lasted for many days. This affected more than 7 million people [3]. Kano is one of the states that have been affected by floods badly often [8]. According to the Kano State Relief and Emergency Agency (SREA), at least 5,300 houses were destroys by flood in six Local Government Areas of Kano State in 2016 [9].

It attracts the attention and interest of professionals from different fields of study. Researchers and practitioners look at flooding from a different perspective and take some portion of it to study such as causes, frequencies of occurrence, effects, impacts, and remedies of it. For example in the field of geography they looked at the analysis of vulnerability to flood disaster [10], [11]; research from the field of health, studied the effects of flooding on the heath [12], [13]; Microbiology studies flooding and waterborne and vector disease [4]. Engineers study mostly related technologies intending to create a model or to curb the menace of flooding [7], [14] while researchers from the field of geo-informatics focus more on mapping and modeling flood risk areas [15], [16]. Economists heed their attention on monetary effects of flooding [8], [17].

In the Nigerian context, flooding is categorized based on the location of its occurrence and the effects put on the nearby people. The urban and rural areas experience flooding mostly occur due to heavy downpour, coastal flooding (which occurs in a coastal area and affects most coastal areas) and the last is fluvial flooding (which occurs as a result of an overflow of a river due to breaking or overtopping natural or manmade barriers) [9].

It is a tradition of people to wait for government in some aspects that can easily manage and control by the community. The same people will bear the consequences first and victimizing their lives. People do not want to spend their money, time or energy on issues that matter to them. This is what makes people have an ‘I don’t care attitude’ or concrete plan and get ready against conditions or situations that have a potential impact on causing harm, injury, diseases, or loss of life during a disaster.

Urbanization is also a factor that might lead to flooding in some areas of the municipality. As soon as the human being starts to congregate even in small villages, certain practices are set in motion that enlarges the settlement into towns, cities, metropolises, conurbations, etc. Therefore, such practice is the construction of concrete structures and the creation of impervious surfaces that reduce the infiltration capacity of city-landscapes to virtually zero percent [18].

Rainfall varies in intensity and duration, and so does the volume of rainwater that runs across the land. When rain is heavy, floods can result. No matter where you live – be it the tropics, the plains, the desert – floods occur. Within a human lifetime, everyone will have a flood pass near him or her. Within small drainage basins, brief, localized downpours can cause fast-moving but a short-lasting maximum flood. Everyone living near a stream needs to understand the frequency with which floods occur. Small floods happen every year or so. Large floods return

less often – every score of years, century, or longer. Statistically speaking, the larger the floods, the longer is the recurrence times between each.

Human-induced flooding is the key figure in causing flooding in urban centers. An increase in population in an area especially a smaller one (urban) can make people erect buildings close to or on culverts or drainage systems. Apart from the increase in population, the lackadaisical behavior of government especially in developing countries causes and exacerbates the problem and has been regarded as a major creator of urban flood risk [19].

The research aimed to examine the human activity on the wise use of the environment and his readiness to flood within the metropolitan Kano. Understanding community readiness is important in such a way that people will come to know what they are supposed to do before, during, and after the incidence.

2. Materials and Method

2.1 Study Area

Kano Metropolis lies between Latitude 11^0 25'N and 12^o47'N and Longitude 08^0 22'E and 08^0 39'E. The Metropolis has eight LGAs i.e. Dala, Fagge, Nassarawa, Gwale, Tarauni, Kano Municipal, Kumbotso and Ungogo and is bordered by Minjibir LGA on the Northeast and Gezawa and Warawa LGA to the East, Dawakin Kudu LGA to the Southeast and Madobi and Tofa to the Southwest. It covers an area of approximately 500km^2 (Figure 1).

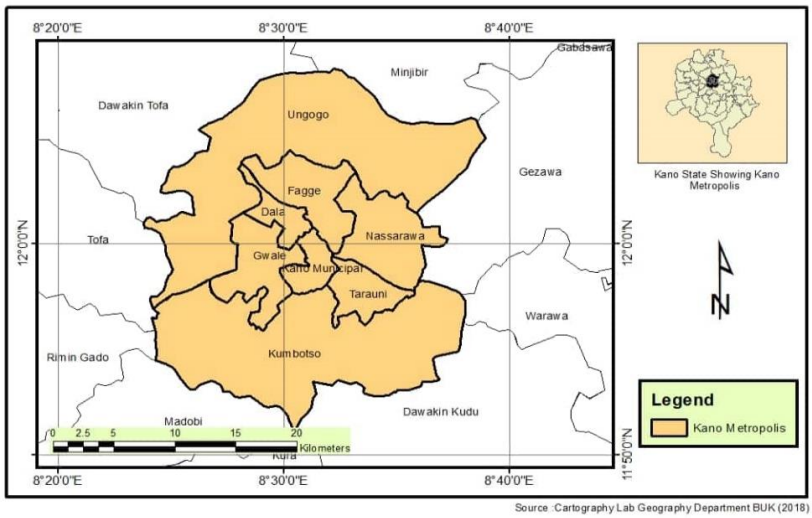

Figure 1. Map of the study area

2.1 Focus Group Discussion (FGD)

This research work employed both primary and secondary sources of data. Focus Group Discussion used as the primary source of data. Eight FGD were conducted; one in each local government area within Kano metropolitan. It consisted of 8-11 persons that include district head, ward councilor, representative of Local government Emergency Management Agency (LEMA), chairperson of community service in the area, trader doing their business at the area and other three to six stakeholders given by the community.

Reconnaissance surveys were made to district heads where flooding ever occurred in his

custody as well as the environmental unit at the local government secretariat. The essence of this visitation was to introduce the topic and asked for gathering at least 8 to 12 people which should include; district-head, LEMA or environmental department representative, ward councilor, trader or business person doing his/her business close to the most affected area, chairman of community service in the area and other stakeholders selected by district-head. The researchers encouraged district heads to put females in their selection, as they are the ones mostly affected by flooding. Fagge, Kumbotso, Ungogo, Nasarawa put two females each in their selection. The phone calls were made within two weeks (9/2/2020 to 23/2/2020). For conducting FGD, the research team took different roles: one acted as note taker (and used recorder for recording), one acted as moderator while the other one was the observer of the general mood and body language of the participants. FGD have started between 10:05am to 11:37am (1/3/2020); 10:09 to 11:25am (2/3/2020); 5:32pm to 6:25pm (2/3/2020); 4:15pm to 5:28pm (5/3/2020); 10:02 to 11:34 am (6/3/2020); 11:00am to 12:35pm (10/3/2020); 11:10am to 12:13pm (11/3/2020); and between 2:58pm to 3:59pm in Gwale, Kano Municipal, Dala, Fagge, Tarauni, Kumbotso, Ungogo and Nasarawa respectively. For the analysis, FGDs were coded alphabetically; starting Dala and ended in Ungogo local government areas. All the FGDs took place at the district head's offices. There is mutual understanding between the research team and participants which makes the respondents answer questions freely both males and females, as they were sitting together.

The main reason for employing FGD in this research work is to involve people to explore what is the ground in their locality. On the other hand, secondary sources of literature include published and unpublished literature that is relevant to this research work. Thematic analysis was adopted where responses of the participants in FGDs were divided based on some thematic heading with a few questions under each thematic heading. The thematic headings were categorized into four: the relationship between flooding and NAMA prediction, causes of flooding, relief received from governmental agencies or non-governmental agencies (NGOs), and measures are taken to cope with flooding. The theme was a classified and coded letter to follow the theme of the presentation and compared with the field note taken during the session, views were gathered and interpreted based on the theme. This is because research uses the qualitative approach in analyzing data generated from FGDs. However, lessons from the aforementioned literature and theoretical frameworks together with the same experience used in developing questions under four major thematic categories.

Results and Discussion

The data collected through FGD, recordings were transcribed and coded based on three thematic headings. All long descriptions were discarded and focused mainly on the theme. The followings are the results of the discussions with focus groups.

There is unanimous agreement among all FDGs that climate change is among the causative agents of flooding in their areas. They responded by saying that in previous years they used to predict the amount of rainfall to be received based on the winter season, but now they cannot predict, as reported directly from the response of FGD in the Kumbotso local government area.

> *We used to predict the duration of the month we would receive rainfall based on the winter season. Because there is a correlation between the winter season and the rainy season in terms of length of months experience in the two seasons. Mostly, our winter season starts from November to February; that is four months. The same with rainy season is four months: May to September; but now we cannot predict due to fluctuation*

of winter and rainy season caused by climate change.- FGD 5

Based on the finding of this research 75% of the respondents do not know the function of NAMA in predicting the amount of rain falling in an area. What they believe is that media stations broadcast weather forecasts mostly by them. However, even the forecast made by media stations on the amount of rain falling in a year is only 40 – 50% happen. For that, they do not believe media stations play a critical role in minimizing flooding. This negates the finding of Aderogba [17] which stated that media station in Nigerian media has been applauded by furnishing qualitative information regarding the widespread flooding in Nigeria. Only two local government areas (Fagge and Kumbotso) agreed that mostly they depend on NAMA on the amount of rain received every year through media stations.

While responding to questions on causes of flooding in their areas, it is stated by the respondents that, poor urban planning causes most of the flooding in Dala, Kano Municipal Nasarawa and Fagge local government areas. That is to say, there is poor urban planning not only in old Kano city but rather outside Kano city wall such as Dandinshe, Bridget, Fagge, Kurna. As one of FGD (Dala local government area) stated:

> *Akwai karancin tsarin layuka a wannan karamar hukumar saboda tsofaffin unguwannin da suke wannan local government. Wannan shi ne babban abin da yake jawo ambaliyar ruwa a wannan karamar hukumar kusan kowacce shekara. (There is a lack of urban planning in our own local government due to the old quarters it consists of. This is the main cause of flooding in this local government almost every year). - FGD 1*

This result is the same as what is in Fagge, Kano Municipal, Gwale and some parts of Nasarawa Ungogo. It is the same finding recorded in the work of Agbonkhese *et al.* [2] which found out poor urban planning causes most of the urban flooding in Nigeria.

Another cause of flooding mentioned by FGD in Kumbotso, Tarauni and Ungogo local government is that there is a lack of communal spirit:

> *Most people do not have a communal spirit. This means that most people engage in community activities are done if the environmental problem will affect their own dwelling. And at the same time, they have a misconception about the concept of 'environment'. People think that only their house is their environment. This makes them show 'I do not care' behavior. - FGD 7*

This lack of communal spirit recorded by some FGDs negates the finding of Vis et al. [20], which recorded that each person pays hundreds of Euros each year and takes the responsibility of flooding management as they have a communal spirit.

In Gwale, Fagge, Tarauni, Ungogo and Nasarawa FGDs there is a poor organization of community self-help groups. Almost all the community self-help groups are poorly organized. They only meet if there is an environmental hazard. They do not, most of the time, take preventive measures for flooding problems. They only organized after the first or second heavy rainfall. This poorly organized community self-help group leading them not even attempt to talk to the authority about what will be done to them before, during, and after flooding (if happened). This corroborates with the findings of Obeta [21] which indicated that stakeholders and community are poorly organized in tackling environmental hazards and take the hazard as momentary.

All FGDs discussed within Kano metropolitan local government unanimously agreed that there are inadequate tools to evacuate all refuse dumped at drainage such as containers, rain boots, shovels, wheelbarrows, hand gloves, rake, etc. this is a result of their poorly organization. According to some respondents in Dala, KMC, Ungogo, and Gwale identified that:

> *We have few instruments to clear our own gutters and culverts before the month of rain starts. Moreover, sometimes, the few instruments we have are always lost through borrowing from a member of that community as they are feeling they put their own share in purchasing these tools. - FGD 3*

According to all the respondents in all the study areas the major cause of the flooding is not climate change but rather a poor drainage and culverts. This according to them people erect structures in haphazardly except some parts of the Gwammaja ward. This is contrary to the finding of Agbonkhese *et al.* [2], which found out that climate change is among the causes of flooding in Nigeria.

On the people side, arbitrary dumping of refuse in waterways especially during the rainy season is among the causative agent of flooding. Respondents from Adakawa, Mazugal (Dala local government area), Diso, Mandawari (Gwale Local government area), Kurna and Fagge (Fagge local government area) dump their refuse in the waterways during the rainy season. This corroborated the result of [2], [22], which found out that a poor refuse disposal system is among the key causes of flooding in Borno.

The absence of dumping sites by the authority in most of the locality is a major reason because most of the respondents have the intention to dump their refuse in the designated area provided by the government. Nevertheless, unfortunately, local government provides little in some areas such as Ungogo, Mazugal.

Inadequate preparedness is considered by many respondents as the major cause of urban flooding in the Kano metropolitan. Contrary to what was used to practice to evacuate and clear all culvert and drainage before the rain starts falling. In line with this, Agbonkhese *et al.*, [2] identified poor preparation for the rainy season as among the factors that determine the flooding in Nigeria.

3.1 Relief (Assistance)

There is no relief received by our people during or after flooding by Non-governmental Organizations (NGOs) in all local government areas. For example, in the 2012-2020 floodings, no palliative given by NGOs received by victims or affected people in our local government areas. Non-governmental Organizations do not give anything economic support, but rather from our relatives and neighbors. To emphasize their view, here it is FGD result from Nasarawa local government which is almost the same as other local government areas within Kano metropolitan:

> *We do not receive any relief from any non-governmental organizations, but rather from our relatives and neighbors who provided clothes, food, mosquito nets, and sometimes money. We do not know if these NGOs give financial support to authorities like local governments. - FGD 6*

There is seldom give out palliative from the government, but there is discrimination in the distribution of such kinds of palliatives due to differences in political views as FGDs in Dala, Gwale, Kumbotso and Ungogo. This reported from FGD in Dala:

> *We receive some relief from the government after flooding depending upon the influence of your ward on the incumbent government especially we in Dala local government as you can compare with those in Kano Municipal where they receive full government support since they participate more in politics. - FGD 1*

This view is supported by all FGDs in Kano metropolitan, though there are differences in terms of the amount of support received from their relatives and neighbors. Those in Kumbotso, Kano Municipal, Fagge and Dala receive higher relief than those in the rest of the local government areas.

3.2 Measures/Disaster management plan

The disaster management plan includes a detail of the specification of equipment and machinery in plan. Similarly, planning is the plot, and hazardous areas classifications are map out; details of the risk assessment procedure adopted are also captured. Additionally, details of the on-site and off-site emergency plans are also required in the disaster management plan (Galatchi, 2005). As flooding is the most common disaster Nigeria experiences, Disaster Management Plan was used to see how preparedness the respondents are. Four stage disaster management cycle was used to see how people cope with the plan. These four stages are: preparedness, response, recovery, and mitigation.

3.2.1 Preparedness

This refers to the degree of alertness and readiness of an individual, a household, or a community against an upcoming disaster. Among many activities taken include providing hazard warnings, communicating with the public and others regarding disaster vulnerability, providing disaster training for emergency responders and the general public, just mentioned a few (Tierneyet, 2001). Almost all the measures taken are during or after flooding except in Dala, Kano Municipals, Gwale, Fagge and some parts of Nasarawa local government. The measures taking as mention by FGDs in clearing gutters and culvert a month before rain start. Tools such as a rake, shovel, hoe, and wheelbarrow provided together with food for the people to do such work. Nowadays, people liaise with REMASAB at the local government level to evacuate refused piled up along the gutter side.

3.2.2 Response

The response is referred to all activities conducted immediately before, during and after a disaster to save lives, minimize damage to property, and enhance the effectiveness of recovery in the shortest possible time [23]. Based on the result of FGDs all the FGDs identified that they participate hundred percent during flooding in rescuing and removing flooded water from entering rooms. One of the FGD in KMC quoted that:

> *Even if we did not prepare for flooding, when it happened, we do our best to rescue people and their properties; because everyone wishes to help. We sometimes create a path where flooded water can pass. - FGD 4*

3.2.3 Recovery

Recovery is a process of returning to a normal situation before disaster happen after a disaster has occurred. In this phase mostly increase in safety and future disaster preparedness are taken place here. This process includes interactive sessions and decision-making among different groups and institutions (both governmental agencies and NGOs), households, artisans, businesspersons, and the community at large [23]. Most of the urban flooding claims properties than lives.

The result of all FGDs indicated that there is no recovery phase taken by the community. They only focus on what happened. But there is one divergence in the opinion of FGD in Gwale and other FGDs. In the Gwale it is recorded that:

> *Immediately when flooding has taken place, we gather in our own community and discuss how to prevent such a disaster from the occurrence. However, this gathering is base on economic class. Within Gwale local government, rich men are gathering without inviting poor people or even district-head while in other areas only poor people struggle for taken recovery measures. Both rich and poor people leave their decision unimplemented up to the next rainy season. - FGD 3*

3.2.4 Mitigation

Mitigation activities actually eradicate or reduce the probability of disaster occurrence, or reduce the effects of unavoidable disasters. Mitigation measures include building codes; zoning and land use management; building use regulations and safety codes; preventive health care; public education, and so on. This phase is absent as reported by all FGDs:

> *This is the government's responsibility to make urban and regional planning, providing healthcare facilities, enforce the use of building regulation. - FGD 8.*

4. Conclusion and recommendation

This research identified that the functions of the National Emergency Management Agency (NEMA) were not known to the majority of people and the major causes of flooding such as lackadaisical behavior of people, lack of communal spirit, dumping of refuse in the gutter and culvert. The research work also showcased the relief when flooding occurred government and NGOs do not go to the hand of affected people if it is given. Based on the finding of this research work, the research recommended that Non-structural responses which include more accurate flood forecasting through the use of satellites and high-tech equipment, zoning and land-use policies, insurance programs, evacuation planning, and education should be adopted.

Authors Contribution

Ahmad Said Abubakar and Umar Abba design the topic and made literature survey on the subject matter. Nura Isyaku Bello, Abdulkadir Bello and Hassan Adamu partake fully in the course of data collection across the study area. All the authors contributed to the analysis of the data.

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