Journal of Environment and Earth Science
ISSN 2224-3216 (Paper) ISSN 2225-0948 (Online)
Vol.5, No.4, 2015

Evaluating the Effects of Flooding in Six Communities in Awka Anambra State of Nigeria

Ebuzoeme, Ogechukwu Divine-Favour
Department of Architecture, School of Environmental Design and Technology, Federal Polytechnic Oko, Anambra State, Nigeria
E-mail: ogefavour280@gmail.com

Abstract
This study evaluated the effects of flooding in six Communities of Awka including Agulu, Amaenyi, Ezi-Awka, Amikwo, Ifite and Nkwelle. The questionnaire survey method was adopted in which questionnaire was employed in collecting the data from the respondents which was later collated and analyzed. The postulated hypotheses was tested using T-test and the result showed that there is no significant difference in the effects of flooding in the six communities studied in Awka. The study concluded therefore that the effects of the flooding in the six communities in Awka are the same, and some of the major effects of flooding in the communities in Awka include: road congestion, accident, damage of buildings, destruction of properties, health problems, reduction of aesthetic beauty of the environment, increase in poverty level and death. The study thus recommends that the masses be conscientized about these harmful effects of flooding in the area and their role in fighting flooding through a collaboration with the government and non-governmental organizations or an integrated approach. The awareness of the masses on the dangers facing them will cause them to take up their responsibilities and join forces with the government and non-gorvernmental bodies to contain the menace.

1.0 Introduction

1.1. Background of the Study

Floods are environmental hazards of meteorological phenomena, but very often induced by man's improper utilization or abuse of the physical environment. Flooding can be defined as an overflow that comes from a river or other body of water and causes or threatens damage. (Adebayo and Jegede, 2010). Floods are among the most dramatic forms of interaction between man and his environment. They occur both in the developed or developing world and are always associated with heavy loses of lives and properties, misery, hardship, diseases, and at times, famine.

Floods have benefits but also cause multiple problems. Floods occur world-wide, often after heavy rain in areas. Once the flood water clear away, it leaves behind a variety of different effects on the land, animals and people. While many people view flooding as having a solely negative effect, positive things can also result in aftermath of a flood. Flooding causes structural and environmental damage to landscape. Floods erode soil, often on a large scale bases. This displacement of soil leads to the weakening of structures like houses and bridges. Ebisemiju (1993), opines that the most significant impact of flooding arises from urbanization, because it involves deforestation, land-use changes, temperature modification of soil physical properties and structures and the exposure of bare soil surfaces especially of construction sites all of which bring about changes in the morphological and hydrological state of water.

Flood waters can destroy homes and businesses; disrupt road, rail and communication lines, and rain crops and agricultural land. Floods can also disrupt drainage and sewage systems, presenting a serious health hazard resulting from pollution and water borne-disease. Flooding of river is a natural phenomenon. The damage caused by flooding however has increased due to decreasing space for rivers and growing population pressure on valley grounds and wetlands It is now generally accepted that increasing urban coverage and other development have led to a worldwide increase in both the risk and economic burden of floods.

Flooding and excessive rainfall have caused massive erosion landslides and loss of soil nutrient in places in Anambra state especially Awka, resulting to other environmental problems.

1.2 Statement of Problem

Recently, in Northern Nigeria, flood displaced more than two million people as the flood gates on Challawa and Tiga dams were opened to release rising waters along the Niger River. Flooding has also affected at least 300,000 people, submerging hundreds of Communities in Niger State . Flooding has wreaked havoc across many other parts of Nigeria in recent years, including the following states: Anambra in the east, Sokoto in the northwest, Borno in the northeast, Plateau in the centre and Yobe in the north.

Over the years in Anambra State, flood has remained a worrisome natural problem which successive governments in the State could not effectively solve. Flood therefore is still a problem in areas like Awka, Oko, Onitsha, Agamelu, Aguleri, Umuleri, and Adani. In most areas of the state, such as Awka, Oko and Onitsha, flooding has posed a major concern to the occupants of properties. The access roads to some of these properties

during raining season are usually in their worse states and this deteriorates year after year. Flooding is inimical to human activities especially when it occurs on a large scale (Ogunyemi 2002). Flooding has been a threat in the study area, Awka the capital of Anambra State which has been experiencing flood disasters as a result of so many factors like lack of spaces for drainage system, blockage of the drainage system, unplanned building and businesses, poor environmental awareness, inadequate management of wastes, poor construction of drainage system, attitude of the residence towards wastes disposal etc all these help to aggravate flooding during rainy seasons in Awka.

Statistic have it that more than 28 buildings, including schools, churches, hospitals and residential homes, have been submerged by flooding in Awka, Anambra State following torrential rain which lasted for about three hours in July 2012, three churches, two primary/ nursery schools and two hospitals were most badly affected while no fewer than 90 families living within Owurah, Ezioka, Court Road, and Kwata Streets were rendered homeless, as their homes were taken over by flood water. Motorist always find it difficult to pass through the area during the rainy season this is evident along zik's avenue road by post office, many motorist are trapped in the flood.. In these areas many lives, properties worth of billions of naira have been damaged, accidents congestion and loss of aesthetics values and beauty of the environment becomes the other of the day, overcrowding, spread of communicable diseases and water-borne diseases like cholera, typhoid fever have become prevalent in the area, lives have been lost by car accidents as a result of damage roads, rate of crime and conflict increased as people resort to all kind of social vice in order to stay alive. It is to this effect that this study seeks to analyze the effects of flooding in Awka with a view to proffering solution to the menace.

1.3 Aim and Objectives

The aim of this research is to evaluate the effects of flooding in six Communities in Awka, Anambra State.

2.0 Literature Review

Effects of Flooding and Consequence of Flooding especially in the study area cannot be over emphasized. Mike Ahern, R. Sari Kovats, Paul Wilkinson, Roger Few, and Franziska Matthies, (2005) carried out a research on flooding in Mozambique in Bangladesh using questionnaire. They found out that floods are the most common natural disaster in both developed and developing countries, and they are occasionally of devastating impact, as the floods in China in 1959 and Bangladesh in 1974 and the tsunami in Southeast Asia in December 2004. Their impacts on health vary between populations for reasons relating to population vulnerability and type of flood event (Kovats et al, 2003). Under future climate change, altered patterns of precipitation and sea level rise are expected to increase the frequency and intensity of floods in many regions of the world (Intergovernmental Panel on Climate Change, 2001). In the paper, they review the epidemiologic evidence of flood related health impacts. The result showed that surprisingly limited evidence base about the health effects of floods, particularly in relation to morbidity were scarce. This may in part be due to the difficulty of carrying out rigorous controlled epidemiologic studies of floods, especially in low-income countries. Evidence on public health interventions (e.g., the need for measures to reduce the spread of infectious disease, dealing with mental health impacts, targeting of vulnerable groups) appears particularly limited. It was also found that there is no study on the effectiveness of public health measures, including early warning systems. Nonetheless, the wide range of risks to health and well-being, both physical and mental, is understood, though there remains scientific uncertainty about the strength of association and public health burden for specific health effects. The immediate risks of trauma and death are generally clear, but it seems that longer-term impacts, specifically on mental well-being, are often underestimated and probably receive too little attention from public health authorities.

2.1 Mortality

Deaths associated with flood disasters are reported in the EM-DAT disaster events database (Centre for Research on the Epidemiology of Disasters, Ecole de Sante´ Publique, Universite´ Catholique de Louvain, Brussels, Belgium) (Center for Research on the Epidemiology of Disasters, 2005) and also in two reinsurance company databases (www. munichre.com, www.swissre.com). These databases include little epidemiologic information (age, gender, cause), however. Flood-related mortality has been studied in both high- (Abrahams M. J,et al 1976) and low-income countries. The most readily identified flood deaths are those that occur acutely from drowning or trauma, such as being hit by objects in fast flowing waters. The number of such deaths is determined by the characteristics of the flood, including its speed of onset (flash floods are more hazardous than slow-onset ones), depth, and extent. Many drowning occur when vehicles are swept away by floodwaters (Dietz, Gunn, Rigau-Perez, 1990).

Evidence relating to flash floods in high-income countries suggests that most deaths are due to drowning and, particularly in the United States, are vehicle related (French, Ing, Von Allmen S, 1983). Information on risk factors for flood-related death remains limited, but men appear more at risk than women (Jonkman and Kelman, 2005). Those drowning in their own homes are largely the elderly. Although the risk of

deaths is most obviously increased during the period of flooding, in a controlled study of the 1969 floods in Bristol, United Kingdom, Bennet (Bennet 1968) reported a 50 percent increase in all-cause deaths in the flooded population in the year after the flood, most pronounced among those aged 45–64 years.
Few other studies have examined such a delayed increase in deaths, but it was also reported by Lorraine (Lorraine, 1954) in relation to the 1953 storm surge flood of Canvey Island, United Kingdom, but not in two Australian studies (Abrahams, Price,and Whitlock, 1976).

Inconclusive evidence for diarrheal deaths has been reported from several studies of floods in low-income countries. Surveillance data showed an apparent increase of mortality from diarrhea following the 1988 floods in Khartoum, Sudan, but a similar rise was also apparent in the same period (May–July) of the preceding year. Routine surveillance data and hospital admissions records similarly showed diarrhea to be the most frequent (27 percent) cause of death following the severe 1988 Bangladesh floods, but again the effect of the flood was not separately quantified from seasonal influences (Siddique, Baqui, and Eusof, 1988).

2.2 Injuries

Flood-related injuries may occur as individuals attempt to remove themselves, their family, or valued possessions from danger. There is also potential for injuries when people return to their homes and businesses and begin the clean-up operation (e.g., from unstable buildings and electrical power cables). In a community survey (108 of 181 households completed the questionnaire) of the 1988 floods in Nımes, France, 6 percent of surveyed households reported mild injuries (contusions, cuts, sprains) related to the flood (Duclos, Vidonne, and Beuf, 1988). In Missouri after the Midwest floods of 1993, injuries were reported through the routine surveillance system. Between July 16 and September 3, 1993, a total of 524 flood-related conditions were reported, and of these 250 (48 percent) were injuries: sprains/strains (34 percent), lacerations (24 percent), ‘‘other injuries’’(11 percent),and abrasions/contusions. Similar data were also reported from Iowa (Public health consequences, 1993).

Surprisingly little information is available on the frequency of nonfatal flood injuries, as they are mostly not routinely reported or identified as flood related. Fecal-oral disease in flood conditions, there is potential for increased fecal oral transmission of disease, especially in areas where the population does not have access to clean water and sanitation.

Published studies (case-control studies, cross-sectional surveys, outbreak investigations, analyses of routine data) have reported post flood increases in cholera (Korthuis, Jones, Lesmana, 1998 and Sur, Dutta, Nair, 2000), cryptosporidiosis, nonspecific diarrhea, poliomyelitis, rotavirus, and typhoid and paratyphoid. Some of the reported relative risks associated with flooding are substantial.

In Indonesia, for example, Vollaard et al. (2004) found flooding of the home to increase paratyphoid fever, with an odds ratio of 4.52 (95 percent confidence interval (CI): 1.90, 10.73), found it to increase the risk of cryptosporidiosis, with an odds ratio of 3.08 (95 percent CI: 1.9, 4.9). In high-income countries, the risk of diarrheal illness appears to be low, as shown by studies from the former Czechoslovakia and Norway (Avitsland, Iversen, and Krogh, 1996).

In the United Kingdom, (Reacher et al ,2004) reported an increase in self-reported gastroenteritis (RR 5 1.7, 95 percent CI: 0.9, 3.0) following the Lewes floods of 2001. Another US study (Mackowiak, Caraway, and Portnoy, 1976) investigated an outbreak of oyster-related hepatitis A and, although it was not possible to determine the precise cause of the outbreak, the authors hypothesized that flooding of the Mississippi Valley and discharge of fecal materials in the oyster-growing areas may have been factors.

2.3 Vector-borne disease

The relation between flooding and vector-borne disease is complex. Many important infections are transmitted by mosquitoes, which breed in, or close to, stagnant or slow-moving water (puddles, ponds). Floodwaters can wash away breeding sites and, hence, lower mosquito-borne transmission.

On the other hand, the collection of stagnant water due to the blocking of drains, especially in urban settings, can also be associated with increases in transmission, and there have been numerous such reports from Africa , Asia ,and Latin America.

The 1982 El Nino event, for example, caused extensive flooding in several countries in Latin America and apparently sharp increases in malaria (Cedeno, 1986) The Mozambique floods of 2000 also appeared to have increased the number of malaria cases by a factor of 1.5–2 by comparison with 1999 and 2001 (Kondo, Seo, and Yasuda, 2002), although the statistics are difficult to interpret in light of the major population displacement that the flood caused.

There have also been reported increases in lymphatic filariasis and arbovirus disease in Africa , Australia , Europe and the United States, although few provide epidemiologic data.

2.4 Rodent-borne disease

Diseases transmitted by rodents may also increase during heavy rainfall and flooding because of altered patterns of contact. Examples include Hantavirus Pulmonary Syndrome and leptospirosis. There have been reports of flood associated outbreaks of leptospirosis from a wide range of countries, including Argentina, Brazil, Cuba, India, Korea, Mexico, Nicaragua, Portugal and Puerto Rico (Sanders et al, 1966).

In Salvador, Brazil, risk factors for leptospirosis included flooding of open sewers and streets during the rainy season . After a series of tropical storms in 1995, two health centers in western Nicaragua reported cases of a fever-like illness and some deaths from hemorrhagic manifestations and shock (Trevejo, Rigau-Perez, and Ashford, 1995). Dengue and dengue hemorrhagic fever were initially suspected (74), but after a case-control study, Trevejo et al. (1995) concluded that the most likely explanation was increased exposure to floodwaters contaminated by urine from animals infected with Leptospira species. Although several articles implicate contact with floodwaters, specific analyses have not been presented.

2.5 Mental health

The World Health Organization recognizes that the mental health consequences of floods ‘‘have not been fully addressed by those in the field of disaster preparedness or service delivery,’’ although it is generally accepted that natural disasters, such as earthquakes, floods, and hurricanes, ‘‘take a heavy toll on the mental health of the people involved, most of whom live in developing countries, where [the] capacity to take care of these problems is extremely limited’’. Here, the main evidence relates to common mental disorder, post traumatic stress syndrome, and suicide.

Most studies on the effects of flooding on common mental disorders are from high- or middle-income countries, including Australia, Poland, the United Kingdom and the United States, but there is also a study from Bangladesh (Durkin, Khan, and Davidson, 1993). Bennet’s analysis of the 1968 Bristol floods found a significant increase (18 percent vs. 6 percent; $p < 0.01$) in the number of new psychiatric symptoms (considered to comprise anxiety, depression, irritability, and sleeplessness) reported by women from flooded compared with non flooded areas, although there was no significant difference for men. These results broadly agree with the findings for the 1974 Brisbane floods (Abrahams, Price, and Whitlock, 1976), except that in Brisbane men were also affected. Those between 35 and 75 years of age suffered the greatest impacts.

Flood exposure was associated with significant increases in depression ($p < 0.005$) and anxiety ($p < 0.0008$) (and also physical symptoms), especially in those with higher levels of pre-flood depressive symptoms and in those from lower socioeconomic groups-a finding that(Phifer et al. 1988) suggest supports Logue et al.’s 1981 assertion that ‘‘low-income people are more vulnerable to the adverse effects of a disaster’’ (Phifer, 1990).

(Ginexi, Weihs, and Simmens, 2000) were able to compare symptoms for depression in both the pre- and post flood periods, and they found that, among respondents with a pre flood depression diagnosis, the odds of a post flood diagnosis increased significantly (odds ratio 5 8.55, 95 percent CI: 5.54, 13.2). A more recent case-control study from the United Kingdom (Reacher, McKenzie, and Lane, 2004) found a fourfold increase in psychological distress among adults whose homes were flooded compared with those whose homes were not (RR 54.1, 95 percent CI: 2.6, 6.4).

On the other hand, more equivocal evidence comes from two case-control studies of the mental health impacts of Tropical Storm Agnes, which caused extensive flooding in Pennsylvania in 1972. The first study, conducted 3 years post flood, focused on working-class males aged 25– 65 years; the second, conducted 5 years after the event, focused on women aged 21 years or more. In both cases, respondents from flooded households reported more mental health symptoms than did non flooded respondents, but differences were not statistically significant. The authors speculate that ‘‘the failure to find a stronger relationship, may, in part, be the result of the length of time which had elapsed since the disaster impact’’ (Logue, Melick, and Struening, 1981).

Comparatively few studies have examined mental health impacts on children, but an exception is the 1993 study by Durkin et al. (1993) that found post flood changes in behavior and bedwetting among children aged 2–9 years. Before the flood, none of the 162 children were reported to be very aggressive; post flood, 16 children were found to be very aggressive toward others. Bedwetting increased from 16.8 percent before the flood to 40.4 percent after it. In the Netherlands, Becht et al. (1998) interviewed 64 children and their parents 6 months post flood and found 15–20 percent of the children having moderate to severe stress symptoms. Other studies after the 1997 floods in Opole, Poland , also suggest long-term negative effects on the well-being of children aged 11–14 years and 11–20 years, with increases in posttraumatic stress disorder (PTSD), depression, and dissatisfaction with life. Post-traumatic stress disorder. PTSD ‘‘arises after a stressful event of an exceptionally threatening or catastrophic nature and is characterized by intrusive memories, avoidance of circumstances associated with the stressor, sleep disturbances, irritability and anger, lack of concentration and excessive vigilance [and the specific diagnosis of PTSD] has been questioned as being culture-specific, and may be over diagnosed’’ (World Health Organization, 2006).

Nonetheless, studies showing increases in PTSD following floods come from Europe and North

America . (McMillen, North, and Mosley, 2002), who interviewed those affected by the 1993 Midwest floods, found that 60 subjects (38 percent) met the criteria for post flood psychiatric disorder and 35 (22 percent) met the criteria for flood-related PTSD.

However, the limitations, recognized by the authors, included retrospective data collection, self-selection of interviewees, self-reporting, and the absence of a control group. Similar limitations applied only to a study of 1997 flood victims in the Central Valley of northern California ,19 percent of the 128 participants who completed the acute stress disorder questionnaire met the criteria for the disorder's diagnosis, and of the 73 participants who completed the 1-year follow-up, seven (10 percent) met the criteria for full PTSD.

Studies of the 1996 flooding in the Saguenay/Lac St. Jean region of Quebec, Canada, also suggest substantial increases in emotional distress and PTSD among flooded respondents.

Furthermore, in Nigeria Kofo (2012) carried out qualitative studies of recent floods and sustainable growth and development of cities and towns in Nigeria and he found out that extreme weather events have caused havoc to lives and properties in recent years. Research and development have also been focused on these global phenomena and that the situation is getting alarmed in Nigeria. Using topographical maps of 25 cities and towns he studied the incidences of floods in Nigerian cities and towns.

Floods, drainage channels, run-offs and effects of human activities on floods were observed by him. He also used interviews conducted with 20 professionals, urban dwellers and twenty Local Government Chairmen of the cities and towns. There was a questionnaire that was administered among 2,000 urbanites. He collected data about the frequency, sizes and havocs caused by floods. The result showed that some of the cities particularly Lagos, Warri and Port-Harcourt are under the sea level with average gradient of less than 1:100,000. Run-offs are increasing in volume and areas of coverage but relatively drainage channels are inadequate; and they have been blocked through the adverse living habits of the urban dwellers. Waste waters are contributing as base water to rain water in the drainage channels. These result in grievous consequences of flood. All forms of transportation are affected each time it comes; lives, farm lands and properties are lost; and economic activities are grounded. Human factors are predominantly the cause. More attention has to be paid to urban physical planning.

(Eni *et al,* 2011) carried out a study of Flood and its Impact on Farmlands in Itigidi, Abi Local Government Area, Cross River State, Nigeria. They noted that flooding has significant impacts on global and regional food production particularly the common stable food crops performance in tropical sub-humid climatic zone. In their study they farm land was divided into fifteen (15) plots for easy analysis. A quadrant of 5Oni x 50m was demarcated and the different types of crop cultivated in the study area were identified. The depth of inundation of river water was measured a meter rule of 100ml. Soil samples were collected and taken to the laboratory to determine the soils physical properties. A semi Structured interview was held with 50 farmers.

The interview covered topics such as farm characteristics causes of floods, types of crops destroyed and factors influencing flood. The result reveals that plot 8 with degraded vegetables covered a total area. 175 hectare, also the crops was inundated to a depth of 15m. Crops such as water leaf, tomatoes, melon and cucumber were highly devastated. Cassava, pepper, potatoes and tomatoes were cu1tivated in soils with 69% sand content and has a textural class known as sandy loam. The mean of sand, silt and the clay content in the study area was 494.5, 18 and 15.8 respectively.

Ph value ranged from 5.10 -6.70. The above result showed that flooding had a significant impact on soil physio-chemical properties because organic matter and nutrients were leached down the soil. It was recommended that plant species that are tolerant to excess water inundation should be improved within the study area to ensure large scale crop production.

There is no doubt that the world is under serious threat from the environment: From China to Mexico, Indonesia, United States of America, United Kingdom and Nigeria, analysts have argued that the environment was only responding to the abuses heaped on it by man's activities (Christopherson, 1997). The concern is that the world may be getting close to extinction through natural disasters unless immediate actions are taken; and the signs are just too apparent to be ignored (Christopherson, 1997).

Specifically, in May 2008, floods triggered by torrential rains killed dozens of people across China, while thousands of others were victims of landslides caused by the downpours. China is not alone. In the United States of America, the Mississippi River caused damages put at several millions of dollars when it over flew its banks, flooding some cities, towns, farmlands and major industrial installations over a distance of about 250km and ravaging Iowa before it heaped downstream.

Apart from the Mississippi-Missouri River Systems of 1993, and that of 1995, world records of flood have it that recently severe floods were experienced in Norway, China, Bangladesh, Ghana, The Netherlands and South Florida, (Christopherson, 1997). In February 2000, a cyclone swept across Mozambique which left some 950,000 people homeless as floods devastated huge areas of low-laying lands. Roads, homes, bridges and crops were destroyed.

It is over 14 million Indians that were victims to the flood of August 2007 in Sathya Sai Baba, a major

human settlement, of that region. The nation's government could not organize any emergency relief immediately. Rather, it spent over $1.6 billion on Hawk Jets. Hunger and diseases stalked the India children and the poor in the region. In Nigeria, apart from the Ogunpa Stream in Ibadan that killed several people and completely grounded socio-economic activities in 1980, in August 2008, the residents of Makurdi were thrown out of their residences and their farmlands left impoverished after two days of heavy down pour of rainfall. It was described as very disastrous, (Taiwo, 2008). He also reported in This day (August 18th) that "at least five hundred people were rendered homeless and properties worth several millions of Naira were destroyed when a flood, occasioned by torrential rainfall ravaged Babura, a town in Jigawa State in a period of two days". Akani and Bilesanmi (2011) report how a Lagos flood forced Lagosians to relocate as a result of heavy rain of 7th and 8th of July 2011 not knowing there was going to be a more devastating torrential rain that will result in "more disastrous floods in Lagos Metropolis" in the following week. Often, "Send down the rain" is the supplications of Nigerians early in the years in expectation of bountiful harvests. In the recent years, the rains came indeed, but in torrents, giving rise to deadly floods instead, causing harvests of pains. From Lagos, Ibadan, Abeokuta, Calabar, Port-Harcourt and Warri in the southern region through Ilorin, Abuja, Lokoja and Mina in the Middle belt to Kano, Kaduna Jalingo, Maiduguri and Gombe in the North, the rains came down and floods came-up, washing away streets, battering dams, collapsing bridges, submerging buildings, killing people, trapping some in their homes and separating thousands of others from theirs.

However, from the whole old worldwide story from the book of Genesis (Genesis 7:4-10,) and the recent experiences and records, it is clearly known that a flood is a high water level that overflows the natural (and or artificial) levees along any portion of a stream. It is common throughout the world and it is a natural response of a river or stream or mere drainage valley/channel that has too much water to cope with. Heavy rainfall (combine with snow melt in the temperate regions) causes channels to be overtopped, and flood waters surge over the neighboring floodplain. It is usually "very large body of water covering the land that were usually dry and beyond its banks" - destroys farm lands, property, industrial installations, roads, railways, residences and it carries people away.

In other words, it is usually abrupt, accidental, destructive and harmful. It is usually very devastating to any community and our nation it affects economically and socially. Though, sometimes, it is not without some advantages (Pilgrim and Cordery, 1993) and (Aderogba, Oredipe, Oderinde and Afelumo, 2009).

Occurrences of floods in the cities and towns of Nigeria in recent times have been great concern and challenge to the people, Governments and researches. There have been journalistic and non-quantitative reports of flood for several parts of Nigeria including Lagos. But they are superficial and lack directions for professionals and policy makers (Aderogba, 2011). Above all, there is none, of recent, to describe the magnitude and criticality of the phenomena with the attendant problems. The works of Adeaga (2008), Oyegbile (2008) and Oyebande (1990 and 2005) are paraphrasing, disjointed or sectional. They are not laconic. Adeaga (2008) *Flood Hazard Mapping and Risk Management in Part of Lagos N.E* is only on mapping of the hazards caused by flood in the North Eastern part of Lagos Metropolis.

Similarly, the work of Aderogba (2011) on the *Challenges of Global Warming and Floods in Lagos Metropolis, Nigeria* is an expository of the poor planning of the physical environment of Lagos Metropolis and poor living habit of the residents vis-a-vis the resultant floods. The entire nation requires attention, More importantly, the frequency of occurrence and in several parts of the nation with the attendant havocs call for concern and serious attentions too.

Human activities such as dam construction, irrigation, bridges and others have impacted on free flow of water in the drainage channels, rivers and streams. Particularly at the urban centers, construction of roads, buildings, factories, manufacturing plants, farmlands and others have reduced their channels and or have attempted diversion of the natural courses of others. The vegetation cover typically reflects rainfall patterns, soil types and variations in altitude. In general, rainfall diminishes from the south and south-east towards the north. The coast has rain during all months of the year while the north has rain for approximately half of the months of the year. In the coastal regions, the annual rainfall is of the order of 4,000mm dropping to about 500mm in the extreme north. The assured supply of rainfall, especially during the rainy season, and the consistent high temperature throughout the year make for plant growth everywhere, (Afolabi, 1973).

But urban activities of man have changed the face of the earth. What is often found is man-made: Roof top of buildings, concrete surfaces and bare grounds. Road constructions, residential and commercial buildings, hospitals and maternity homes, schools and colleges, research institutes, markets and stores, filling stations and others demanded for concrete surfaces all of which have increased surface run off from rainfall and the wastes waters which have inadvertently added to the waters in the rivers, streams and drainage channels. Apart from those that are found dotting the outskirt of major cities and towns, manufacturing and other industrial processes and productions are most concentrated at the urbanized Lagos-Sango/Ota-Abeokuta-Ibadan industrial Axis, Kano-Kaduna-Jos Triangle, Asaba-Onitsha-Benin-Sapele-Warri Sector and Aba-Port-Harcourt-Enugu-Onitsha-Owerri Complex.

Similarly, Kofo, (2012) carried out a research titled "Global Warming and Challenges of Floods in Lagos Metropolis, Nigeria and found out that global warming and extreme weather events have caused havoc to lives and property in recent years. Research and development, workshops, conferences, seminars and others have also been focused on these global phenomena. In his research his studied the parameters of floods and effects of urbanization and living habits of the urban dwellers using questionnaire that was administered among 2,000 Lagosian to collected data about the frequency, sizes and havoc caused for most of the time it occurred. The result showed that the Metropolis is on low land with an average gradient of less than 1:100,000. Run-offs are increasing in volume and areas of coverage but relatively drainage channels are inadequate; and they have been blocked through the living habits of the urban dwellers.

Waste waters from homes, hospitals and maternity homes, markets, Schools and colleges, manufacturing industries and others are contributing as base water to rain water in the drainage channels. There are grievous consequences of flooding at some localities. All forms of transportation are affected each time it comes. Weather related disasters are becoming increasingly common. He suggested that the Lagosian and the governments should not allow global warming to compound the challenges of flood in the metropolis. Lagos state according to him needs proper drainage system maintenance, awareness on why people should not dump/block their drainage system.

Assessing the effects of flooding on residential property values in Lekki Phase 1, Lagos, Nigeria was carried out using survey approach. A total of 200 copies of the questionnaire were administered on the residents while 126 copies were retrieved (63%). Also, a total of 81 questionnaires were administered on Estate Surveyors and Valuers within Victoria Island and Lagos Island axis and 43 (53%) were retrieved. The data collected was analysed using both descriptive and inferential statistical tools. The study found that almost 70% of the properties are owner occupied; prominent causes of flood are drainage problems and rise in sea level.

The study further found that there is disparity in rental values of properties in flooded and non-flooded areas. The paired sample t-test conducted showed that there is statistically significant relationship between four pairs of the properties. The study therefore recommends that construction of drainage channels should be made wide enough to drain a large quantity of water.

Various studies had identified location, neighbourhood characters, property characters and environmental characters as factors affecting property values. Flooding in most cases are natural occurrence that damages life and properties whenever it occurs. Lekki Phase I, having experienced consistent flooding over the years.

2.7 Gaps In Literature

Amongst other areas not covered by the literature reviewed above, it is evident that none of the studies did an evaluation of the effects of flooding in Awka Anambra State of Nigeria to establish whether there is a significant effect of this problem on the environment or not. This work thus tried to fill this gap considering how long the area has been under this siege of flooding to enhance the provision of a lasting solution.

3.0 Methodology

The research adopted a questionnaire survey method in which questionnaire was employed in collecting the data from the respondents which was later collated and analyzed. The population figure of Awka is giving as 104,193 from the projected population of 2006 census (National Population Commission, 2006). To get the number of households in the study areas, the national average household size figure of 6 per family as recommended by the 2006 Population and Housing Census was used to divide the 2006 population of the communities in Awka which stand as 104,193. This gave 17,365.5 households for Awka and 22, 155 total percentage response (%) from six village in Awka, the frequency response is 12, 902.

The sample size for the study is 400. This was determined through the Yaro Yamine's formula (2001) which is given as:

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

Where S = sample size
N = No. of population
e = is the margin of error assumed(0.05)
1 = is the theoretical constant

No of population for Awka = 104,193 Source (NPC, 2006)

Sample size for Awka

$$S = \frac{104,193}{1 + 104,193\ (0.05)^2}$$

$$S = \frac{104{,}193}{1 + 104{,}193\ (0.0025)}$$

$$S = \frac{104{,}193}{261.483}$$

S = 0.398.5 x 100 = 398.5 = Approximate to 400.

Therefore, four hundred copies of questionnaire were distributed to residents in Awka metropolis in order to investigate the causes and environmental effects of flooding in the Awka Communities.

To make for random sampling , the streets within the study area were grouped into six clusters on the basis of the six groups that comprise the thirty-four Communities of the traditional area of Awka. Thus, the six clusters were established. They include: Agulu, Amaenyi, Ezi-Awka, Amikwo , Ifite and Nkwelle.

3.1 Result Presentation

Table 1 below, shows the sample size distribution for the six Communities/Towns studied

Table 1: Sample Size Distribution of Questionnaire

Towns	Number of questionnaires distributed	Number of questionnaire returned	Percentage returned rate (%)
Agulu	67	57	16.0
Amaenyi	67	61	17.1
Ezi-Awka	65	62	17.4
Amikwo	67	56	15.7
Ifite	67	62	17.4
Nkwelle	67	58	16.3
Total	400	356	99.9

Source: Author's Computation from Field work (2012).

This section treats the Environmental effects of flooding in Awka and it is presented on a frequency/ percentage table. Responses with high percentages in agree and strongly agree indicates that the respective effects were really experienced in the Communities as a result of flooding.

Table 2: The Effects of Flooding

S/N	ISSUES RAISED	FREQUENCY					PERCENTAGE				
1.	Road congestion	SA	A	NO	D	SD	SA	A	NO	D	SD
	Agulu	23	33	1	1	-	39.6	56.9	1.7	1.7	-
	Amaenyi	55	3	3	-	-	90.2	4.9	4.9	-	-
	Ezi-Awka	36	19	19	-	1	59.0	31.1	8.2	-	1.6
	Amikwo	26	15	15	6	-	45.6	26.3	17.5	10.5	-
	Ifite	25	30	30	1	-	41.0	49.2	8.2	1.6	-
	Nkwelle	26	23	23	6	1	44.1	39.0	5.1	10.2	1.7
2.	Accident	SA	A	NO	D	SD	SA	A	NO	D	SD
	Agulu	21	32	3	2	-	36.2	55.2	5.2	3.4	-
	Amaenyi	55	3	3	-	-	90.2	4.9	4.9	-	-
	Ezi-Awka	29	25	2	5	1	46.8	40.3	3.2	8.1	1.6
	Amikwo	28	21	3	5	-	49.1	36.8	5.3	8.8	-
	Ifite	29	19	4	7	2	47.5	31.1	6.6	11.5	3.3
	Nkwelle	27	18	3	7	4	45.8	30.5	5.1	11.9	6.8
3.	Damage of building	SA	A	NO	D	SD	SA	A	NO	D	SD
	Agulu	20	30	2	6	-	34.5	51.7	3.4	10.3	-
	Amaenyi	46	12	3	-	-	75.4	19.7	4.9	-	-
	Ezi-Awka	40	21	1	-	-	64.5	33.9	1.6	-	-
	Amikwo	27	21	6	2	1	47.4	36.8	10.5	3.5	1.8
	Ifite	50	7	1	2	1	83.0	11.5	1.6	3.3	1.6
	Nkwelle	33	14	2	7	-	58.9	25	3.6	12.5	-
4.	Destruction of properties	SA	A	NO	D	SD	SA	A	NO	D	SD
	Agulu	28	14	3	10	3	48.3	24.1	5.2	17.2	5.2
	Amaenyi	38	12	7	3	1	62.3	19.7	11.5	4.9	1.6
	Ezi-Awka	41	17	1	3	-	66.1	27.4	1.6	4.8	-
	Aamikwo	39	12	2	2	1	69.6	21.4	3.6	3.6	1.8
	Ifite	54	3	1	2	-	90	5	1.7	3.3	-
	Nkwelle	32	13	2	10	2	54.2	22.0	3.4	16.9	3.4
5.	Health problem	SA	A	NO	D	SD	SA	A	NO	D	SD
	Agulu	27	13	11	3	4	46.6	22.4	18.9	5.2	6.9
	Amaenyi	35	19	5	1	1	57.4	31.1	8.2	1.6	1.6
	Ezi-Awka	16	30	11	3	2	25.8	48.4	17.7	4.8	3.2
	Amikwo	37	14	2	2	1	66.1	25	3.6	3.6	1.8
	Ifite	26	23	5	2	3	44.1	38.9	8.5	3.4	5.1
	Nkwelle	21	16	6	13	1	36.8	28.1	10.5	22.8	1.8
6.	Reduction in aesthetic beauty of the environment	SA	A	NO	D	SD	SA	A	NO	D	SA
	Agulu	25	30	3	-	-	43.1	51.7	5.2	-	-
	Amaenyi	45	7	6	3	-	73.8	11.5	9.8	4.9	-
	Ezi-Awka	25	36	-	1	-	40.3	58.1	-	1.6	-
	Amikwo	31	22	3	-	-	55.4	39.3	5.4	-	-
	Ifite	38	17	1	3	1	63.3	28.3	1.7	5	1.7
	Nkwelle	22	19	6	9	1	38.6	33.3	10.5	15.8	1.8
7.	Increase in poverty level	SA	A	NO	D	SD	SA	A	NO	D	SD
	Agulu	28	23	7	-	-	48.3	39.7	12.0	-	-
	Amaenyi	39	9	10	3	-	63.9	14.8	16.4	4.9	-
	Ezi-Awka	22	19	14	7	-	35.5	30.6	22.6	11.3	-
	Amikwo	31	17	3	6	-	54.4	29.8	5.3	10.5	-
	Ifite	20	37	2	2	-	32.8	60.6	3.3	3.3	-
	Nkwelle	21	18	5	11	3	36.2	31.0	8.6	18.9	5.2
8.	Leading to death	SA	A	NO	D	SD	SA	A	NO	D	SD
	Agulu	23	32	3	-	-	39.7	55.2	5.2	-	-
	Amaenyi	44	14	3	-	-	72.1	22.9	5.0	-	-
	Ezi-Awka	40	20	-	1	1	64.5	32.3	-	1.6	1.6
	Amikwo	32	24	1	-	-	55.2	41.4	1.7	-	1.7
	Ifite	38	22	1	-	-	61.3	35.5	1.6	-	1.6
	Nkwelle	27	19	3	5	5	45.8	32.2	5.0	8.5	8.5

Source: Author's computation from Field work (2012)

Table 2, shows the information on the consequences of flooding in Awka.

From the table, majority of the people in Amaenyi Awka said that road congestion is one of the consequences of flooding in Awka with 90.2% of the responses. At Agulu Awka more than 85% of the respondent strongly agreed that road congestion is one of the causes of flooding in the area while at Ezi-Awka

more than 80% of the respondents were of the opinion that road congestion is a major consequences of flooding in the area. Amikwo, Ifite and Nkwelle Awka were also strongly of the opinion that road congestion is one of the consequences of flooding in the study area, this accounts for 70.3%, 90.2% and 80.1% respectively.

From the Table 2 above, respondents in Awka strongly agreed that accident is one of the consequences of flooding in Awka. Their responses are as follows; Agulu Awka, Amaenyi and Ezi-Awka, 81.3%, 95.1% and 87.1%. At Amikwo, Ifite and Nkwelle Awka, their responses is as follows; 85.9%, 78.6% and 76.3%. The above result showed that accident is a major consequence of flooding in the study area.

Again from table 4.4 above, it was noticed that flooding damage buildings in Awka. From the table, majority of the respondents strongly agreed that flooding can damage buildings in Awka. At Agulu Awka, Amaenyi and Ezi-Awka the percentage of their responses were 86.1%, 95.1% and 98.4% respectively and for Amikwo, Ifite and Nkwelle Awka the percentage of their responses were 84.2%, 93.5% and 83.9% respectively. It was also observed from the table that some of the respondents were of the opinion that flooding does not damage building and this percentage account for 12.5%, 4.9%, 7.3% and 10.3% respectively. Based on this, it can be seen that flooding can cause building damage in Awka.

From Table 2 above, responses on whether flooding could cause destruction of peoples properties were ascertained. From the table, it was noticed that majority of the respondents strongly agreed that flooding causes destruction of peoples properties in Awka. At the six selected Communities the results of their responses showed that actually, flooding leads to destruction of people's properties in Awka. The evidence can be seen from the percentage of their responses which is as follows; Agulu Awka, Amaenyi and Ezi-Awka showing 72.3%, 72.0% and 93.5% respectively and for that of Amikwo, Ifite and Nkwelle Awka, the result of their responses were 91.0%, 95% and 76.2% respectively. From the above table, it was observed and strongly believed that flooding can cause building destruction in the study area.

Table 2, shows that flooding can cause health problems to the resident of the study area. From the responses, it was noticed that flooding actually could cause health problems to the residents. This was proved from the responses seen in the six selected Communities in the study area. Majority of the respondents strongly agreed that flooding could have health effect on the resident of the study area. Their responses accounts for more than 99% of the population in the study area.

From Table 2, it was observed that flooding reduces the aesthetic beauty of the environment. Majority of the respondents were strongly of the opinion that flooding reduces the aesthetic beauty of the environment 78.3% in amaenyi, 51.7% agreed in Agulu, 58.1% agreed in Ezi-Awka, while 55.4%,63.3% and 38.6% of the respondents strongly agreed in Amikwo, Ifite and Nkwelle Communities respectively; while majority strongly disagreed on this opinion.

In Table 2, respondents were of the opinion that flooding greatly increases poverty level in Awka. According to the table, more than 90% of the respondents strongly agreed that flooding increases the level of poverty in the study area, but less than 30% of the respondent disagreed that flooding could result to increase in poverty level in the study area. Taking from the result, the number of those that disagree is too minuet and therefore, flooding increases the level of poverty in the study area.

The Table 2, went further to illustrate that flooding could lead to death using the percentage of the responses of the respondents in the study area. From the table, more than 99% strongly agreed that flooding can lead to death and therefore should be controlled for sustainability.

Test of Hypothesis and Statistical Analysis

Hypothesis

Ho: There is no significant difference between the environmental effects of flooding in the six communities in Awka.

The hypothesis was tested using the T-test. This compared the various environmental effects of flooding in the six communities in Awka. The result is shown in Table 3 (a), (b) and (c)

Table 3: T-Test for Effects of Flooding

(a) Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Agree Effect	3.0600E2	8	18.46232	6.52741
	Disagree Effect	25.3750	8	10.08446	3.56540

Source: Author's Computation from field work (2012)

(b) Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 Agree Effect & Disagree Effect	8	-.811	.015

Source: Author's Computation from field work (2012)

(c) Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Agree Effect - Disagree Effect	2.80625E2	27.28651	9.64724	257.81291	303.43709	29.089	7	.000

Source: Author's Computation from field work (2012)

Decision Rule:
Reject the null hypothesis if the p – value is greater than or equal to 0.05, otherwise accept it.
The interpretation of the work:
The overall responses of the respondents were checked, and it was found that the p – value is 0.000 which is below 0.05. This means that we accept the null hypothesis and conclude that there is no significant difference in the effects of flooding in Awka.

4.0 Summary of Findings

From the result of the statistical analysis, it was found that there is no significant difference in the effects of flooding in Awka, in other words the rate at which the menace is affecting each of the six communities studied does not significantly differ from one another.

4.1 Conclusion and Recommendation

From the above, the study concluded that the effects of the flooding in the six communities in Awka are the same, and some of the major effects of flooding in the communities in Awka include: road congestion, accident, damage of buildings, destruction of properties, health problems, reduction of aesthetic beauty of the environment, increase in poverty level and death.
Sequel to the above findings and conclusion, the study recommends the following to better check this flood menace in the area:

1. The masses should be conscientized about these harmful effects of flooding in the area and their role in fighting flooding through a collaboration with the government and non-governmental organizations or an integrated approach. The awareness of the masses on the dangers facing them will cause them to take up their responsibilities and not dodge them. Some the responsibilities of the masses in managing the flooding problem are contained in the following points (2-6)
2. There is need for massive campaign against improper dumping of refuse in the drainage system as it not only create room for flooding but also encourages flooding in the area
3. That sorting of waste before disposal could effectively reduce the effect of flooding in Awka
4. Construction of sound drainage system is highly needed in controlling and checking flooding in Awka.
5. There is need for creating environmental awareness to keep the drainage systems from waste dumps could help in providing lasting solution to environmental problems of flooding in Awka.
6. People should be encouraged to open their drainage system constantly in order to help check and control flooding in an area especially in Awka.

References

Abrahams, M.J., Price, J. and Whitlock, F.A. (1976). "*The Brisbane floods, January 1974: their Impact on*

Health" Medical Journal, Vol. 2 No. 93, Pp. 6-9.

Adeaga, O. (2008). "*Flood Hazard Mapping and Risk Management in Parts of Lagos"*. Department of Geography, University of Lagos Akoka, Lagos, Nigeria. (http://www.gsdi.org/gsdi10pages/Ts.13paper.pdf)

Adebayo,W.O. and Jegede,A.O. (2010)." The Environmental Impact of Flooding on Transportation Landuse in Benin City, Nigeria. African Research Review, Pp 390-400.

Aderogba, K. A. (2011). "*Global Warming and Challenges of Flood in Lagos Metropolis, Nigeria"*. Academic Research International. Vol. 2, No. 1, Pp. 448-468.

Aderogba, K., Oredipe, M., Oderinde, S. and Afelumo, T. (2009). "*Challenges of Poor Drainage Systems and Floods in Lagos Metropolis, Nigeria"*.International.

Afolabi, O. (1973). "*Study Notebook*". West Africa. London: Collins Pp. 25-27.

Ahern, M., Kovats, R., Wilkinson, P., Few, R. and Matthies, F. (2005)." Global Health Impacts of Floods". Epidemiological Reviews. Vol.27,No.1,Pp. 36-46.

Akanni, O. and Bilesanmi, L. (2011). "Flood: Lagos Residents Forced to relocate Drowning Teenager Rescured" in Vanguard: Towards a Better Life for the People. Lagos: Vanguard Media Limited. (Friday, July10), Pp. 20.

Avitsland, P., Iversen, B.G. and Krog, T. (1996). *"Infections During the 1995 Flood in Ostlandet. Prevention and Incidence*". (In Norwegian). Tidsskr Nor Laegeforen. Vol. 116 No. 20, Pp. 38–43.

Becht, M.C., Van Tilburg, M.A. and Vingerhoets, A.J. (1998). *"Flood: a Pilot Study on the Consequences for Well-being and Health of Adults and Children*". Vol. 40, No. 2, Pp. 77–89.

Bennet, G. (1968). "Controlled Survey of Effects on Health of Local Community Disaster". *Br*itish *Medical Journal,* 1970. Vol.3, No.45, Pp.4–8.

Cedeno, J.E.M. (1986). "*Rainfall and Flooding in the Guayas River Basin and its Effects on the Incidence of Malaria 1982–1985"*. Disasters 1986. Vol. 10 No. 10 Pp. 7–11.

Center for Research on the Epidemiology of Disasters. EMDAT: the OFDA / CRED International Disasters Data Base. Brussels, Belgium: School of Public Health, Universite´ Catholique de Louvain, 2005. (http://www.em-dat.net/).

Christopherson, R. W. (1997). "Goesystems: An Introduction to Physical Geography". London: Prentice – Hall. (Third Edition). Pp. 423

Dietz, V.J., Gunn, R.A. and Rigau-Perez J.G. (1990). "*Health Assessment of the 1985 Flood Disaster in Puerto Rico"*. Disasters 1990. Vol.14, No.1, Pp. 64–70.

Duclos, P., Vidonne, O. and Beuf, P. (1988). *"Flash Flood Disaster: Nıˆmes, France, 1988". European Journal of Epidemiol*ogy. Vol. 7, No. 3, Pp. 65–71.

Durkin, M.S., Khan, N. and Davidson, L.L. (1993). "*The Effects of a Natural Disaster on Child Behaviour: Evidence for Posttraumatic Stress"*. American Journal of Public Health. Vol. 83, No. 15, Pp. 49–53.

Ebisemiju, F.S. (1993). "Environmental Hazards. In Ebisemiju (Ed), Ado- Ekiti region": A Geographical Analysis and Master Plan. Ado- Ekiti, Nigeria. Alpha Prints.

Eni, D.I., Atu, J.E., Oko, C.O. and Ekwok, I. (2011)."*Flood and its Impact on Farmlands in Ltigidi, Abi Local Government Area, Cross River State*, *Nigeria". International Journal of Humanities and Social Science* Vol. 1 No. 9 pp 98-104.

French, J., Ing, R. and Von Allmen, S. (1983). "Mortality from Flash Floods: A Review of National Weather Service Reports, 1969–81". Public Health Rep 1983. Vol. 98, No. 58, Pp. 4–8.

Ginexi EM, Weihs K, Simmens SJ, (2000). "*Natural Disaster and Depression: a Prospective Investigation of Reactions to the 1993 Midwest Floods"*. American Journal of Community Psychology. Vol. 28 Pp. 495–518.

Intergovernmental Panel on Climate Change. (2001). "*Climate Change Impacts*, *Adaptation, and Vulnerability"*. Cambridge, United Kingdom: Cambridge University Press, 2001.

Jonkman, S. and Kelman, I. (2005). "An Analysis of Causes and Circumstances of Flood Disaster Deaths". Disasters 2005. Vol. 29, Pp. 75–97.

Kofo A Aderogba (2012). "Qualitative Studies of Recent Floods and Sustainable Growth and Development of Cities and Towns in Nigeria". International Journal of Academic Research in Economics and Management Sciences, Vol. 1, No. 3, Pp 2226-3624.

Kondo H, Seo N, Yasuda T, (2002). "Post-flood-Infectious Diseases in Mozambique". Prehospital Disaster Med 2002. Vol. 17, No.1, Pp.26–33.

Korthuis PT, Jones TR, Lesmana M, (1998). "An Outbreak of El Tor Cholera Associated with a Tribal Funeral in Irian Jaya, Indonesia". Southeast Asian J Trop Med Public Health 1998. Vol.29, No.55, Pp.0–4.

Kovats, S., Ebi, K.L. and Menne, M. (2003). "Health and Global Environmental Change: Methods of assessing human vulnerability and public health adaptation to climate change". World Health Organization, Denmark.

Logue, J.N., Melick, M.E. and Struening, E.L. (1981). "A Study of Health and Mental Health Status Following a Major Natural Disaster". Community Mental Health. Vol.2, No.2, Pp.17–74.

Lorraine, N.S (1954). "*Canvey Island Flood Disaster"*. February, 1953. Medical Office, 1954. Vol. 91, Pp. 59–62.

McMillen, C., North, C. and Mosley, M (2002). "*Untangling the Psychiatric Comorbidity of Posttraumatic Stress Disorder in a Sample of Flood Survivors*". Comprehensive Psychiatry 2002. Vol. 43, No. 4, Pp. 78–85.

National Population Commission, (2006). "Nigerian National Population: Interim Results". Abuja: National Population Commission.

Ogunyemi, E.S. (2002). "The Menace Flood". A Case of Surulere Local Government. Lagos, Nigeria: Yaba College of Technology Press.

Oyebande, L. (1990). "*Aspects of Urban Hydrology and the Challenges of African Urban Environment*". African Urban Quarterly. Vol. 5, No. 1-2, Pp.39 - 63.

Oyebande, L. (2005). "*The Challenges of Efficient Management of Water Supply and Drainage for the Coastal City of Lagos*". In A. A. Dragon (Ed.) Sustainable Water Management Solution for Lager Cities. Proceedings of International Symposium on Sustainable Water". International Journal of Academic Research in Economics and Management Sciences. June 2012, Vol. 1, No. 3.

Phifer, J.F., Kaniasty, K.Z. and Norris, F.H. (1988). "*The Impact of Natural Disaster on the Health of Older Adults: a Multi-wave Prospective Study". Journal of Health and Social Behaviour* . Vol. 29, Pp. 65–78.

Phifer, J.F. (1990). "*Psychological Distress and Somatic Symptoms after Natural Disaster: Differential Vulnerability among Older Adults"*. Psychological Aging. Vol. 5, No. 4, Pp. 12–20.

Pilgrim, D. H. and Cordery, F. S. (1993). "Flood Runoff" in D. R. Maidment (Ed.) *Handbook of Hydrology*. New York: McGraw-Hill Inc. pp 9.1 – 9.42.

"Public Health Consequences of a Flood Disaster Iowa, (1993)". Morbidity Mortal Weekly Report 1994. Vol. 42, No. 65, Pp. 3-6.

Reacher, M., McKenzie, K. and Lane, C. (2004). "*Health Impacts of Flooding in Lewes: a Comparison of Reported Gastrointestinal and other Illness and Mental Health in Flooded and Non-flooded Households"*.Communicable Disease Public Health 2004. Vol. 7 Pp. 56–63.

Sanders, E.J., Rigau-Perez, J.G. and Smits, H.L. (1966). "*Increase of Leptospirosis in Dengue-Negative Patients after a Hurricane in Puerto Rico in 1966*". American Journal of Tropical Medical Hygiene. Vol. 61 Pp. 399–404.

Siddique, A.K., Baqui, A.H. and Eusof, A. (1988). "*Floods in Bangladesh: Pattern of Illness and Causes of Death". Journal of Diarrhoeal Disease Research*. Vol. 9, No.3, Pp. 10–14.

Sur, D., Dutta, P. and Nair, G.B. (2000). "*Severe Cholera Outbreak Following Floods in india*". *Indian Journal of Medical Research*. Vol. 112, No. 1, Pp. 78–82.

Taiwo, O. (2008). "*Flood Sacks 500 in Babura*" in Thisday Vol. 13 No. 4867. Pp.18.

Trevejo, R.T., Rigau-Perez, J.G. and Ashford, D.A. (1995). "*Epidemic Leptospirosis*
Associated with Pulmonary Hemorrhage Nicaragua". Journal on Infectious Diseases. Vol. 178 No.14 Pp. 57–63.

Vollaard, A.M., Ali, S. and Van Asten, H.A. (2004). "Risk Factors for Typhoid and Paratyphoid Fever in Jakarta, Indonesia". Vol. 291, pp. 2607–15.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar