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Impact of Floods on Lives and Livelihoods of People in Akungba-Akoko, Ondo State, Nigeria.

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ABSTRACT
Flooding has been a seasonal challenges in Akungba-Akoko in Ondo State in recent times. The study area experience flood regularly most especially during and after rains. This study assesses how Akungba-Akoko have been affected by flood as it takes a look at the devastating impacts on lives and livelihoods of people. Data were collected through the use of structured questionnaire from the respondents. A total of three hundred and fifty (350) questionnaires were administered to the respondents in the study area. The questionnaires were distributed using the systematic random technique at interval of ten housing units. Data collected were analyzed through the use of descriptive statistical analysis and presented using tables. The study reveals that the major cause of flood in the study area was high intensity of rainfall (19.4%) followed by indiscriminate waste disposal (18.9%). Also, blockage of natural and artificial waterways (17.7%) and proximity of houses to riverbanks (16.6%) have contributed to the regular occurrence of flood in the area. Poor drainage system (15.1%) and improper planning and poor land use (12.3%) also contributed to flood in the area. The study recommends enforcement of environmental laws that will restrict dumping of waste into the water body and sponsoring of public awareness and educative programs on how man's activities has contributed to flood occurrence.

KEYWORDS: Floods, Causes, Impacts

I. INTRODUCTION

Flood is the most common natural disasters, their frequency, magnitude and the cost of damage are on the rise all over the world. Flood is a body of water which overflow swathes of land not normally inundated (Duru et al., 2014). Flooding, according to Geo-science Australia (2013) can simply be described as "water where it is not wanted". It can also be conceptualized as a situation that results when a part of the earth surface that is usually dry is inundated and covered with water due to high amount of rainfall or the over flowing of a water body. Flooding is a general temporary condition of partial or complete inundation of normally dry areas from overflow of inland or tidal waters or from unusual and rapid accumulation or runoff (Jeb and Aggarwal, 2005). Documental evidence showed that it all started with the Noachian deluge when the surface of the earth was submerged by water orchestrated by unabated torrential rainfall which led to the extermination of mankind with the sole exclusion of Noah's household (Olatona et al., 2017). The forgoing narrative thus suggest the necessity on the part of man to mitigate the effects of flooding in his environment by ensuring that all vulnerable landscape is identified and precautionary measures are put in place to tackle the impending challenge headlong.

In Nigeria, floods cause almost 90% of damages resulting from natural hazards Adeoye et al., 2009). Flooding are common features in Nigeria which occurs in towns on flat or low lying terrain especially where little or no provision has been made for surface drainage or when existing drainage has been blocked with municipal waste, refuses and eroded soil sediments (Folorunsho and Awosika, 2021).

The effects of floods are always debilitating, though their intensity and scope vary depending on terrain, intensity of human activities, quantum of water and the level of preparedness by the stakeholders. Flooding is a global phenomenon

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ravaging both the developed and developing nations with its deleterious effects sparking serious attention; which has become subject of research interest among climatologist, hydrologist, economist, urban planner and other professionals in the built environment. This is not unconnected to the fact that it is the most common and destructive of all natural hazards with wide reaching effects, wrecking havocs to the built and natural environments, as well as, endangering human health and material possessions (Saleh, 2014).

The complexity of anthropogenic activities of man without adequate attention to geological structure of most cities of developed and developing nations has undoubtedly contributed to reoccurrence of disaster and consequently poses threat to environmental sustainability in most of these nations (Oludare et al., 2012). This irrefutably has led or accumulated to unresolved challenges. Among the unresolved challenges being faced are vicious flood incidences experienced in the last four decades. The occurrence is stern in third world countries where there is intensity in land use, haphazard development, and unprecedented urbanization among others. Consequently, there has been unprecedented occurrence of floods and its associated negativities in most of the urban centers of developing countries (Montoya Morales, 2002). For instance, in Nigeria, reports have shown that devastating flood disaster had occurred in Ibadan (1985, 1987, 1990, and 2011), Osogbo (1992, 1996, 2002, and 2010), Yobe (2000), Akure (1996, 2000, 2002, 2004 and 2006) and the coastal cities of Lagos, Ogun, Port Harcourt, Calabar, Uyo, Warri among others (Olaniran, 1983). This claimed many lives and properties worth millions of Naira.

Several anthropogenic factors have contributed to the incidence of flood. Among these factors is the encroachment of development to flood prone areas. The incursion into such areas have being progressive until now because of unprecedented urbanization and industrialization which has undoubtedly resulted into large scale massive deforestation, loss of surface vegetation and farmlands. According to Okechuckwu (2008); "the incursion of unplanned and uncontrolled development into urban infrastructure facilities, violate the major objectives of physical planning and consequently result into misuse of land thereby creating disorderly arrangement of urban landscape and the occurrence flood that is mostly evident in cities of third world countries".

In Nigeria, the incidents of flood is becoming a reoccurring decimal in most urban area leading to colossal loss of properties and lives. For example in 1973, 1974 and 1976, cases of floods were recorded in Ilorin (Jimoh, 1999; Mordi, 2011 and Amaize, 2011) in 1973, 1980 and 2011 Ogunpa flood in Ibadan occurred. Floods in low-lying coastal areas, such as Lagos, Port Harcourt, Warri, Sapele and Yenegoa, as well as the hinterland and arid semiarid places like Ondo, Ilorin, Makurdi, Kaduna, Minna, Borno and Gombe have formed Nigeria newspaper headlines. Concern over the incidents of floods, especially in urban areas, have attracted several studies focusing on different aspects (Akintola, 1978; Akintola, 1982; Odemerho, 1983; Ayoade and Akintola, 1980; Babatolu, 1997; Oriola, 2000; Ologunorisa, 2004; Ali, 2005; Ologunorisa and Tersoo, 2006; Aderogba, 2012 and Aderogba *et al.*, 2012).

In Akungba-Akoko, flooding has been one of the major natural disasters which normally leads to loss of lives and properties, inundation of institutions, farmlands and destruction of roads. More so, with the increasing occurrence of this natural event and the various effect in the area, it is imperative to know the various activities and factors exposing the people to flooding in the study area. It is against this background that the study aim to assess the impact of flooding on the people's lives in Akungba-Akoko.

Specifically the study:

i. Describe the socio-economic characteristics of the people of the study area
ii. Identify the frequency of flooding in the study area
iii. Investigate the causes of flooding
iv. Determine the impact of flooding on the respondents.

II. LITERATURE REVIEW

Floods are the most common naturally occurring hazard and are responsible for a greater number of fatalities globally (Doocy et al., 2013). Flooding is a common phenomenon all over the world. It is more rampant and distressing in the developing countries like Nigeria (Andjelkovic, 2001). Floods are a result of excess water flowing on land that used to be dry (Djimesah, Okine and Mireku, 2018). According to Ajie and Frank (2019), it is regarded as the worst natural disaster across the globe responsible for one-third of all natural exigencies with grave impairments on infrastructure, the built environment and human life. It becomes a source of concern to all and sundry looking at the fact that, whether developed or developing, no nation is immune to incidents of flooding.

The European Union (EU) Floods directive (2007), defines a flood as a temporary covering by water of land that is not normally covered by water.

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Flooding is normally caused by natural weather events as heavy rainfall and thunderstorms over a short period, prolonged rainfall or extensive rainfall. It can also be caused by high tide combined with stormy conditions. Flood may also result from overflowing of a great body of water over land and extreme hydrological events or an unusual presence of water on land to a depth which affects normal activities (Olajuyigbe, 2012).

Among natural disasters, floods have been reported to be responsible for almost half of casualities (EMODAT, 2011). Floods are also the most frequent natural disasters affecting over 2.8 billion people in the world and causing 200,000 deaths over the past three decades (Hashizume, 2013). Between 1995 and 2015, the lives of 2.3 billion people were affected, making floods accountable for 47% of all weather related disaster globally (UNISDR, 2015). The social disruptions cause by flood can seriously undermine the quality of life of individuals and impression on the fabric of affected communities (Gordon, 2004). Flood in more than 80 countries has killed millions of people and caused hardships for more than 17million worldwide since the beginning of 2002. The effects of flood on man cannot be overemphasized because it cut across all spheres of man's life. This includes man's physical environment, man's health and agriculture products. Flood, depending on its volume and velocity can damage any type of structure, including bridges, cars, buildings, sewerage systems, roadways, and canals. It can also result into contamination of water (Aliyu and Suleiman, 2016). The consequence of this is unhygienic condition in the affected areas making the victims vulnerable to water-borne diseases such as; cholera, dysentery, typhoid. Crops and food supplies are often affected and consequently resulting to shortage of food crops resulting from loss of entire harvest. Its effect is also obvious on trees thereby causing non-tolerant species to die from suffocation. It also affects transportation system by destroying transport links. Conversely, lowlands near rivers depend upon river silt deposited by floods to improve the nutritional value to the local soil (Adebayo and Jegede, 2010). Factors that cause flood events are complicated and interrelated (Halgamuge and Nirmalathas, 2017). Floods are naturally caused by rise in temperature resulting in heavy downpour of rain, glacier melt and thermal expansion of the ocean subsequently causing a rise in sea levels and inundation of coastal lands (Etuonovbe, 2011). Floods are usually exacerbated by human activities such as construction of houses in areas that are prone to flooding and deforestation (Byrant, 1991).

III. METHODOLOGY

Study area: Akungba-Akoko is located North-East of Ondo State and South-West of Nigeria. The region lies within Latitude 7028'N and longitude 5044'E. The study are covers an areal extent of about 2465.6km2. The area is situated at an altitude between 270m and 2750m above sea level. Most parts of the area have undulating terrain, which in many cases are almost completely encircled by high rugged rock outcrops, rising to a height of over 2750m in some places.

Geologically, the area is a physiograhic region characterized by two major

crystalline basement rocks of the main African Precambrian shield. These are magmatite and granite gnesis, with quartz and pegmatite veins. These rocks belong to the migmatitegnesis sub-classification of the basement complex of Nigeria. Akungba-Akoko is located within the humid tropical climate of the forest region, which experiences two climatic seasons namely the rainy season (April-October) and the dry season (November-March).

Data Collection: The sources of data employed for this research includes both secondary and primary data sources. The primary source of data were collected through the use of 350 questionnaire. The sampling technique adopted for this study is random sampling technique. The secondary data include information obtained from publications such as textbooks, journals, official documents, previous research works as well as newspapers on the various occurrences of flood disasters and pertinent issues relating to the subject.

The data collected for this study were analyzed using the simple percentage statistical method and presented using pie chart.

IV. RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

Table 1 shows that 51%of the respondents were male, while 49% of them were female. The majority (61.7%) of the respondents were between the age ranges of 21- 35 years. The majority (54.8%) of the respondents were married. The study shows that 51.7%, 39.1% and 6.6% of the respondents attained tertiary, secondary and primary education respectively while 2.6% have no formal education. It shows that most of the respondents had a high educational level.

On the primary source of livelihood, 29.1% of the respondents are civil servant while 22.3% of the respondents are traders. 19.1% of the respondents

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are students while 12.9% engaged in farming activities. 8.3% engaged in non-farming activities such as artisan and craftsman. It shows occupation diversity among the respondents.

Table 1: Socio-economic characteristics of the respondents

Variables	Frequency	Percentage
Sex		
Male	178	51
Female	172	49
Age		
Less than 20	20	5.7
21 – 35	216	61.7
36 – 50	67	19.1
51 – 65	29	8.3
Above 65	18	5.1
Marital Status		
Single	152	43.4
Married	192	54.8
Widow	3	0.9
Divorced	3	0.9
Educational Level		
Informal Education	9	2.6
Primary Education	23	6.6
Secondary Education	137	39.1
Tertiary Education	181	51.7
Occupation		
Civil Servant	102	29.1
Farmer	45	12.9
Artisan and Craftsman	29	8.3
Trader	78	22.3
Student	67	19.1
Others	29	8.3

Source: Field Survey, 2021

Frequency of Flooding Occurrence

Table 2 revealed the frequency of occurrence of flooding in the study area. Majority of the respondents (68.5%) experienced flooding often while 16.5% experienced it always. This implies that flooding is a significant challenged experienced often by the respondents. This aligns with the findings of Frederick et al. (2010) that the frequency and severity of floods in Northern Ghana over the last decade has increased considerably.

Table 2: Frequency of Flood Occurrence in the Study Area

frequency of occurrence of flood	Frequency	Percentage
Never	7	2
Rarely	19	5.4
Sometimes	26	7.4
Often	240	68.6
Always	58	16.6

Source: Field Survey, 2021

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Causes of Flood in Akungba-Akoko

Identification of the causes of flood is important in order to know the factors contributing to the loss of life, properties and resources which in turn influences the sustainability of life. Identification of the factors will help residents to take appropriate measures to halt them. The major causes of flooding in Nigeria urban areas include high intensity of rainfall, blockage of natural and artificial water ways, building on floodplains, improper planning and poor land use, poor drainage system and dumping of wastes into drainage. (Ologe, 2002; Oriola, 2000; Ali, 2005: Ologunorisa and Tersoo, 2006).

Considering the various factors that may have contributed to flooding as shown in Table 3. The cause of flooding with the highest percentage of 19.4% is high intensity of rainfall as one of the causes of flooding while 18.9% indicated that dumping of waste materials and refuse into drainage is another cause of flooding. Poor waste management is one of the anthropogenic factors contributing to and worsening the already difficult flooding problem in Nigeria (Ojo and Adejugbagbe, 2017). The poor attitude of Nigerians to waste disposal has been widely discussed in various studies (Eneji et al., 2016; Ojo and Adejugbagbe, 2017; Olukanni, Adebayo and Terebe, 2014). Further analysis of causes of flood reveals that 17.7% perceived that blockage of natural and artificial waterways also causes flooding. Drainage blockages linked to poor sanitation practices are common in Nigeria. Roadside dumping, canal dumping and dumping in rains are commonly practiced among a large proportion of the population. This blockage results in flooding during the rainy season (Onwuemele, 2012) (Plate 1 and Plate 2). 16.6% of respondents considered proximity of houses to riverbanks as a cause of flooding in the area. The degree of built up area limits infiltration and increase runoff. This is consistent with findings from studies carried out by Anderson (1970), Akintola (1978) and Oriola (2000) in Virginia, Ibadan, Ilorin and Ondo towns respectively.

Poor drainage system is believed by 15.1% of the respondents to be another factor substantially aiding flooding in the study area. This is a major human-induced exacerbator of the flooding experienced in Nigeria (Ogundele and Jegede, 2011). Most residential areas in Nigeria have no drainage system and rely on natural drainage channels and it is common for buildings and other infrastructure to be constructed in a manner that actually obstructs these drainage channels which results in flooding during the rainy season (Nabegu, 2014) while 12.3% believed that improper planning and poor land use facilitated events of flooding in the area.

Table 3: Causes of Flood in the Study Area

Causes of Flood	Frequency	Percentage
High Intensity of Rainfall	68	19.4
Blockage of Waterways	62	17.7
Proximity of houses to riverbanks	58	16.6
Improper Planning and Landuse	43	12.3
Poor Drainage System	53	15.1
Indiscriminate Waste Disposal	66	18.9

Source: Field Survey, 2021

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Plate1

Plate 2

Impact of Flooding on Residents

Flooding is the most widespread of all the natural hazards to which humans are exposed and it accounts for most damages to agriculture, household's livelihood systems, infrastructure, human settlements and public utilities. Table 4 shows the impact of flooding on residents of Akungba-Akoko. The victims of flood in the area have always had to live with the consequences of the flood disaster. According to the result of the analysis, it has been realized that a larger percentage of the respondents (20%) reported that flood incidence in the past has been responsible for the destruction of infrastructure. Floods have damage public road surfaces through the creation of potholes that make transportation and ease of movement difficult (Plate 3, Plate 4 and Plate 5). 18.5% of the respondents reported that flooding disrupt their day-to-day activities while 16.6% of the respondents classifies their loss to be the loss of crop, livestock and soil fertility which usually leads to reduction in income. This usually have a negative impact on the livelihood of the people. 16.3% of the respondents have lost their properties to flooding. This can often

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bring serious hardship to residents in the aftermath of the flood due to inadequate or more often lack of insurance cover while 11.7% have been displaced and forced to move out of their houses. According to Nwigwe and Emberga (2014) and Etuonovbe (2011) affirmed that flooding do not only damage properties and endanger the lives of human and animals but also affect the health of the people like outbreak of diseases such as cholera and malaria. 10% of the respondents reported that flooding leads to outbreak of diseases. The health of the people is usually affected by flood due to contamination of portable water from overflowing waste pits and the subsequent effects of such contaminants. 6.9% of the respondents classifies their loss to be the loss of relatives and loved ones.

Table 4: Impacts of Flooding in the Study Area

Impact of Flooding	Frequency	Percentage
Destruction of Infrastructure	70	20
Loss of Properties	57	16.3
Loss of Life	24	6.9
Displacement of People	41	11.7
Disruption of day-to-day activities	65	18.5
Loss of crop, livestock and soil fertility	58	16.6
Outbreak of Diseases	35	10

Source: Field Survey, 2021

Plate 3

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Plate 4

Plate 5

Management Strategies of Flood Control

The consequences of flooding are detrimental and the basic consequences of flooding include loss of human lives, submerging of residences and streets, inflow to sewage, municipal pollution, damage to properties, health hazards, cleanup cost, disruption of services, traffic obstruction, aesthetic discolouring, economic loss and infrastructural damage. Thus, taking all measures to combat floods are more than necessary in any society. These measures will help control periodic inundation in the areas that are liable to flooding in the following ways:

1. A well planned drainage system which can accommodate the localized heavy rains in the area should be put in place by both the state and local governments.
2. Repair and construction of these drainages where necessary should be embarked on to further ease the flow of storm water. Also, excavation of solid waste and other deposits which are present in the existing canal at Iju, within the local government.

3. Environmental sanitation program must be made compulsory and appropriate agency should be vested with the power to punish residents who fail to adhere to the rule of sanitation. There should be fines and penalties for people who fail to comply with the sanitation program.
4. Public enlightenment programmes should be organized to educate the public on the dangers of flood disaster and its causes as a result of the habit of throwing and dumping refuse in gutters, drainage paths and river channels. There is also need for government to set up various information programmes to educate the masses on how to respond to flood disaster.
5. The road network in the study area lacks drainage system to the extent that water overflow on the road during heavy rainfall. Thus, the state government along with the local government should embark on the construction of wide and deep drainage system that can withstand heavy water flow.

V. CONCLUSION

Water will always find it own path if not channelized by man. The need to research into the causes of flood and provide adequate flood management strategies is an aspect of environmental management that planners must pay ample attention to if they want to make the environment a haven. There is an urgent need for a collaborative effort of both government and stakeholders to support town planning, engineering and other professional agencies to combat flooding in Akungba-Akoko to avoid long –range consequences. The improvement of roads and accessibility of cities, provision of funds and equipments for disaster management agencies is critical to abating disasters in the Nigerian urban environment and even in the rural areas too.

Although, studies conducted in different areas, have shown that, a hundred percent (100%) success may not always be achieved in eradication of flooding problems especially in urban environment yet, their damaging effects can be mitigated through management measures that are carefully designed by government or affected communities. These must be effectively and economically supervised and funded.

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