International Journal of
Environmental Sciences

(A peer reviewed International Journal)

Socio-Economic Impact Assessment of Flash Flood in Jalingo Metropolis, Taraba State, Nigeria

International Journal of Environmental Sciences, Vol. 1 No. 3. pp. 135-140. 2277-1948. 2012

ISSN *2277 – 1948*

Article type *Full Length Research Article*

Submission date 30 *April 2012*

Acceptance date *30 June 2012*

Publication date *15 July 2012*

Article URL *http://www.crdeep.org/category/ijes*

Author *E. D. Oruonye*

CRDEEP Head Office:315/10, Kaulagarh Road, Rajendranagar, Indervihar, Dehradun, 248001, Uttrakhand, India.

International Journal of Environmental Sciences Vol. 1 No. 3. 2012. Pp. 135-140

Full Length Research Paper

Socio-Economic Impact Assessment of Flash Flood in Jalingo Metropolis, Taraba State, Nigeria

E. D. Oruonye

Department of Geography, Taraba State University, P.M.B. 1167, Jalingo,Taraba State, Nigeria.

ABSTRACT
Extreme floods have serious social and economic impacts on a community. Flood disaster affects people's live and livelihoods in many ways; this include lost of lives, injury, illness or stress (physically and psychologically), destruction of houses and disruption of social networks. This study examines the extent of damages and losses caused by the two major extreme flood events (August 7th, 2005 and August 14th, 2011) in the study area. Data for this study was generated through participant observation, interview with relevant stakeholders and information from Nigerian Newspapers and internet. The result of this study shows that over 100 people lost their lives, while more than 50,000 others were displaced in the 2005 flood disaster. Over 307 houses were completely destroyed, 455 partially affected, 198 farms washed away and 4,409 persons were internally displaced by the 2011 flood disaster. This study recommends the need for better and effective flood mitigation system to ensure the safety of people and economy such as flood alert and early warning mechanism. Also the construction of dam on the upstream of river Lamurde can go a long way in reducing the incidence of flooding in the study area.

Keywords: *Assessment, Flash flood, Impact and Socio-economic.*

INTRODUCTION

Flooding is the most common of all environmental hazards and it regularly claims over 20,000 lives per year and adversely affects around 75 million people world-wide (Smith, 1996). Across the globe, floods have posed tremendous danger to people's lives and properties. Floods cause about one third of all deaths, one third of all injuries and one third of all damage from natural disasters (Askew, 1999). Apart from droughts, about 90% of damages relating to natural disasters are caused directly or indirectly by floods. Record shows that more than two hundred people have lost their lives to flooding while hundred of thousands have been rendered homeless and properties worth billions of Naira have been destroyed as a result of devastating floods across the country (Abugu, 1988; Oluduro, 1988; Sunday Times, 1988; Fabowale, 1997; Opalana, 2005). Flooding in various parts of Nigeria have forced thousands of people from their homes, destroyed businesses, polluted water resources and increased the risk of diseases (Baiye, 1988; Akinyemi, 1990; Nwaubani, 1991; Edward-Adebiyi, 1997). This is due to the fact that as urban population keeps on increasing, more and more people are living in flood-prone areas, such as areas along river beds and floodplains, which consequently increase the damage and death toll (Adeoye *et al*, 2009). They usually are caused by intense storms that produce more runoff than an area can store or a stream can carry within its normal channel. Rivers can also flood its surroundings when the dams fail, when ice or a landslide temporarily block the course of the river channel, or when snow melts rapidly. On larger streams, floods usually last from several hours to a few days. A series of storms might keep a river above flood stage (the water level at which a river overflows its banks) for several weeks.

Floods bring misery to affected people. They can cause loss of life and often cause a great disruption of daily life: water can come into people's houses, drinking water and electricity supplies may break down, roads can be blocked, and people cannot go to work or to school (Adeoye *et al*, 2009). Floods generally cause enormous damages worldwide every year. This could be economic damages, damage to the natural environment and damage to national heritage sites. Although different parts of Jalingo LGA is exposed to flood almost every year, the 2005 and 2011 floods break all records of the past. The 2011 flood devastated three north eastern states of Borno, Bauchi and Taraba, washing away over 4000 farms and destroying over 5000 houses (Timothy, 2011). In Taraba state alone, the flood destroyed over 2,068 farms, 363 houses and partially affected 1,562 houses. Over 6,213 persons were internally displaced and 1,420 families affected by the flood in 4 LGAs, Jalingo, Lau, Ardo Kola and Yorro (Timothy, 2011). It therefore becomes necessary to investigate the socio-economic impacts of flash flood in the study area so as to find a lasting solution to the negative effect resulting from it.

SIGNIFICANCE OF THE STUDY

This study is significant because it will enable the government and individuals to appreciate the enormity of the lost from the flood disaster and work together towards finding lasting solutions that will help to reduce these loses and destruction in the study area. The study will also provide a baseline data for future studies on flood disaster assessment in Jalingo Metropolis.

DESCRIPTION OF STUDY AREA

Jalingo LGA is roughly located between latitudes 8°47' to 9°01'N and longitudes 11°09' to 11°30'E. It is bounded to the north by Lau Local Government Area, to the east by Yorro Local Government Area, to the south and west by Ardo Kola Local Government Area (Fig. 1). It has a total land area of about 195km^2. Jalingo LGA has a population of 139,845 people according to the 2006 population census,

with a projected growth rate of 3% (Shuwabolo *et al*, 2009). Presently, it has a projected population (2011) of 170,483. The relief of Jalingo LGA consists of undulating plain interspersed with mountain ranges. This compact massif of rock outcrops (mountains) extends from Kona area through the border between Jalingo and Lau LGAs down to Yorro and Ardo Kola LGAs in a circular form to Gongon area, thus given a periscopic semi-circle shape that is almost like a shield to Jalingo town.

Jalingo LGA is drained by two major rivers Mayogwoi and Lamurde (Fig. 1), which took their source from the mountain ranges in Yorro LGA and emptied there content into the Benue river system at Tau village. The valleys of these rivers are dotted with ox-bow lakes which are as a result of depositional activities. Jalingo LGA has tropical continental type of climate characterised by well marked wet and dry season. The wet season usually begins around April and ends in October. The dry season begins in November and ends in March. The LGA has a mean annual rainfall of about 1,200mm and annual mean temperature of about 29^{o}C. Relative humidity ranges between 60 – 70 per cent during the wet season to about 35 – 45 per cent in the dry season. Vegetationally, Jalingo is located within the northern guinea savanna zone characterized by grasses interspersed with tall trees and shrubs. Some of the trees include locust bean, sheabutter, eucalyptus, baobab and silk cotton tree.

The major ethnic groups of Jalingo LGA are the Fulani, Jibu Kona and Mumuye, while other ethnic groups such as Hausa, Jenjo, Wurkum and Nyandang are also found. Hausa language is widely spoken as a medium of communication for social and economic interactions.

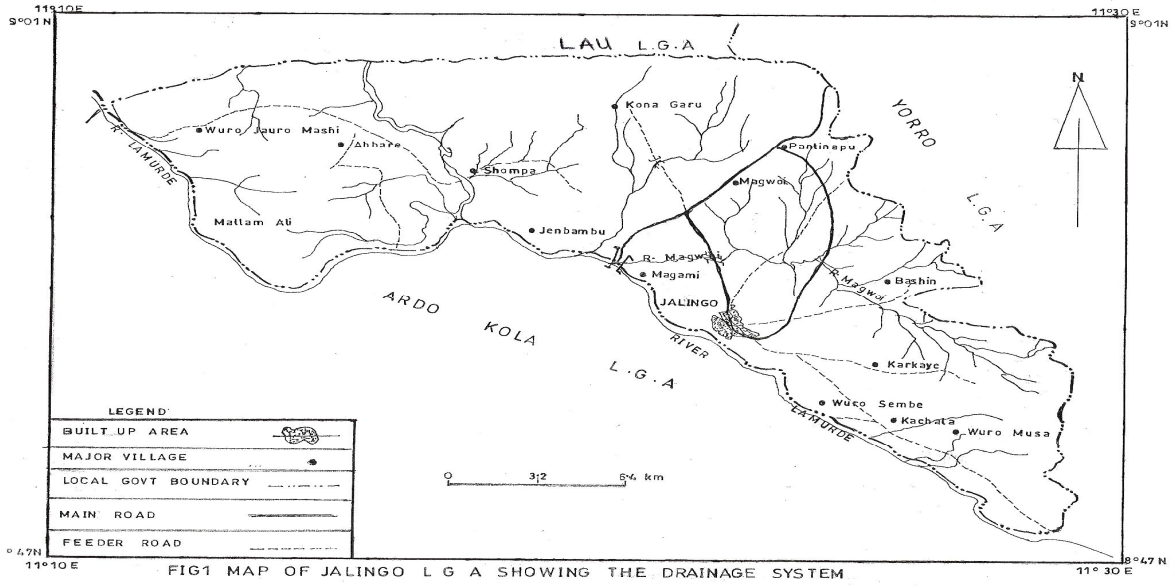

FIG1 MAP OF JALINGO L G A SHOWING THE DRAINAGE SYSTEM

MATERIALS AND METHODS

Both primary and secondary data were used in this study. The primary data include participant observation and interview with relevant stake holders such as the Nigerian Red Cross Society, Taraba State Emergency Management Agency (SEMA) and Taraba State Environmental Protection Agency (TASEPA). The secondary data include information on flood events recorded in Nigerian Newspapers and internet, date of flood events, affected communities, number of people affected, associated hazards, relief materials distributed to victims, cost of relief materials, government response and challenges of disaster management among others. The information is meant to help us understand the magnitude of flood disaster in Nigeria over time and its socio-economic impact on the welfare of the people.

Theoretical Framework

Socioeconomic impact assessment is the analysis of the potential impacts of new development or natural disaster on local communities and wider societies and the development of strategies to manage these impacts (Oruonye 2011). The objectives of socio-economic impact studies are to predict and limit adverse impacts of new development or natural disaster and to build positive relationships with communities and stakeholders. Socio-economic impact assessment is designed to assist communities in making decisions that promote long term sustainability, including economic prosperity, a healthy community and social wellbeing. Because socio-economic impact is designed to estimate the effects of a natural disaster on a community's social and economic welfare, the process should rely heavily on involving community members who are affected by the natural disaster. Socio-economic impact assessment therefore provides a foundation for assessing the cumulative impacts of a natural disaster on a community's social and economic resources.

RESULTS AND DISCUSSION

Causes of the flood disaster

The causes of the August 7th 2005 flood in Jalingo LGA was as a result of the high rainfall that lasted for over eight hours from the hills surrounding the town. The flash flood over-flooded the river bank. The flood was said to be unprecedented in the last 40 years (Barde, 2005). Six years later there was a repetition of the flood disaster. The rain which started at about 10:35am on Sunday 14th August, 2011 lasted till 2:45pm of same day (over 4 hours). The heavy down pour measured 120mm^{3} at the COE weather station. There was loses of lives and properties worth millions of naira. Most of the houses affected in the study

area were those built on the flood plains of the Mayogwoi and Lamurde Rivers. The worst hit areas were the low lying, poorly drained, unplanned and in some cases high density areas in the metropolis. These include ATC area, behind Awoniyi quarters, Sabon gari, Mallam Gabdo, Mafindi and Lamurde areas. The river over flows its bank to a distance of about 1.5km on both sides in some places.

The Socio-economic Impacts of the 2005 flood

The result of the findings show that over 100 people lost their lives, while more than 50,000 others were displaced in the 2005 flood disaster (Barde, 2005; IFRCRCS, 2005). This is summarized in Table 1.

Table 1. Impact of Flood on human lives and properties

S. No.	Flood impact on human lives and properties	No. of People affected
1	Lose of human lives	Over 200
2	Houses completely swept off	80
3	Houses extensively destroyed	410
4	Households/families displaced	2,661

The study findings show that 40 percent of Jalingo LGA residents were affected by the 2005 flood going by the 2006 National population census which puts the figure at 139,000. The most affected areas in the LGA are Mafindi, Nukkai, Magami, Lamurde, Mallam Gabdo and Sabon-gari. The study findings show that 3 camps were established to take care of the internally displaced persons in the wake of the 2005 flood in the study area as shown in Table 2.

Table 2. Distribution of Internally Displaced camps during the 2005 flood

S. No.	Internally Displaced persons Camps	No. of Families accommodated
1	Mafindi Primary School	1100
2	Lamurde Primary School	880
3	Nukkai Primary School	621
4	Total	2601

Many infrastructural facilities were destroyed by the flood. The most important of these infrastructures was the Nukkai bridge which collapse as a result of the flood. The Nukkai Bridge links the state capital, Jalingo with other parts of the country, as well as people on the other side of Jalingo town. About 80 persons standing on the bridge were swept away by the powerful currents when the bridge collapsed. Among those drawn in the flood was an assistant commissioner of police who had gone to disperse the crowds from the bridge. Other victims were 68 persons and goods in an engine boat being ferried across River Nukkai during the flood. The boat upturned, killing an unspecified number of people (Barde, 2005). About 40 dead bodies were recovered by 26 August 2005.

About N11,655,000 (US$ 77,700) was used from the Federation's Disaster Relief Emergency Fund (DREF) to assist about 2,700 persons affected by the flood for a period of three months (IFRCRCS, 2005).

SOCIO-ECONOMIC IMPACT OF THE AUGUST 14TH, 2011 FLOOD IN JALINGO LGA

The result of the findings of this study shows that the 14th August, 2011 flood disaster affected Jalingo town and neighbouring LGAs of Ardo Kola, Yorro and Lau LGAs in Taraba State as shown in Table 3

Table 3. Impact of 2011 Flood on human lives and properties in the study are

S. No.	Flood impact on human lives and properties	No. of People affected
	Jalingo LGA	
1	Houses completely destroyed	307
2	Houses partially affected	455
3	Households/families displaced	4,409
4	Farmlands completely washed away	198
	Lau LGA	
1	Houses completely destroyed	500
2	Houses partially destroyed	1097
3	Families affected	945
4	Farmlands destroyed	2021
	Yorro LGA	
1	Houses completely destroyed	50

2	Families displaced	2,173
3	Farmlands destroyed	149
4	Fishing Ponds affected	610
	Ardo Kola	
1	Houses completely destroyed	6
2	Houses partially destroyed	10
3	Families affected	475
4	Farmlands destroyed	500

The study findings show that about 4,409 persons were internally displaced by the 2011 flood in Jalingo Metropolis and were camped at three IDPs camps in town as shown in Table 4.

Table 4. Distribution of Internally Displaced camps during the 2005 flood

S. No.	Internally Displaced persons Camps	No. of Persons accommodated
1	Mafindi Primary School	1,739
2	Magami Lowcost Primary School	1,314
3	Mallam Gabdo Primary School	1,356
4	Total	4,409

Source: (ASN, 2011)

children and 271 families as camp residents and Magami Low-Cost Primary School IDPs Camp also has 555 women 379 children, with a total of 134 families residing in the camp, while the remaining affected people prefer to squat with families and relations in the other parts of the town and local government areas of the state (ASN, 2011). The affected people suffered seriously from lack/shortages of food, drinking water, sleeping mats and Medicare. During a field visit to the IDPs camps, it was discovered that many had left the camp to stay with relations since help from the government was not forthcoming, while those who had no relations or alternative places to go, mostly women and children stayed back and were been attended to by members of the Nigerian Red Cross Society. The affected people took advantage of the school's holiday to sleep in the classrooms. However, they were asked to leave the IDPs camps after the second week of the flood disaster because of the resumption of schools. Government promised to contact them when the need arises. The flood swept away large numbers of animals. The State Ministry of Health placed communities along the riverine areas under health surveillance for any possible outbreak of epidemics.

The boreholes used for municipal water supply in the metropolis were completely submerged and polluted by the flood. The Municipal water supply was grounded for over two weeks because of pollution of the boreholes. The general public were left to depend on well and open surface water for their domestic uses. Those who can afford it resort to satchet water. About 42 cases of cholera outbreak were reported in one of the IDPs camp at Mallam Gabdo. The state government spent 8.3million naira to flush out the 10 polluted boreholes.

Mallam Gabdo Primary School IDPs have over 245 women, over 207 under five-year-old children, 951 over five-years-old children and 178 families (ASN, 2011). At Mafindi Primary School, the IDPs Camp has 408 women, over 1,266

The road linking Jalingo and Lau LGAs was washed away at Garin Dogo, thereby cutting the people from the state capital. The floods unleash hardships and difficulty to the people most of whom are already very poor and struggled daily to make a living. Several farmlands along the banks of the rivers were destroyed (Plate 3). The Jalingo bye pass road was also partly eroded (Plate 4 and 5).

The loses that follow the 2011 flood in Jalingo metropolis which ranges from destruction of buildings, vehicles, motor cycles, household utilities and documents were enormous. Report in the state media houses indicated that many of the affected people have earlier been paid compensation by the government to evacuate from the area following the last flood disaster of 2005. Many collected the compensation money and did not relocate, while others relocated to other places after selling the piece of land to unsuspecting members of the public. These unsuspecting members of the public ignorantly purchase the land and developed structures on them.

The two flood disasters disrupted socio-economic activities in the study area for hours. Traffic flows and commuters were disrupted. People suddenly found themselves trapped by the flood as they could not get to their houses. In the 2011 flood, people and traffic were forced to go round by taking the Jalingo bye pass road, while in the 2005 flood; people have no means of crossing over to the other side of their town where they are living. Some idle youths took advantage of the situation to earn money for themselves by crossing people to the other side of the river on their back.

Plate 1. The August 2011 flood across the Jalingo-Wukari road at Nukkai

Plate 2. The 2011 Flood water under Nukkai bridge along Jalingo-Wukariroad

Plate 3. Flooded houses and farmlands during the August 2011flood.

Plate 4. Farmlands flooded by the August 2011flood.

Plate 5. Jalingo bye pass road that was partly affected by the flood.

CONCLUSION

This study has examined the socio-economic impact of flash floods in the study area. The study findings shows that although flash flood is annual event in the study area, the 2005 and 2011 flash was the most devastating of all the floods. The floods unleash hardships and difficulties to the residents of the study area. With recent problems of climate change and increasing frequencies of the flood events, it is necessary for the government and the residents to make concerted effort at reducing the adverse impacts of flooding in the study area.

RECOMMENDATIONS

This study recommends the need for better and effective flood mitigation system to ensure the safety of people and economy such as flood alert and early warning mechanism. Also the construction of dam on the upstream of river Lamurde can go a long way in reducing the incidence of flooding in the study area. To avert damages from flood disaster in the future, there is need to educate the people living on the flood plain who are vulnerable about the risk and hazard associated with continuous occupation of the area.

REFERENCES

Adeoye, N.O., Ayanlade, A. and Babatimehin,O. (2009). Climate Change and Menace of Floods in Nigerian Cities: Socio-economic Implications. *Advances in Natural and Applied Sciences*, 3(3): 369-377.

African Science News (2011). Flash floods devastate 3 Nigerian states.

http://www.africasciencenews.org/en/index.php/entertainment/52-environment/109-flash-floods-devastate-3-nigerian-states

Akinyemi, T., 1990. Stemming the Tide of Lagos Floods, in: *The Guardian*, Friday, July 20, pp: 7.

Askew, A.J., 1999. Water in the International Decade for Natural Disaster Reduction. in: Leavesley *et al* (eds.)

Destructive Water: Water-caused Natural Disasters, their Abatement and Control. *IAHS Publication* No.239. *Adv. in Nat. Appl. Sci., 3(3): 369-377, 2009* 377

Baiye, E., 1988. Numan in the Throes of Floods, in: *The Guardian*, Thursday, October 8, pp: 9.

Barde, I.J. (2005). Jalingo residents still licking wounds …one month after. Daily Sun Newspaper, Wednesday, September 14, 2005. Lagos, Nigeria.

Edward-Adebiyi, R., 1997. The Story of Ogunpa, in: *The Guardian,* Saturday, May 17, pp: 5.

Fabowale, Y., 1997. Ogunpa Disaster, in: *The Guardian on Sunday Magazine*, May 4, pp: B1.

International Federation of Red Cross and Red Crescent Societies (IFRCRCS) (2005) Report. **ME no. 05ME51, 29 August, 2005**

Nwaubani, C., 1991. Ogunpa River Leaves Bitter Aftertaste in Tragic Course Through Abeokuta; in: *The Guardian*, October 21, pp: 9.

Oluduro, C. (1988). Grappling with the Problem of Flood, in: *Daily Times*, Tuesday July 5, pp.11

Opalana, T., 2005. Experts Proffer Solutions to Lagos Flooding, in: *Nigerian Tribune*, Tuesday 21 June, pp: 24.

Smith, K., 1996. *Environmental Hazards*. London: Routledge. Sunday Times, 1988. Floods; Here, there and Yonder (Editorial Comment), pp: 9.

Timothy, O. (2011). Flood Displaces 8 LG Residents in Bauchi and Taraba States – NEMA. The Sun Newspaper, Thursday, September, 2011.

http://www.sunnewsonline.com/webpages/news/national/2011/aug/29/national-29-08-2011-021.html