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# A Study of Common Episodic Disaster Events in Zaria Urban Area, Nigeria

Abdulhamid A. Ibrahim and Ibrahim Jaro Musa
Department of Geography, Ahmadu Bello University Zaria, Kaduna State, Nigeria

**Abstract:** This study is an assessment of common episodic disaster events in greater Zaria area, Nigeria. The primary and secondary methods were used to obtain information for this study. In the primary method the questionnaire was used while the secondary method provided information on the rate of occurrence of some disasters, which was obtained from fire service in Zaria, Sabon Gari, Soba, Zaria and Markarfi Local government Councils. The common episodic disaster events studied are fire outbreak, violent distinctive Wing or storm, flooding and collapse of buildings and the outbreak of diseases or epidemic. The result revealed that these common episodic disaster events are caused naturally while some are man or human induced. The multiple regression results showed that there is a positive relationship between the occurrence of the episodic disaster events and the causative factors (measured by poverty, ignorance, room heating methods style and the discriminate disposal of waste). The result also revealed that fire outbreak and action of violent wind or storm cause a lot of destruction to peoples houses and properties. And the place of occurrence of the disaster is more at homes, offices places and markets. Also the percentage calculation showed that factors like room heating or warming style, poverty, discriminate disposal of waste, poor drainage system, contribute positively to the occurrence of episodic disaster events. Thus, confirming the result of the multiple regression analysis. It was recommended that people should be educated on how to develop their environment according to development plan, stop the use of wood fuel and charcoal for room heating and stop the discriminate disposal of waste which lend up blocking the drainages.

**Key words:** Causative, collapse, communities, flood, hazard and occurance

## INTRODUCTION

Disaster is defined as the occurrence of an abnormal or infrequent hazard that affects vulnerable communities or geographic areas. (Benson and Clay, 2004) they went further to say, it causes substantial damage, disruption and casualties and leave the affected communities unable to function normally (Benson and Clay, 2004; Anderson, 2000; Cohan and Coles, 2002; Cuny, 1991). Disaster is believed to be a sting of nature or repercussion of man made actions, causing losses of both natural and man made resources in affected areas (Reice, 2001; Olayiwola, 2006; Kreimer, 1991; Brallen 2003).

Disaster has continued to be an event of concern in all countries of the world. For example Hurricane, Katrina in 2006 Indean Ocean, Sunani in 2004 and Australian bush burning fire in 2009 to mention but a few. And also to a number of disciplines. Economies, Biology, Sociology, Geography, Geology and to building engineers who study it in their way

Economic disasters implies some combination of loses in financial capital and a reduction in economic activities. A biological disaster could be interpreted to mean disasters generated against the ecosystem. Sociological disaster deals on civil war, communal or political crisis and conflicts. Geological disasters covers earthquakes and volcanoes. Where as Geography cover a wide scope due to its nomenclature it studies the causes and the effects of earthquake, flooding, population pressure, AIDS/HIV, fire, malaria, famine, global warming, desertification, industrial waste disposal.

There are two types of disasters, one is caused by human action (artificial disaster) while the other natural. The former includes famine, flood, earthquake and the action of violent wind. The latter includes fire, deforestation, violence, urban flood, urban sprawl and squatter settlements. In support of this Gambari (2002) and Macheal (2005) said that the most common disasters in Africa are caused by man's violent conflicts.

In this work disaster is considered to be an unprepared shocking event or happening which has bad effects on people and their properties in urban communities. According to Olayiwola (2006) it produces a combination of shocks, lost of lives and properties

Greater Zaria has been having repeated occurrence of disasters both from natural causes and from man induced incidences. There are constant cries and complains about the increase in the rate of occurrence of disasters in greater Zaria area. These disasters includes deposit of industrial waste, increase drainage blockage and urban flooding, increase collapse of buildings outbreaks of diseases (Malaria, Direar, colera, maningietis and bed flu)

**Corresponding Author:** Abdulhamid A. Ibrahim, Department of Geography, Ahmadu Bello University Zaria, Kaduna State, Nigeria

and rampant fire outbreak in residential, markets areas and offices. Many of these disasters are caused by poverty, ignorance, ethnic plurality which creates competition for scarce resources, high population density, room density, growth of squatter settlements or structures unplanned development of land use and road traffic accidents.

The need for this study is very important when measured against the rate of disaster occurrence and the increasing risk for people's lives and properties in greater Zaria area. The aim of this study is to assess the causes of common episodic disasters and explain their rate of occurrence in the study area, as mentioned above. This studies covers all the sub-settlements in greater Zaria area, which functionally started from Soba town in the West to Giwa town in the North East and Kudan town and Makarfi town in the North and North West and to Fara kwai village in the south east justifiably, all existing settlements, villages and towns are under the rulership of the emir of Zazzau. Also emergency resources mission or facilities are provided from Zaria.

## METHODOLOGY

This study was conducted by the authors in the 2009 in Zaria urban area,Kaduna State,Nigeria located between latitude 10º10′N and longitude 7º39′E it uses both primary and secondary data. The primary data were sourced from respondents through the administration of structured questionnaires and the use of oral interviews where necessary. The questionnaire contained structured close and open ended questions to enable the freedom of expression and ensured uniformity of responses. The questions covered types of disasters which have occurred in the areas. Their causes, nature and frequencies and reasons why the occur.

The purposive sampling method as was used by Ebdon, (1977) and Peter and Peter (1971), was adopted and applied in this study to select the sample settlements for the administration of questionnaires, it was defined as a method where researchers use their discretion on a set of criteria to choose a sample size or location.

The National population commission final result of 1991 census, showing population figures for sub-settlements in Kaduna state was obtained, and used to select sampling sites. Based on this 16 urban communities with a population not less than five thousand were selected and 27 rural settlements with a population figure of not less than one thousand were also selected.

One third (1/3) of both sub-settlements types representing 5 and 9 respectively were chosen as sampling places for this study, (Table 1).

Other criteria used in the selection of sampling sites includes availability of welfare infrastructures such as government secondary schools, state general hospitals, tarred roads and pipeborn water, which is considered to be lacking in the rural settlements selected. A total of 651.4 respondents were interviewed out from 65.147, constituting 0.001% of the total population in the study area (Table 1). The questionnaires were purposively administered to household heads who agreed to be interviewed.

Table 1: Selected sub-settlements used as sampling places in greater Zaria area

| Urban communities | Population figure | Rural settlements | Population figures |
|---|---|---|---|
| Samaru | 4989 | Tankarau | 1,624 |
| Muchiya | 5359 | Saye-Tukara | 1,605 |
| Zaria city | 24,979 | Sabon gida | 1,484 |
| Soba | 8,448 | Pam Madina | 1,043 |
| Makarfi | 10,320 | Kuregu | 1,773 |
| | | Tashar Sarki | 1,210 |
| | | Kasuwan Sarki | 1,068 |
| | | Fanganu | 1,011 |
| | | Bizara | 1,335 |
| Total | 53,095 | | 12,052 |

Source: NPC (1991)

The secondary data were obtained from state government parastatals and Zaria, Soba and Makarfi local government councils. They provide statistics of the occurrence of fire disasters, flooding, and collapse of building, disease epidemic (Cholera Malaria and Meningitis). Other past unpublished projects, journals, magazines, were also consulted for information to develop literature.

The multiple regression analysis is used to describe the relationship between the dependent variable (measured as the number of times particular disaster occurred), and the independent variables (measured as factors causing the occurrence of disasters), such as poverty, ignorance, local room heating style. In order to measure the strength of the relationship and the simultaneous effects of the independent variables on the dependent variable, the following linear equation was used in analyzing the data:

$$Y = b_o + b_1 x_1 + b_2 x_2 + b_3 x_3$$

where, Y = dependent variable

$X_1$ - $X_5$ = independent variables or explanatory variables collectively explaining The Y within study

$X_1$ = poverty

$X_2$ = Ignorance

X3 = Crude room heating methods

$X_4$ = disposal of refuse in drainages

$X_5$ = population density

$b_o$ = intercept

bi - b5 = The coefficient of the respective independent variables empirically derived from the data gathered for the study.

Table 2: Occurrence rate of episodic disaster events in 2007 and 2008

| S.No. | No of episodic disaster events | Reported areas | Frequency | % |
|---|---|---|---|---|
| 1 | Fire outbreaks | | 37 times | 41.6 |
| 2 | Violent destructive wind | | 15 times | 16.8 |
| 3 | Urban flood and collapse of buildings | | 28 times | 31.5 |
| 4 | Outbreak of diseases epidemics | | 9 times | 10.1 |
| Total | | | 89 times | 100 |

Source: Fieldwork (2008)

## RESULTS

The occurrence of episodic disaster is a continuous process. It affects people and other properties irrespective of age, sex, occupation and status. Effects can come either in less mild or with high magnitude. It was confirmed by findings that the combine effects can be potent or subtle to individual or communities. It causes cannot be fully isolated from the cultural practices of people and how they run their day-to-day activities. The episodic disaster events studied were frequent fire outbreak violent destructive wind, urban flood and collapse of buildings and outbreaks of diseases epidemics. The proximate and non proximate causes of these events were also explained. Table 2, present information about the occurrence rate in greater Zaria area.

The results for greater Zaria area presented on Table 2, are for the two years (2007 and 2008). They were obtained from fire services Zaria, Sabon Gari, Makarfi and Soba Local Government Councils.

The percentage computation for the occurrence of common episodic disaster events in greater Zaria area showed that sudden fire outbreak is the most common because it happens 37 times representing 41.6%. Many reasons including ignorance, poverty, wrong connection of electricity and utilization of appliances, cause fine at homes, officer or in markets. It is followed by flooding which happened 28 times representing 31.5%. It is caused by blockage of the drainage, where it exist by the household refuse, which consequently leads to the collapse of building. This followed by destructions of house roofs caused by violent wind or storm with 16.8% and the least is the outbreak disease or epidemic (Cholera, meningitis, malaria, diearea), which is the lowest, may be because of lack of data from the authorities concerned.

In this study, the occurrence rate of episodic disaster events total figure used is treated as dependent variable while the causative factors, poverty, ignorance, room heating style and others, which individually and or jointly causes the episodic disaster events in the sub-settlements in greater Zaria area as independent variables. The result of the analysis is summarized on Table 3.

The multiple R showed a strong relationship between the five causative variables collectively as proximate determinants of episodic disaster events in greater Zaria area.

The proportion of the variation in episodic disaster events (as measured by total occurrence of the disasters (Y) explained by the independent variables (X1 - X5) operating jointly is indicated by R2, which is high (0.51 or 51%). The standard error (6.10) suggesting that on the average, predicted not less than 6 episodic disaster events happened yearly in greater Zaria area. This is confirmed by the "F" ratio which is 11.62 showing that it is statistically significant at 0.01 confidence level.

Table 3: Selected episodic disaster event result from multiple linear regression analysis

| Statistics | Coefficient obtained |
|---|---|
| Multiple R | 0.59 |
| R2 | 0.51 |
| Standard error | 6.10 |
| Overall F | 11.62 |
| Bo (Intercept) | 8.51 |
| Slop of coefficient | |
| b1 poverty | |
| b2 Ignorance | |
| b3 Crude room heating style | |
| b4 Disposal of refuse in drainages | |
| b5 Population density | |

Sources: Field work (2008)

The implication of this result is indicating that the observed linear relationship or the association between occurrence of episodic disaster events and the causative factors (measured by poverty, ignorance, illiteracy, room heating style and others), in greater Zaria area was not due to chance. It is interesting to note that these variables individually or separately do not contribute much to the occurrence of episodic disaster events alone but show a fairly good fit. This might not be unconnected with the fact that social ecology of the people, their settlement pattern and building styles, the pattern of land use development and how they run their activities are also contributing factors.

The summary of responses and secondary data showing effects of disaster events on land use is presented on Table 4.

Table 4, presents summarized information on the destruction caused by episodic disaster events in greater Zaria, 2007/08. The vertical frequency and total column showed information of the four episodic disaster events studied while the horizontal column showed information of the episodic disaster events for particular land use in 2007/08 period.

From the report presented destruction by violent wind or storm is highest with (35.7%). It is followed by urban flood caused by blockage of drainage and the lack of most particularly in the Zaria city, with (32.0%). Fire outbreak in homes and at activity places constitutes a major threat,

Table 4: Summaries of Episodic disaster event destruction to land use and lives in greater Zaria Area 2007/08

| | Homes | | Offices | | Schools | | Markets | | Lives lost | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disaster events | 2007 | 2008 | 2007 | 2008 | 2007 | 2008 | 2007 | 2008 | 2007 | 2008 | F 2007 | % 2008 |
| Fire | 17 | 6 | 2 | 2 | 1 | 3 | 4 | 3 | 3 | 7 | 48 | 26.4 |
| Violent wind or storm | 9 | 14 | 2 | 11 | 5 | 8 | 2 | 4 | 7 | 3 | 65 | 35.7 |
| Flood and collapsing building | 14 | 17 | 5 | 3 | - | 1 | 4 | 1 | 5 | 9 | 59 | 32.0 |
| Diseases | 4 | 6 | | - | - | - | - | - | - | - | 10 | 5.0 |
| Total | 44 | 43 | 9 | 16 | 6 | 12 | 10 | 10 | 15 | 19 | 182 | 100 |
| % | 24.2 | 23.6 | 5.0 | 8.8 | 3.0 | 6.6 | 6.6 | 5.5 | 8.0 | 10.0 | | |

Sources: Field work (2008)

Table 5: Causative factors for occurrence of episodic disaster events in greater Zaria Area

| Causative factors | Frequencies | % |
|---|---|---|
| Residential building style | 14 | 5.9 |
| Competition for scarce resources | 2 | 0.8 |
| Illiteracy | 13 | 5.5 |
| Room heating style | 34 | 14.0 |
| Ignorance | 11 | 4.6 |
| Ethnic rivalry | 4 | 1.7 |
| Poverty | 41 | 17.0 |
| Mixed or unplanned land use | 22 | 9.0 |
| Indiscriminate disposal of waste | 27 | 11.0 |
| High room density | 16 | 6.7 |
| Existing squatter settlements | 9 | 3.8 |
| High population density | 14 | 5.9 |
| Poor drainage system | 31 | 13.0 |
| Total | 238 | |

Source: Field work (2008)

also has a good fit of (26.4%). Diseases or epidemic have resulted in the lost of lives, but data were not available during the study.

The horizontal report showed that the occurrence of episodic disaster events is very high in homes with (24.2%) in 2007 and (23.6%) in 2008. This may be caused attributed to the social ecology of the resident people, the close style of buildings in the traditional city and in villages.

The responses as obtained by the questionnaire were subjected to percentage test and the results obtained further supported the multiple regression result, on Table 5.

The total is more than the number of questionnaire use, because some respondents ticked more than once.

The result on the table showed that causative factors like traditional room heating style, poverty, discriminate disposal of waste, poor drainage system with 14, 17, 11 and 13%, respectively, are contributing significantly to the occurrence of man induced disaster events in greater Zaria area. While others like existing squatter settlements, competition for scarce resources and ethnic rivalry show very weak percentage. It also showed that room density, residential building style and illiteracy are not proximate causative factors, but however they supported the factor in the multiple linear regression analysis statistical result which showed a strong fit. The implication of this finding is that the occurrence of episodic disaster events in greater Zaria area is a function of many causative factors supporting each other, they combine to create potent and at times subtle effects on individuals and on communities where they occur.

## CONCLUSION

Greater Zaria has been witnessing series of common episodic disaster events, some are caused naturally while some are human induced. Attempt was made in this study to make an assessment of selected disaster (fire outbreak, violent wind or storm, flooding and collapse of building and disease outbreak or epidemic). The result revealed that a number of factors caused the occurrence of this common episodic disasters events, some are proximate and some are non proximate. The end result of disaster event is the effect it has on people's lives and their properties, which are at times potent and at times subtle. It was found out that even after the disaster events have happened the woes of their deeds are still felt.

Generally, these disasters produce a lot of negative socio-economic impact in the study area. It is therefore recommended that people should be educated on how to use their environment and welfare facilities like electricity points at homes. Control the degree of environmental abuse and misuse by controlling illegal constructions or growth of land use, disposal of refuse waste in drainages and the use of wood fuel or charcoal for room heating.

## ACKNOLODGEMENT

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