RESCUE AND RECOVERY MEASURES DURING FLOOD DISASTER IN LAPAI L.G.A OF NIGER STATE, USING KUCHI/EBBO AS A CASE STUDY

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ABSTRACT

In recent decades, flood disaster has been occurring frequently in Kuchi/Ebbo in Lapai Local Government Area of Niger State. The Niger River Basin, Gurara and Shiroro river has not been spared the flood hazard that is threatening human security in the area. Those living in flood affected areas face the risk of severe damage to their infrastructure, the loss of their livelihood as well as a substantial threat of injury and death. These hazards can hamper efforts to escape poverty and set back development gains. Despite the threat, there is very scant research documenting in respect of rescue and recovery measures during flood disaster In Lapai L.G.A of Niger state, using Kuchi/Ebbo as a case study. The study addresses the rescue and recovery measures during flood disaster in Kuchi/Ebbo Lapai Local Government Area of Niger State. A survey research method was adopted. Both qualitative and quantitative data collection methods were used. Collection of quantitative data was through oral interview and non-participant observation while quantitative data was collected using unstructured questionnaire and secondary sources such as books and journal articles. The flood assessment shows that the low lying areas that border river Kuchi bed streams and their tributaries are highly affected by the hazardous flood events except for some parts of the areas in Ebbo. Most of the people living in Kuchi/ Ebbo are highly vulnerable to flood hazard. The assessment reveals that the municipality of the Kuchi/ Ebbo is more vulnerable than the municipality of Ebbo inner town.

Keywords: Rescue, Recovery, Flood Disaster, Lapai, Niger State, Kuchi/Ebbo.

INTRODUCTION

Floods remain one of the major causes of natural disasters affecting society. In a study of major natural hazard (excluding droughts) on a world-wide scale over the period 1947 to 1967 Sheehan & Hewitt (1969) ranked floods first out of sixteen natural disaster types responsible for either $1 million damage or at least 100 persons killed or injured. Although floods accounted for about 30 percent of all natural disaster and 40 percent of the fatalities Sheehan & Hewitt (1969) In addition, data from the statistics of past disaster in the world show that floods and droughts account for 54percent of the significant damages, 65 per cent of the persons affecting and 29 percent of deaths DHA, (1994). It is well recognised, however, that the majority of all deaths and damage from tropical storms is the result of flooding DHA (1994). However, like many other

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natural hazards, flood may also bring benefits, such as the recharge of ground water Abdulrahman (2016) and deposition of silty materials quite useful for agricultural purposes. Since man is unable to control the basic atmospheric processes which produce most floods. He has attempted to adjust to the hazard by means of floods. He has attempted to adjust to the hazard by means of flood alleviation projects concerned with land- based phase of the hydrologic cycle. Through the application of high technology and the massive investment of capital, the flood threat to human life has decreased appreciably in most developed countries within recent decades.

Flood alone is a hazard but when it affects man and his properties or activities, it is called a disaster NEMA (2012). Flood is a disaster because it results in: loss of lives, loss of agricultural products, loss of soil fertility for agriculture, and renders many homeless, destroys livestock and other valuable assets while causing cholera and other health related problems Ghosh (1971) and Umar (2017). Floods by nature are complex events caused by a range of human vulnerabilities, inappropriate development planning and climate variability Ghosh (1971). Flood can be predicted to a reasonable extent, with the exception of flash flood, whose scale and nature are often less certain (Umar & Ugwu, 2019). Over the past decades, the pattern of floods across all continents has been changing, becoming more frequent, intense and unpredictable for local communities, particularly as issues of development and poverty have led more people to live in areas vulnerable to flooding.

The impact of flooding and erosion in some parts of the Nigerian coast has been treated extensively by Umar (2020). Umar observed that there have been destruction of beaches, infrastructure such as roads, electricity connections and drainage systems; disruption of commercial and beach activities, Umar (2020) noted that flooding, in particular, has led to the destruction of houses and prevention of free flow of traffic in Kuchi/Ebbo community as show below (Figure 1).

In Kuchi/Ebbo flooding is rated as one of the most important overall environmental hazards because it has greater social effects. Flooding was particularly severe in 1989, 1995, and 1996 and even in 2012 and 2020 forcing thousands of people to seek shelter at higher elevations, leaving crops and houses destroyed. Direct losses from flooding include large areas of valuable land which cannot be cultivated and the destruction of infrastructure and housing. Many of the economic activities in Kuchi/Ebbo including agriculture fisheries would be disrupted (Umar, 2017; Abdulrahman, 2016).

In order to reduce large –scale damage and losses arising from flooding in Kuchi/Ebbo Community, the need to rescue and recovery measures during flood disaster become imperative.

Objective of the Study

The study sought to achieve the following objective:
To examine the activities rendered by Local Communities (Kuchi/Ebbo**)** during response and recovery operations

Research Question

Which types of activities are required to provide quick relief, support and promote reconstruction or recovery efforts by Local Community?

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Sources: Researcher's field survey 2022.

FIGURE 1
DESTRUCTION OF HOUSES AND PREVENTION OF FREE FLOW OF TRAFFIC IN KUCHI/EBBO COMMUNITY

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The Study Area

Niger state with a land area of 74,244sqkm covers about 8.1% of total land area of Nigeria. It lies between latitude $9^0 0^1$ and $10^0 30^1$ North and longitude $4^0 0^1$ and $6^0 0^1$ East. The State shares a common boundary with Sokoto State to the north, Kaduna State and Federal Capital Territory to the East, while on the south by Kogi State and in the west by Kwara State Umar (2017) (Figure 2).

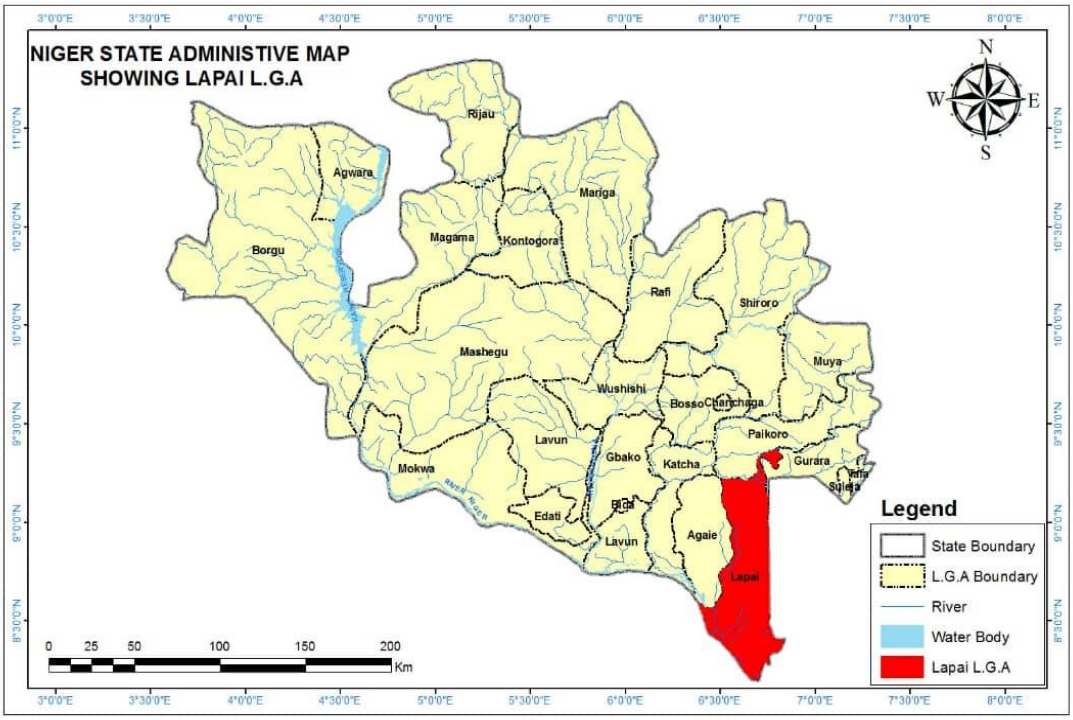

FIGURE 2
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA (2022)

Geographical Location of Lapai

Lapai the study area, lies between latitude $8^0\ 30^1$ and $9^0 0^1$ North of the equator and longitude $6^0\ 30^1$ East of the Greenwich Meridian. The city is Located on the North-Eastern part of Niger State. It is also found in the Guinea Savannah belt. It is characteristic by two seasons, the dry and rainy season (Umar, 2017).

Lapai Local government areas have nine (9) districts which include; Birnin Maza, Lapai, Duma, Gulu Vasta, Gwau, Kpada, Ebbo, Bata and Muye (Figure 3). The climate experience in the town is tropical continental with an average rainfall of 100-150cm which lasts for 5-6 month (Umar et al., 2017).

Socio-Economic Base

Kuchi/Ebbo people are predominantly farmer cultivator such crops as rice, yam, sweet-potatoes and cattle herder. However significantly percentage of the people engages in other

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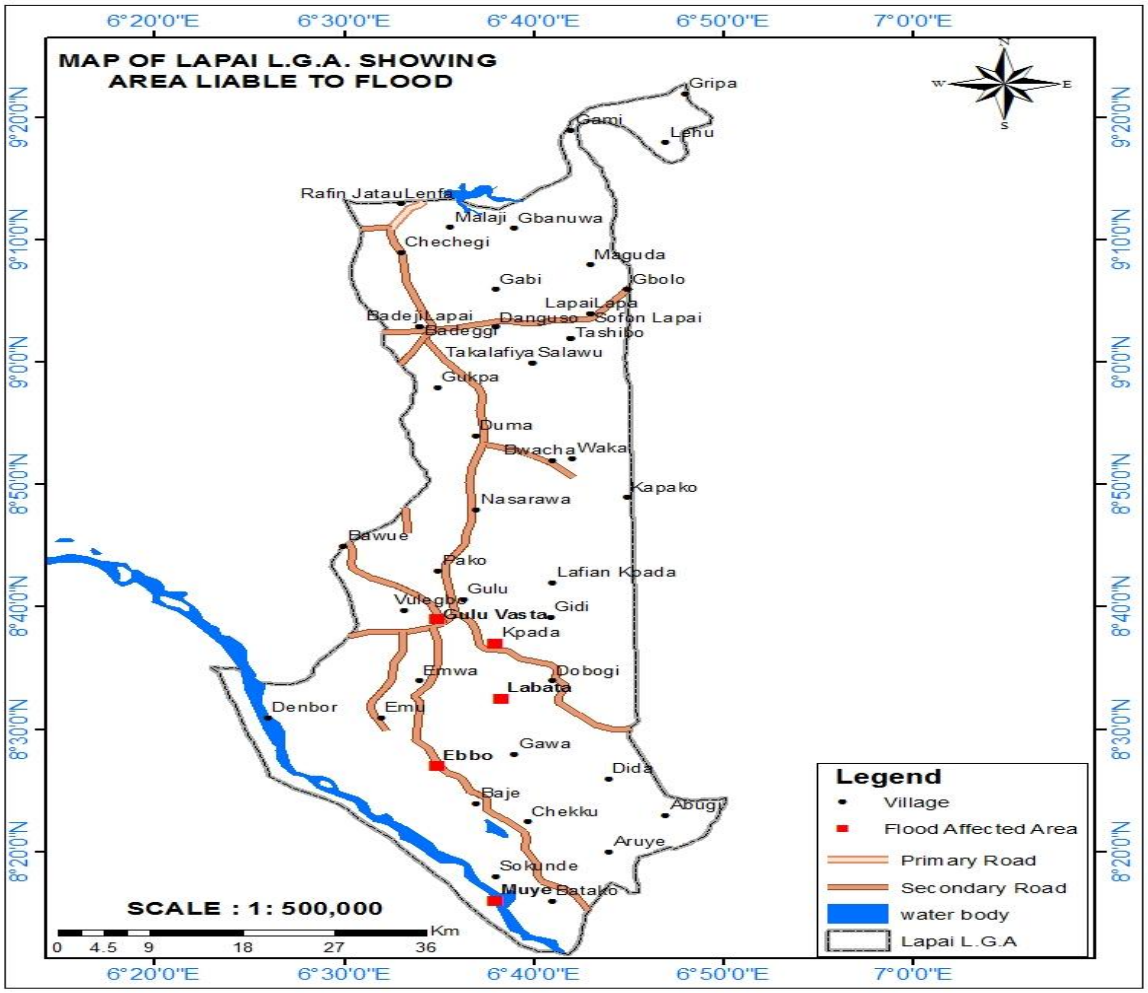
economic activities like trading, vocational pursuit and public service. Some of the people find themselves in public sector work in the state or Local government offices such as ministry of Agriculture, works as well as schools. But since the Establishment of Ibrahim Badamasi Babangida University in 2005, there have attracted a large number worker thereby adding to the numbers of the workforce of those working in the public sector (Umar & Onoh, 2020).



Source: Federal University of Technology, Minna (2022)

FIGURE 3
MAP OF LPI L.G.A. SHOWING AREA LIABLE TO FLOOD

The number of population that are working in private establishment like Nursery and primary school Ebbo, general hospital as well as shops are numerous.

Those that are self employed including the farmers, traders, artisans like goldsmith, blacksmith and the local factor and carpenter, shoe makers, weaving and dying are few (Umar, 2020).

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Geology, Soil and Vegetation

The geology of the study area is made up of cretaceous sandstones deposit. It is characterized by the presence of Lower coal measure in Kuchi/Ebbo. False-bedded sandstones and upper coal measures of the lower paleocene. There is no exposure of bedrock to the surface. It encompasses the false-bedded sandstones and the upper and lower coal measures are subjected to severe gulling (Umar, 2020).

The study area falls within the zone of alluvial soils in Nigeria. It is best described as alkaline black earths and are characterized by dark-brown, almost black strongly structured clay with alkaline to low acidic PH reaction; these soils have low permeability, high- water holding, capacity with moderate amount of soluble salts (Pelling et al., 2004).

The study area falls within the guinea savannah region of Nigeria; this is the broadest vegetation zone in Nigeria, occupying nearly half its area. Grasses dominate the study area. The grasses have durable roots which remain underground after the tops are been burnt away during a dry season fire and sprout again with the onset of the first rains the following year (Jinadu, 2001).

The few available trees grow long taproots and develop thick bark, which enable them to survive the long dry season and resist bush fires. Some of them have curious shapes and a few small leaves. Most of them have umbrella- shape canopies, which not only shade the ground and limit loss of soil moisture, but also present a thin edge to wind. They shed their leaves in the dry season in order to minimize loss of water by transpiration (Jinadu, 2001).

RESEARCH METHOD

Survey research design was adopted. Both qualitative and quantitative data collections were used. Collection of qualitative data was through oral interviews and non-participant observation, while quantitative data were collected using structured questionnaire and secondary sources such as books and journal articles. ^#^$

The oral interview targeted key member of the scheme management team. Interview was conducted based on questions drawn from prepared interview guide and recorded manually. The non-participant observation data were derived using observation schedule and photographic material during several visits made to the site. Due to the constraints, study avoided some residents and visitors to the scheme in the interview schedules for probable need to ascertained and confirm the observed data and inferences.

RESULTS

To examine the activities rendered by Local Communities (Kuchi/Ebbo**)** during response and recovery operations (Tables 1-5).

Table 1
KMO AND BARTLETT'S TEST

Kaiser-Meyer-OIkin Measure of Sampling Adequacy	0.589
Approx chi-Square	303.097
Bartlett's Test of Sphericity	36
Df Sig**.**	0

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Table 2
COMMUNALITIES

	Initial	Extraction
Shelter	1.000	0.542
Food	1.000	0.725
Medicines	1.000	0.639
Psycho social support	1.000	0.559
Employment	1.000	0.588
Financial	1.000	0.593
Skill	1.000	0.563
Transportation	1.000	0.552
Resumption of normal life	1.000	0.469

Table 3
TOTAL VARIANCE EXPLAINED

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.818	20.205	20.205	1.818	20.205	20.205
2	1.269	14.106	34.310	1.269	14.106	34.310
3	1.123	12.480	46.791	1.123	12.480	46.791
4	1.018	11.315	58.105	1.018	11.315	58.105
5	0.924	10.267	68.373	-	-	-
6	0.851	9.458	77.831	-	-	-
7	0.759	8.428	86.259	-	-	-
8	0.702	7.795	94.054	-	-	-
9	0.535	5.946	100.000	-	-	-

Table 4
TOTAL VARIANCE EXPLAINED

Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	1.566	17.403	17.403
2	1.351	15.015	32.418
3	1.179	13.096	45.515
4	1.133	12.591	58.105

Table 5
COMPONENT MATRIX[a]

	Component			
	1	2	3	4
Shelter	-0.153	-0.392	-0.023	0.604
Food	0.071	0.032	0.722	0.445
Medicines	0.396	0.161	-0.52	0.432
Psychosocial support	0.16	0.589	0.431	-0.018
Employment	0.624	0.406	-0.183	0.011
Financial	0.744	0.129	0.136	-0.063
Skill	0.267	-0.479	0.246	-0.448
Transportation	-0.542	0.431	-0.152	-0.221
Resumption of normal life	0.547	-0.38	-0.099	-0.124
Extraction Method: Principal Component Analysis.[a]				
a. 4 components extracted.				

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Activities Involved by the Local Communities during Flood Disasters in Kuchi/Ebbo Lapai Local Government Area of Niger State

The KMO which measures the sampling adequacy (that is if the responses given with the sample are adequate or not) have a value of 0.589 which is higher than 0.5, it is therefore accepted as it indicate that the sampling is adequate for the component analysis. Also, the result showed the Bartlett's test which is another indication of the strength of the relationship among variables. The Bartlett's Test of Sphericity with the value of 0.000 is significant as it is less than 0.05. It implies that correlation matrix is not an identity matrix. The communalities which also shows how much of the variance (i.e. the communality value which should be more than 0.5 to be considered for further analysis, otherwise the variables are to be removed from further steps factor analysis) in the variables has been accounted for by the extracted factors which indicated that 54.2%, 72.5%, 63.9%, 55.9%, 58.8%, 59.3%, 56.3% and 55.2% of the variance in Shelter, Food, Medicine, Psycho, Employment, Financial Skill and Transportation were accounted for respectively. The Eigen value which reflects the number of extracted factors whose sum should be equal to number of items subjected to factor analysis indicated that four factors or components were extracted and the cumulative percentage was 58.1%. This implies that the four factors explained 58.1% of the variance.

The Table 5 above shows the loadings (extracted values of each item under 4 variables) of the nine variables on the four factors extracted. The higher the absolute value of the loading, the more the factor contributes to the variable (Four variables were extracted wherein the 9 items are divided into 4 variables according to most important items which similar responses in component 1 and simultaneously in component 2, 3 and 4). The idea of rotation is to reduce the number factors on which the variables under investigation have high loadings. Looking at the Table 5 above Shelter, Food, Psycho-social support, Employment, financial and Resumption of normal life are substantially loaded on Factor (Component). This indicates the activities that the local community (Kuchi/Ebbo) were actively involved. All the remaining variables are substantially loaded on Factor. Therefore, it is concluded that local communities (Kuchi/Ebbo) were actively involved in the provision of Shelter, Food, Psycho-social support, Employment, financial and Resumption of normal life in flood response and recovery measures during flood disasters in (Kuchi/Ebbo) in Lapai Local Government Area of Niger state.

Recommendations

For planning flood control, measures, it is necessary to have the following inputs which can be obtained by using remote sensing techniques

Flood Inundation Mapping

Surface water bodies can be mapped in Kuchi/Ebbo by adopting the unique recognition characteristics of near infrared spectral hands. Accordingly, the extent of the area inundated by flood can be obtained relatively easily from satellite- based observation. In this case one can adopt both digital and optical data processing techniques as they are helpful in delineating the flooded areas. Based on the information the planning and decision- making authorities of flood control can take decisions with a fair degree of reliability on such aspects as (i) Extent of flood

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damage (ii) Structural measures, (iii) Area requiring post flood alleviative measures and (iv) Providing relief to the affected people.

Secondly Information Regarding Flood Plain Landuse

The Landuse information of the flood prone rivers is very important which is required for planning measures for flood alleviation. This also helps in the assessment of flood damage. On a long term basis such information is also of help in the development of (i) necessary measures to control man's encroachment on the flood plain, and (ii) flood hazard zoning giving due weight age on the varying degrees of flood hazard.

Thirdly indication of flood susceptibility

The natural flood susceptibility indicators are as below (i) characteristics of drainage basin i.e. drainage density, shape etc. (ii) channel configuration and geomorphologic characteristics (iii) soil moisture availability and differences in soil type (iv) Upland physiographic and agricultural development, (v) Landuse boundaries, and (vi) flood alleviation measures and degree of abandonment of levees.

The flood plan indicators can be obtained through application of available air- photo interpretation techniques. Theses parameter is helpful for flood hazard zoning and estimation of inundated areas.

CONCLUSION

This study, aimed at rescue and recovery measures during flood disaster Kuchi/Ebbo came to the conclusion that since almost all of the area's populations settled in flood prone areas, they are likely to be exposed to flood. The flood assessment shows that the low lying areas that border river Kuchi bed streams and their tributaries are highly affected by the hazardous flood events. Except for some parts of the areas in Ebbo most of the people living in Kuchi/ Ebbo are highly vulnerable to flood hazard. The assessment reveals that the municipality of the Kuchi/ Ebbo is more vulnerable than the municipality of Ebbo inner town.

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Received: 28-Jun-2022, Manuscript No. ASMJ-22-12271; **Editor assigned:** 30-Jun-2022, PreQC No. ASMJ-22-12271(PQ); **Reviewed:** 14-Jul-2022, QC No. ASMJ-22-12271; **Revised:** 27-Jul-2022, Manuscript No. ASMJ-22-12271(R); **Published:** 03-Aug-2022

Citation Information: Ibrahim, U.T., Nkeiruka, U.L., Okereke, J., Uchechukwu, E.H., & Ugochchukwu, U.H. (2022). Rescue and recovery measures during flood disaster in Lapai L.G.A of Niger state, using Kuchi/Ebbo as a case study. *Academy of Strategic Management Journal, 21*(5), 1-10.