

Examining the Factors Responsible for Flooding in Aba North L.G.A, Abia State Nigeria

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Abstract:

The work examined the cogent factors responsible for flooding in Aba North Local Government Area of Aba urban. One hundred respondents were selected for questionnaire distribution. Results obtained showed that, major factors responsible for flooding in the area include; government ineffectiveness and neglect, 13.59%, heavy and intense rainfall, 13.82%, non-functioning drainage systems, 11.62% and indiscriminate dumping of wastes, 11.62%. Recommendations made among other issues include; the evacuation and rehabilitation of existing blocked drainage channels.

Keywords: *Factors, Flooding, Periods of flooding*

Introduction:

Flooding is the most common disaster in Nigeria. The majority of Nigeria's States are increasingly suffering from annual flooding during the rainy seasons caused by increased precipitation linked to climate change (Aja and Olaore 2014). Unlike some natural disasters, rainfall flooding can be controlled with proper planning and the provision of necessary infrastructure (Agbonkhese et al. 2014; Satterthwaite 2017). Across the globe, flood events have posed tremendous danger to people's lives and properties. Floods cause about one third of all death, one third of all injuries and one third of all damage from natural disaster (IFRC, 2008). Several manifestations and effects of climate change and variation have been studied (NEST, 1991; Njoku, 2006). For instance NEST (1991) indicated that current and future vulnerability include human settlements and health, water resources, wetlands, agriculture, food security, coastal zones and land degradation. Land degradation reduces the quality and productivity of land. One of the causes of land degradation which has been on the increase as a result of climate change is erosion and flood. Urban flooding is a global phenomenon which causes devastating and economic losses and will continue to do so. Nwanorue, 2023 and Aderoju (2014), stated that flooding in 2010, affected 178 million people. Urban flooding is often regarded as devastating than rural floods and typically causes massive damage and disruption beyond the scope of the actual flood waters. A report by the World Bank (2011), pointed out that developing countries are presently characterized by rising flooding events, one of the effects of increasing urbanization which ultimately alters the fluvial process of the area, because urbanization increases surface run-off due to increase in relative proportion of impervious surfaces. In urban areas in Nigeria, flooding has been known to be caused by a combination of excessive precipitation and inadequate flow channel capacity of sewer system, (Soba, 2008), flooding may result when there is excessive rainfall or when natural or artificial channel is too small, relative to the discharge or when the land level is too low and less permeable to the water that gathers on the top of the ground surface. Floods are linked to increases in communicable disease, but studies indicates that certain endemic disease,

especially 154 gastrointestinal diseases rise to epidemic proportions, where sanitation standards are low (Orji, 2010) other health impacts of flooding are prevalence of communicable diseases, shortage of food supply, dispersion of household waste into the fluvial system and contamination of community water supplies and wildlife habitats, with extreme toxic substances (Njoku, 2010).

Flood is generally caused by many conditions working singly and in synergy. These conditions are mainly natural and anthropogenic in nature. Natural causes of flooding are enhanced mostly by nature of weather, landscape, and geology while anthropogenic causes of flooding are enhanced by human activities (Akin 2009,) observed that flooding is responsible for one third damages caused by natural disasters. Hoyt, (2009), worked on the flood hazard and dynamics of the urban residential land market. He opined that flood are natural events that man does create through his actions in deforestation and urbanization especially in flood prone areas. Thus, in real sense, most flood problems are caused by people. If man had left flood prone areas, there would have been little flood damages and problems.

This is unsurprising considering that climate change has arguably influenced regional precipitation patterns in recent history (Odjugo 2006), concluded that there are now more high-intensity short- duration rainfall events than there were three decades ago. Other factors have also been investigated with reference to the causes of these floods in Aba and Lagos. These include the topography of the area, land use (LU) and land cover (LC) modifications, and influence of beaches (Aderogba, 2012 Odunuga, 2008). Other factors considered are urbanization and population growth, poor urban planning, and poor environmental management and the indiscriminate disposal of solid waste (Lamond, 2012; Adeloje & Rustum, 2011), It is also suggested that tidal and co-tidal influences and frequent incursion from the Atlantic ocean into the low-lands bring heavy storms which also play important roles (Ojinnaka, 2013). These factors seem to influence the occurrence of the hazard and the exposure of elements at risk. However, in relation to the vulnerabilities of social systems to flooding in the area, the development of slum settlements and poor perception of flooding along local communities, urban residents and the general public are critical factors (Nkwunonwo, 2013, BNRCC, 2008,).

Wight (2011) stated that we appear to be making the problem worse by creating artificial conditions that produce excessive runoff which is the most common cause of flood. Man's activities in replacing natural soils and rocks which absorb water like sponge, with structures of concrete and asphalt which cannot absorb or infiltrate water into the ground water has largely been responsible for urban flooding. General causes of flooding include;

Sources of Flooding

Flood water can originate from a number of different sources. It is important to identify which of these sources of flooding your property or workplace may be at risk from. Information on each of these sources can be found below.

In general, flood risk in Derby can be categorized into the following sources, although in many cases property may be at risk from a number of different sources:

- **Fluvial (Main River) flooding:** It is the flood risk management responsibility of the Environment Agency.
- **Fluvial (ordinary watercourse) flooding:** This is the flood risk management responsibility of Derby City Council as the Lead Local Flood Authority; however the responsibility to maintain ordinary watercourses is that the riparian owner of the watercourse.
- **Surface water flooding:** This is the flood risk management responsibility of Derby City Council as the Lead Local Flood Authority.

Area of Study:

Aba urban is located in the southern part of Abia state in South eastern Nigeria. Aba urban is bounded by the rural communities of Osisioma on the west and North, by Obingwa rural communities in the East and Ugwunagbo rural communities in the South.

Aba is highly populated, with an average population density of 3000 inhabitants. The people are predominantly traders. Aba is a city and in the South East of Nigeria and the main trading centre in Abia State. Average annual rainfall recorded in the area is between 2000mm – 2300mm, while monthly average is about 1800mm. The intense rainfall is induced by excessive evapor transpiration due to increased paved surfaces and prevalent high temperature.

Methodology:

The survey research design was adopted for this research, questionnaire distribution were extend to all the selected respondents in Aba North Local Government Area. A total of 120 sample populations were chosen, out of which 100 respondents were selected purposively. Analysis of the copies of questionnaire distributed was based on the retrieved copies, hence, defining our conclusions in the work.

Questionnaire Distribution:

This study used questionnaire in the collection of primary data from the field. The questionnaire was designed in a simple format to enable the respondents to understand and respond to them easily. Questions related to the theme of the study, such as incidences of flooding, types of flooding and area affected by flooding, causes of flooding, presence of drainage channels and their level of adequacy, socio-economic implications of flooding, level of damage to buildings, loss of lives, destruction of amenities and disruption of traffic flow, days of flooding and duration of traffic flow, days of flooding and duration and non- flood days, government and community efforts at combating flooding were asked. Questionnaires were divided into three sections to effectively tackle the objectives of this study.

Validity of Research Instrument:

The primary data were obtained through questionnaire distribution, field observation and oral interview of respondents. The questionnaire instrument was validated by senior academics in the department. The research further subjected the data obtained during the research study to analysis, using a number of statistical analysis and data presentation methods such as tables, summations and simple percentages.

Result and Discussions:

Table 1: Response to the Existence of Flooding in Aba North L.G.A

Location	Yes	No	Total
Eziama	82	2	84
Brass St.	51	4	55
Nicholas Rd	45	3	48
Faulks Rd	97	1	98
Eziukwu Rd	74	4	78
Immaculate Rd	58	4	62
Margrate Ave.	28	3	31
Total	435	21	456
Percentage	95.39	4.61	100

The result presented in Table 1 is overwhelming in support of the occurrence of flooding in the area (95.39%). This result is expected because most of the drainage channels expected to evacuate the flood water is either blocked with wastes or destroyed, leaving the flood water to empty into the streets and even adjacent residential buildings.

Table 2: Response on the years of Residence in Aba North L.G.A

Location	0-5 years	5-10 years	10-15 years	15-20 years	Total
Eziama	48	23	10	3	84
Brass St.	28	16	8	3	55
Nicholas Rd	25	14	7	2	48
Faulks Rd	45	37	10	6	98
Eziukwu Rd	40	22	11	5	78
Immaculate Rd	20	18	16	8	62
Margrate Ave.	10	8	8	5	31
Total	216	138	70	32	456
Percentage	47.37	30.26	15.35	7.02	100

Source: Nwanoure, 2023

From Table 2, 47.7% of the respondents had lived in the area within the range of 0-5 years. Others include: 5-10 years, 30.26%; 10-15 years, 15.35% and 15-20 years, 7.02%. The essence of this investigation is to justify the data that emerge from the respondents. More importantly, we are relying on the assessment of the respondents to base our argument on the effect of flooding on commercial activities in Aba Urban.

Table 3: The Season and Periods of Flooding in Aba North L.G.A

Location	March to May	May to July	July to September	September to Early Nov.	Total
Eziama	10	20	30	24	84
Brass St.	6	17	20	12	55
Nicholas Rd	5	14	19	10	48
Faulks Rd	4	26	38	30	98
Eziukwu Rd	29	21	22	15	78
Immaculate Rd	13	14	25	8	62
Margrate Ave.	5	8	19	8	31
Total	63	122	164	107	456
Percentage	13.83	26.75	35.96	23.46	100

Nwanorue, 2023

Against the prevailing knowledge about flood occurrence in the year, which of course is due to rainfall activity generally. Flooding occurs during the months of September and October. However, Aba urban flooding largely influential by both natural and human factors. Nevertheless. We considered it worthwhile to rely on the assessment of residents who are residing in the area to ascertain the periods in the year flooding occurs. The result received is presented in Table 3, and it shows that in Aba North segment of Aba Urban, 35.96% of the respondents observed that flooding takes place in the area in the months of July to September; September to Early November, 23.46%, May to July, 26.75% and March to May, 13.83%.

Factors Responsible for Flooding in the Area

Table 4: Factors Responsible for Flooding in Aba North Local Government Area

Factors	Eziamaka	Brass St.	Nicholas Rd	Faulks Rd	Eziukwu Rd	Immaculate Rd	Margrate Ave.	Total	Percentage
Non functioning drainage systems	8	7	4	16	8	7	3	53	11.62
No drainage system provided	6	3	3	4	7	5	3	31	6.79
Indiscriminate dumping of solid wastes	10	8	6	10	10	6	3	53	11.62
Heavy rains	9	10	7	12	11	10	4	63	13.82
Blocking of the drainage channels	5	4	5	10	5	6	2	37	8.11
Low lying nature of land in Aba	4	3	2	3	5	4	3	24	5.28
Indiscriminate construction of houses, shops and warehouses	12	5	4	7	10	7	3	48	10.53
Inefficient and ineffective town planning officers	8	3	2	5	6	4	2	30	6.58
Poor quality roads constructed in the area	10	5	5	16	8	7	4	55	12.06
Government ineffectiveness and neglect	12	7	10	15	8	6	4	62	13.59
Total	84	55	48	98	78	62	31	456	100

Source: Nwanorue, 2023

As should be expected as presented in table 4 of heavy rains are experienced in the area and it was considered to be a major reason why there is flooding in Aba Urban, followed by the government ineffective and attitude of neglect towards the Aba Urban physical development needs, Both factors recorded 13.82%, others include indiscriminate dumping of solid wastes, 11.62%, lack of drainage systems in some places, especially along some of the street and local roads. In addition, the blockage existing drainage channels which disrupts the free flow of flood water in the channels was also identified.

Other issues considered by the respondents were; the low-lying nature of the land, 5.28%; indiscriminate construction of shops, houses and warehouses on spaces that may serve as buffer zones, vegetation belts or open spaces. Poor quality of roads constructed in the area was also considered as a major factor responsible for the persistent occurrence of flooding in the area, 12.06%. An example of the situation was the recent rehabilitation of Faulks road; it became submerged with flood water after few months of intense rainfall.

Table 5: Response on suggestions to flood control in Aba Urban

Suggestion	Aba North L.G.A	Aba South L.G.A	Osisioma L.G.A	Total	Percentage
Evacuation and Rehabilitation of Blocked Drainage Channels	42	204	93	339	10.56
Construction of new drainage channels	42	176	102	320	10.25
Resurfacing and Rehabilitation Of Existing Roads Network	40	175	88	303	9.71
Quick disposal of solid wastes dumped at collection points	40	140	70	250	8.01
Flood water Diversion and storage	35	120	72	227	7.27
Permanent / relocation from abandoned areas	40	120	68	228	7.31
Property Buyoules	28	140	73	241	7.72
Compensation affected persons	41	148	68	257	8.23
Declaring state Emergency on Aba Urban flood problem	32	145	58	235	7.53
Relocation of Ngwa Rd Market	43	160	56	259	8.29
Completion of Port-Harcourt Rd and evaluation of sample like direction	35	136	43	219	7.02
Total	456	1785	880	3121	100

Source: Nwanorue, 2023

In Table 5; suggestions made by the respondents on how to eradicate or minimize the effect of flooding on commercial activities in Aba Urban were presented. Some of the suggestions are either based on mitigation or adaptation methods.

More than 95% of the respondents confirmed that flooding exists in Aba North Local Area, which is a section of the Aba Urban, some of the respondents observed that flooding has been occurring in the area in the last 20 years. Specifically, 15.35% of this respondents noted that it had existed for the past 15 years. Against the backdrop is the fact that the season and periods of flooding in Aba North Local government area is within months July to September, Infact 35.96% of the respondents confirmed this assertion. Considerably, the factors identified as responsible for flooding in the area to include; non- functioning drainage systems, in some cases on drainage systems were provided. Others identified are: indiscriminate dumping of solid wastes, heavy rains and low lying nature of the land also made, which in summary were suggestions were either mitigation or adaptation measures. In a nutshell, these options are valid and work effectively if they are critically implemented.

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