



EVALUATION OF THE PERCEPTION AND EFFECTS OF FLOOD DISASTER ON CROP FARMERS IN EDO STATE, NIGERIA

Odiana S.,¹ Mbee D. M.² and Akpoghomeh O. S.³

¹Department of Environmental Management and Toxicology, Faculty of Life Sciences, University of Benin, P.M.B. 1154, Benin City, Edo State, Nigeria.

^{2,3}Department of Geography and Environmental Management, Faculty of Social Sciences, University of Port Harcourt. P.M.B. 5323, Port Harcourt, Rivers State, Nigeria.

*Corresponding Author E-mail: odiana09@yahoo.com +2347030559493

Received: December 13, 2021 Accepted: February 20, 2022

Abstract:

Flooding can be seen as an inundation of water in a place that is naturally dry. Flood is one of the natural hazards devastating the environment over the years. Some of the factors resulting to flood disaster include dumping of solid wastes in stream, river channels, surface drains, along the road side and on the flood plain. When it happens it brings about the destruction of lives, crops, farmland etc. This paper aimed at evaluating the perception and effects of flooding on crop farmers in Edo State, Nigeria. Sample size was determined using Taro Yammane formula. A total of 400 crop farmers were drawn as the sample size. The study used survey research techniques where questionnaires designed in liket scale were distributed to the crop farmers obtained using multistage sample technique. The data obtained was analysed using mean and standard deviation and the result obtained revealed that most of the crop farmers were literate and had high awareness of flooding with consequential effects on them. Therefore, government should construct adequate drainage system to convey excess runoff away to safer locations so as to reduce the incidences of flood occurrences.

Keyword: Edo; effects; farmers; flooding; multistage; perception

Introduction

Flooding is one of the most common and widely distributed natural risks to life and property worldwide. It has a special place in natural hazards and accounts for approximately one third of all natural disasters in both developed and developing world (UNISDR, 2012). Flooding is also responsible for more than half of all related fatalities and a third of the economic loss from all natural catastrophes. Flood occurs when there is an inundation of any area which is not normally covered with water, through a temporary rise in the level of a river, lake or sea, and when excess precipitation exceed natural infiltration, evaporation, and possible transmission (Werner, Hunter, & Bates, 2006). They are generally regarded as extreme hydrological events, where there is excess of water which may have devastating effects. A system is susceptible to floods because of its exposure, and its capacity or incapacity to be resilient, cope, recover or adapt to the extent of damage (Balica, Wright & Van der Meulen 2012).

In Nigeria context, flooding events are influenced by a range of factors including: the overflow of the

numerous rivers that transverse the country, unprecedented rainfall amounts and intensity, dam breaks and levee failure, the unavailability and/or insufficient drainage systems and the underutilization of dams in some parts of the country. In some locations, illegal dumping of refuse along water ways and drainages has influenced flooding events in urban cities (Emmanuel, Unaegbu & Baker 2014). Disasters such as flooding will have a huge impact especially on food security which is vulnerable to extreme events such as flooding (Nzeh, *et al.*, 2012). This is because crops and the general wellbeing of crop farmers are usually affected. Basically, public perception of flooding is often overlooked when developing flood management plans. Perception of flood at both the individual and public level represents a key societal component in flood management that is integral to determine the response to flood warnings and efforts to increase community preparedness. Previous flood management policies have been known to fail or be adversely affected when policy makers overlook the subjective and

highly contextualized nature of public perception (Granger-Morgan, 1995; Brown & Damery, 2002).

This study therefore paid emphasis on the assessment of crop farmers' demographic characteristics, effects and perception of flooding, as a measure to help enhance the mitigation and management of floods in Edo State.

Methodology

This study was carried out in Edo State Nigeria as shown in figure 1, comprising Edo South, Central and North Senatorial Districts. Edo state which was created in 1991 out of the old Bendel state is one of the Niger Delta States. It has a population of 3218332 comprising of 1640461 males and 1577871 females based on 2006 census. The state covers a land mass of about 19638SqKm.

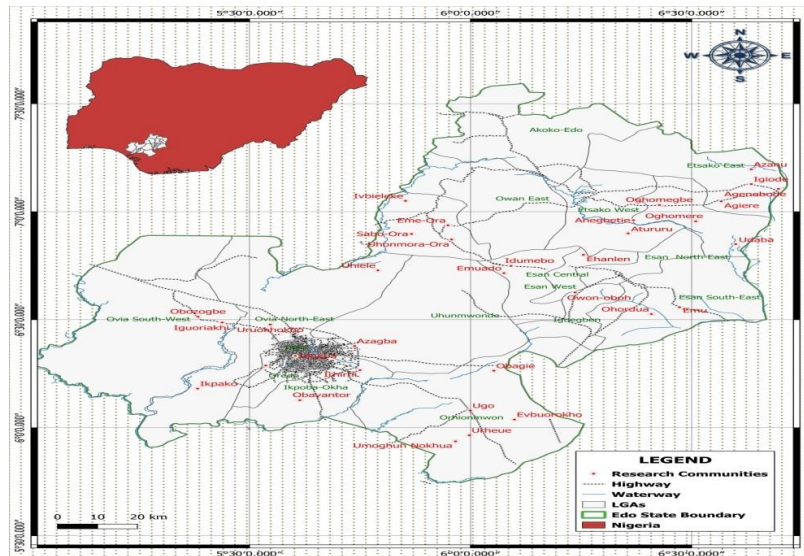


Fig 3.1. Map of Edo State

Sample Size Determination

The study drew a sample size of 400 from a total of 91000 crop farmers in Edo State. The sample size was determined using the formula for sample size determination as given by Yamane (1967) as

$$n = \frac{N}{1 + N(e)^2}$$

Where

n = sample size

N = population size (number of crop farmers in Edo State)

e = acceptable sampling error margin ie 0.05

1 = constant

Sampling Techniques

A multistage sampling technique was used to select four hundred (400) crop farmers for this study. Firstly,

ten (10) agricultural blocks were randomly selected. In each agricultural blocks and with the assistance of the Extension Services Department, farming communities/cells were identified, from which four (4) communities/cells were randomly selected making a total of forty (40) communities/cells for the study. In each selected community/cells, with the assistance of Extension Agents, ten (10) crop farmers were randomly selected, bringing the total sampled respondents to four hundred (400) for the study.

Methods of Data Collection

Questionnaires designed in Likert scale was used to obtain information for this research.

Methods of Data Analysis

The data collected for this research were subjected to descriptive statistics such as mean and standard deviation. Other descriptive statistical methods that were employed were simple frequency, percentages, charts and graphs where necessary.

Result and Discussion
Demographic Characteristics of the Crop Farmers

The demographic characteristics considered were sex, age, marital status and educational qualification as shown in Table 1 below. The knowledge of the demographic characteristics of the crop farmers enables data to be generated that can be transformed into significant information which can be used to assess the perception and effects of flood disaster in the study area.

Table 4.1 Demographic characteristics of the crop farmers

Characteristics	Components	Frequency	Percentage (%)
Gender	Male	285	71.2
	Female	115	28.8
	Total	400	100.0
Age	30 or less	42	10.5
	31-40	141	35.3
	41-50	139	34.8
	50 and above	78	19.5
	Total	400	100.0
Marital Status	Married	337	84.3
	Single	46	11.5
	Widow or widower	11	2.8
	Others	6	1.5
	Total	400	100.0
Educational Level	Primary	134	33.5
	Secondary	196	49.0
	Tertiary	46	11.5
	No formal education	24	6.0
	Total	400	100.0

Source: Researcher’s computation, 2021

The result revealed that most of the people who engage in farming activities in the study area were males which attest to the fact that there are more males in farming in Nigeria (Kasali *et al.*, 2009). This could be attributable to the fact that women have smaller and less secure plots of land (Oseni *et al.*, 2013). women are also mostly not opportune to own farms due to cultural biases (Fasina, 2013) The finding obtained in this study is consistent with those reported by Okeleye *et al.*, (2016); Umar and Muazu, (2017). This result showed that most of the crop farmers were in their economically productive age of less than 50 years of age which corroborates with the findings of Oruonye (2012); Oyatayo *et al.*, (2016) Umar and Muazu (2017); Salami *et al.*, (2017).It is worthy to note that the older farmers are more vulnerable to the outcome of disasters like flooding as a result of challenges they may have in preparedness and recovery. This agrees with the work

of Maltais (2019) which reported that throughout the world, catastrophic events such as floods in senior homes have unfortunately affected many people over the age of 65. Some of these people suffered serious injuries, other feared for their lives, and unfortunately, many of them were unable to deal with the dangers.

Most of the crop farmers were married. This is in line with Owolabi (2013); Okeleye (2016). Married farmers could benefit from supports they get from their spouses. This is in agreement with Fasina (2013) which reported that the fact that majority of their respondents are married could imply that couples are engaged in cooperative effort in farming activities or operation. Those married could also have persons that could assist if disaster like flooding occurs thereby enhancing their preparedness and coping capacity. This is consistent with the report of Owolabi (2013). Most of the crop farmers were literate which corroborates with Ahile and Andityavyar (2014); Oyatayo *et al.*, (2016). Their

level of education is encouraging as it will help in embracing innovations and developments geared towards enhancing their preparedness and coping capacity to flood disaster. This is in line with Muttarak and Pothisiri (2013), which stated that educational level of residents could influence their level of preparedness for disaster.

Perception of Flooding by Crop Farmers

The mean of the result on perception of flooding as shown in figure 2 below revealed that the crop farmers expressed disagreement with only two items. That is, flooding can cause widespread and disastrous consequences and flooding is a normal event that should happen. They were however in agreement with others items. Therefore, from the result, it can be inferred to a large extent that the crop farmers had awareness of flooding.

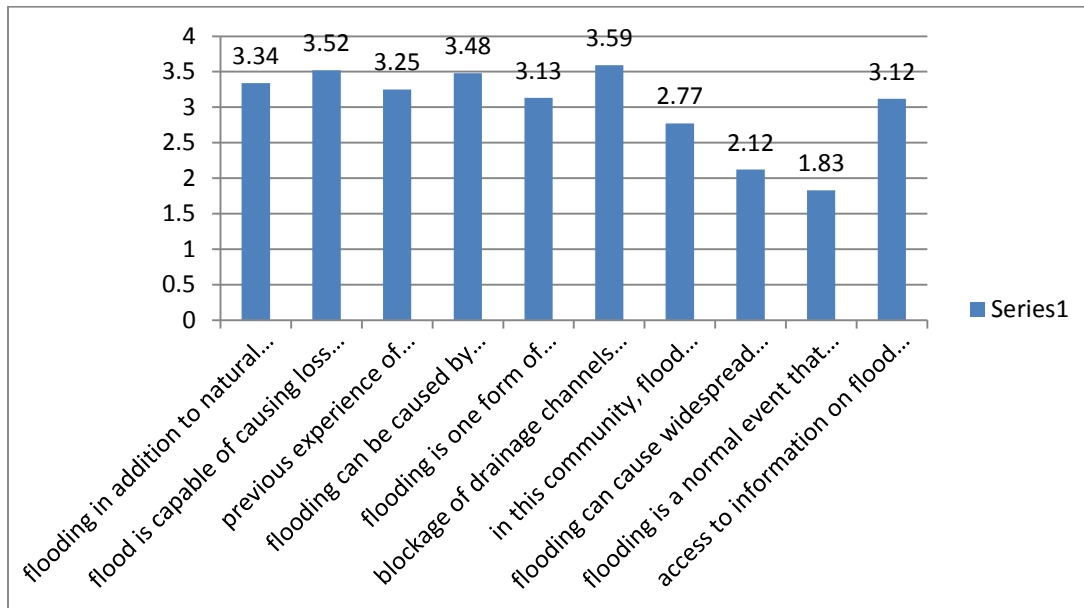


Fig. 2 Perception of flooding by crop farmers

The crop farmers to a large extent were aware of flooding. This finding corroborates that of Oruonye (2013). Generally, awareness of flooding will enable the farmers to prepare and cope with the disaster. In this study, the crop farmers agreed that flooding in addition to natural factors can also be caused by human activities which is in agreement with Umar and Muazu (2017) where they stated that flooding may be caused by both natural and man-made induced factors. The interview conducted on staff of Edo State Agricultural Development Programme revealed that the major causes of flooding of worrisome to the farmers in the study area are rainfall and overflow from surface water bodies. Muhammad (2015) reported that Rainfall intensity, duration and amount are generally believed to be the principal

factors in most flood events in the tropics which are partly or wholly climatological in nature. It also agrees with Ocheri and Okele (2012), who revealed that flooding events in Makurdi town, Benue state, occur mostly at the event of rainfall intensity and amount. Similarly, Umar and Muazu *et al.*, (2017) reported that respondents were of the view that overflow of stream and dam burst are some of the natural causative factors in accelerating the rate of floods in the area.

The farmers in this study were also in agreement that inadequate drainage and blockage of existing ones could contribute to flooding in the study area. This finding is similarly to what was obtained in Umar and Muazu *et al.*, (2017) where most of their respondent agreed that lack of drainage networks exacerbated the rate of flooding. It is believed that good drainage systems are intended to

regulate surface water runoff and provide opportunities to reduce the causes and impacts of flooding. The farmers in this study were of the opinion that previous experience of flooding is a key determinant of one's awareness of flood risks. Studies have also showed that previous experience shape people's attitude and response to future flood events (Kreibich *et al.* 2005; Harvatt *et al.* 2011). The relevance of previous experience of flooding can be seen in the study done by Salami *et al.*, (2017) in which most of the respondents claim that the motive of their awareness of flooding was through their previous experience. Farmers in this study perceived flooding as capable of causing loss of livelihood in the study area because over stay of flooded water on farmlands consequently affect crops. Likewise access

roads linking the farmland could also be affected by flooding thereby causing serious challenge in accessing the farm and in conveying farm produce out of the farm. Socio-economic dynamics is recognized as a factor that drives vulnerability (Emmanuel *et al.*, 2014).

Effects of Flood Disaster to Crop Farmers

The mean of the result of the effects of flood disaster on the farmers as shown in figure 4.2 below showed that the crop farmers were in agreement with all the items analysed. Therefore, from the result, it can be inferred that flooding has negative impacts on the crop farmers and their livelihoods.

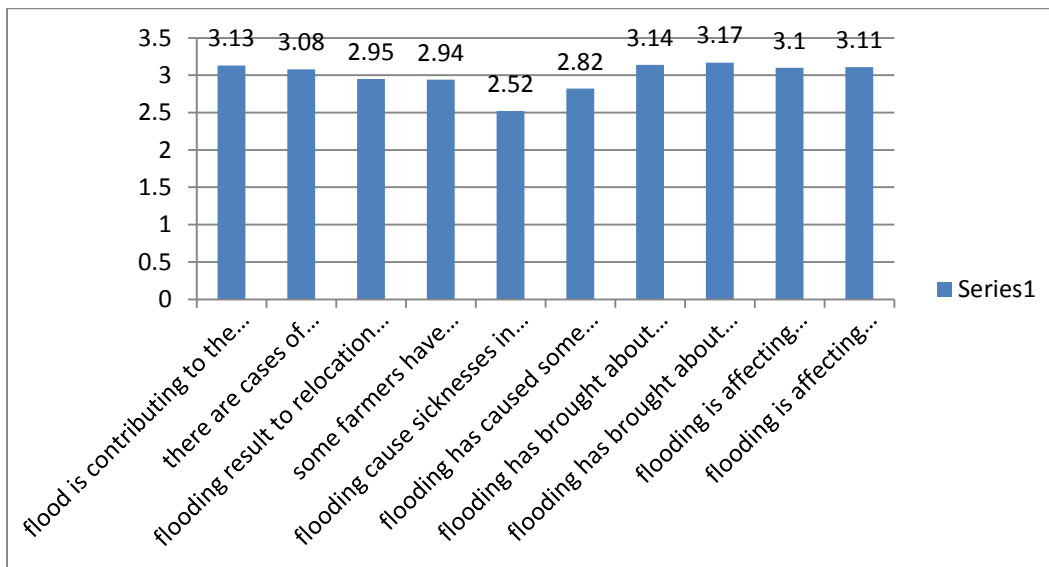


Fig: 4.2. Effects of flood disaster to crop farmers

The crop farmers in this study attest to the fact that flooding has negative impact on them and their livelihoods. This finding supports the proposition of Odunuga *et al.*, (2012); Atufu and Holt, (2018); Croitoru *et al.*, (2020). The result of the interview also revealed that flooding affects crop farmers in the study area. With Nigeria being the most populous nation on the African continent (Etuonovbe 2011), and 70% of this population living in poverty, any unrest or disasters such as flooding will have a huge impact (Agwu and Okhimamhe, 2009) especially on food security which is vulnerable to extreme

events such as flooding (Nzeh, *et al.* 2012). In this study, the farmers were of the opinion that flood is contributing to the destruction of farmland which is consistent with the study of Ajao and Oguniyi (2011) where they reported that floods damage farm land and can cause crop failure among small-scale farmers. It is necessary to know that Nigerian farmers are involved in agriculture on a substance level with majority of them being small scale farmers (holders) and is even more interesting to note that majority of these farmers do not actively take up insurance policies which would have given some sort of safety in the event of adverse and

unforeseen circumstances. This will make them to fall back upon nothing when there are unforeseen circumstances like flood (Ajibade, *et al.*, 2015). Also Abubakar (2020) declared that most of farmlands in their study area were submerged leading to heavy crop and livestock lost.

The above condition in addition with declining harvest and abandoning of farming due to flooding which the farmers were in agreement with, could exacerbate poverty and food insecurity in the study area. This is in consonance to the fact that it is obvious that agriculture is the mainstay of the people of the sub-saharan Africa. It has been established that more than 70 percent of Nigerian population is engaged in agriculture (Obasi and Agu 2002) while 90 percent of Nigeria total food production comes from rural farmers and 60 percent of the country's population earn their leaving from these small farms owned by rural dwellers. Flood water destroys farm crops by washing them away and also eroding the top soil thereby destroying farmland. Flood also carry off household items like stored grains and other harvested crops which are destroyed in the process (Idoko, 2016).

Conclusion and Recommendation

Flooding is one form of disaster capable of destroying lives, property and livelihood. Crop farmers like other persons are vulnerable to the effects of flooding because it affects their crops, farmland and general wellbeing. This research concluded that the crop farmers to a large extent have knowledge of flooding which is believed to be caused by rainfall and over flow from rivers. It is also believed that inadequate drainage and blockage of existing ones contribute to flooding in the State. This is due to the attitude of the people in depositing their waste in drainages with the believe that they will be drained away by rain water. In a similar vein, many newly settled areas do not have drainages to evacuate excess rainwater, thereby increasing the tendencies of flooding. Basically, the awareness of flooding by the crop farmers in Edo State will enable them to prepare and cope with the disaster whenever it occurs. This is paramount because it pose serious problems to them and their livelihoods which could aggravate poverty and food insecurity.

There should be enlightenment of the crop farmers and the public in general on the

effects of solid waste in drainages. This is to achieve attitudinal change of the common practice of disposing refuse in drains which could result to blockage and siltation thereby predisposing the area to flooding. There should be effective enforcement of legislation to prevent building structures on water ways. This is to enable free flow of water thereby reducing the incidences of flooding.

References

- Abubakar, B., Umar, H., Barde, M. M., & Adamu, S. (2020). Socio-economic Impact of Flooding on the riverine communities of River Benue in Adamawa State, Nigeria. *FUTY Journal of the Environment*, 14(2), 116-124.
- Agwu, J., & Okhimamhe, A., (2009). *Gender and climate change in Nigeria': A study of four communities in North Central and South-Eastern Nigeria*. Retrieved from www.ng.boell.org.
- Ahile, S.I. & Andityavyar, E.M. (2014). Household perception and preparedness against flooding in Makurdi town, Benue State, Nigeria. *IOSR Journal of Environmental Science, Toxicology and Food Technology*, 8(11), 1-6.
- Ajao A. O. and Ogunniyi L. T.,(2011). "Farmers strategies for adapting to climate change in Ogbomoso Agricultural zone of Oyo state. *AGRIS on-line Papers in Economics and Informatics*, 3(3), 3-13.
- Ajibade, E. T. Babatunde, R. O., Ajibade, J. B. & Ayinde, O. E. (2015). "Examining the impact of flooding on small-scale rice growers" per capita expenditure in Kwara state, Nigeria. *Proceedings of the 49th Annual Conference of the Agricultural society of Nigeria* ,, (pp. 250-253). Delta, Nigeria.
- Atufu, C. E. & Holt, C. P. (2018) Evaluating the impacts of flooding on the residents of Lagos, Nigeria. *WIT Transactions on the Built Environment*. 184, 81-90.
- Balica, S., Wright, N.G. and van der Meulen, F., (2012), 'A flood vulnerability index for coastal cities and its use in assessing climate change impacts'. *Natural Hazards* 64(1), 73–105
- Brown, J.D. and Damery, S.L. (2002) Managing Flood Risk in the UK: Towards an Integration of Social and Technical Perspectives. *Transactions of the Institute of British Geographers*, 27, 412-426.
- Croituru, L., Miranda, J. J., Khattabi, A., & Lee, J. J. (2020). *The cost of coastal zone degradation in Nigeria: Cross River, Delta and Lagos States*. World Bank, Washington, Retrieved from www.openknowledge.worldbank.org.
- Emmanuel, U. Unaegbu & Baker, K. (2014). Assessing community perception and attitude towards flooding in the Lower Benue River Basin, Nigeria. *Journal of Earth Science & Climatic Change* , 5 (6), 1-7.
- Etuonovbe, A. K. (2011). The Devastating effect of flooding in Nigeria. FIG Working Week 2011, Bridging the Gap between Cultures. Marrakech, Morocco, 18-22 May 2011. Available at www.fig.net.

- Fasina O. O. (2013). Farmers perception of the effect of aging on their agricultural activities in Ondo State, Nigeria. *The Belogradchik Journal for Local History, Cultural Heritage and Folk Studies*, 4(3), 371-387
- Granger-Morgan, M. (1995) Public Perception, Understanding and Values. In: Richards, D.J., Ed., *The Industrial Green Game: Implications for Environmental Design into Management*, National Academy Press, Washington DC, 200-2011.
- Harvatt J, Petts J, Chilvers J (2011) Understanding householder responses to natural hazards: flooding and sea-level rise comparisons. *Journal of Risk Research*, 14 (1), 63–83.
- Idoko I. D. (2016). An impact assessment of flooding on food security among rural farmers in Dagiri Community, of Gwagwalada Area Council, Abuja, Nigeria. *Agricultural Development*, 1 (1), 6-13.
- Kasali R., Ayanwale., & Williams S. B., (2009). "Farm location and determinants of agricultural productivity in the Oke-Ogun Area of Oyo State, Nigeria". *Journal of Sustainable Development in Africa*, 11(2), 1-19.
- Kreibich H, Thieken AH, Petrow T, Mu'ller M, & Merz B (2005.) Flood loss reduction of private households due to building precautionary measures—lessons learned from the Elbe flood in August 2002. *Natural Hazards and Earth System Sciences* 5,117–126.
- Maltais D. (2019). Elderly people with disabilities and natural disasters: Vulnerability of seniors and post trauma *HSSOA Journal of Gerontology and Geriatric Medicine*, 5(4), 1-7.
- Muhammad, N. (2015, September 20). National tragedy: Flood kills 53, displace 100,420 people across Nigeria. *Premium-Times Newspaper* Retrieved from www.premiumtimesng.com.
- Nzeh, E.C., Eboh, R.O., Eboh, E., Nweze N., Nzeh, C., Orebiyi, J., & Lemchi, J. (2015). Climate Change Adaptation In Nigeria And Its Challenges In agricultural Sector: Empirical Information. Retrieved from <http://www.academia.edu>.
- Obasi F. C. & Agu S. E. (2002). "Economies of small scale rice farmers under different production systems in South Eastern Nigeria," *Journal of Agriculture, Business and Rural Development*, 1, 2.
- Ocheri, M. & Okele, E., (2012). Social impact and people's perception of flooding in Makurdi town, Nigeria. *Hydrology for Disaster Management*, pp. 97–105.
- Odonuga S (2008) Urban land use change and the flooding in Ashimowu watershed, Lagos, Nigeria. University of Lagos, Nigeria.
- Okeleye S. O., Olorunfemi F. B. , S Ogbedji J. M. & Aziadekey M. (2016). Impact assessment of flood disaster on livelihoods of farmers in selected farming communities in Okeogun region of Oyo State, Nigeria. *International Journal of Scientific and Engineering Research*, 7(8), 67-83
- Oruonye, E.D. (2012). The challenges of urban flood disaster management in Nigeria: a case study of Jalingo LGA, Taraba State Nigeria *International Journal of Recent Scientific Research* 3, (1),37-42
- Oseni G., Goldstein M., & Utah A, (2013). *Gender dimensions in Nigerian agriculture*. Retrieve from www.openknowledge.worldbank.org.
- Owolabi, B (2013). Coping strategies of vulnerable people in flood disaster prone areas in Ibadan metropolitan city of Oyo state Nigerian. *Journal of Rural Sociology*, 13 (3), 19-26.
- Oyatayo, K.T., Songu, G.A., Adi, T.A., Jidauna, G.G. & Ndabula, C. (2016). Assessment of People's awareness and perception of flooding in Donga Town, Taraba State, Nigeria. *Journal of Geoscience and Environment Protection*, 4, 54-62.
- Salami, R.O., Von Meding, J.K. & Giggins, H., (2017) 'Vulnerability of human settlements to flood risk in the core area of Ibadan metropolis, Nigeria'. *Jamba Journal of Disaster Risk Studies*, 9(1), 1-14.
- Umar N. K. and Muazu A. (2017). Community perception and adaptation strategies toward flood hazard in Hayin-Gada, Dutsin-Ma Local Government Area, Katsina State, Nigeria). *Dutse Journal of Pure and Applied Sciences*, 3(1), 444-457.
- United Nations International Strategy for Disaster Reduction (UNISDR) (2012). *How to make cities more resilient: A handbook for Local Government Leaders*. Retrieved from <http://www.unisdr.org>
- Werner, M.G.F., Hunter, N.M. and Bates, P.D. (2006). Identifiability of Distributed Floodplain Roughness Values in Flood Extent Estimation. *Journal of Hydrology*. 314, 139-157
- Yamane, T. (1967). *Statistics, an introductory analysis*, 3rd Ed., Harper and Row Publishers, New York. p. 886.