

Effect of Flooding on Property Value: A Case Study of Isheri North, Isheri, Lagos State

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Abstract:- This paper assesses the effect of flooding on property value in Isheri North of Lagos mega city, Nigeria. The sample frame for this study comprises of 251 properties located in the study area out of which 20% was sampled represent 50 respondents in order of 1 house of every 5 houses; and 20 Estate Surveying and Valuation Firms on Isheri, Ojodu, Omole, Ikeja environ. Random sampling technique was adopted in the selection of the sampled properties. Data collection was done with the administration of instrument (questionnaire) on the selected respondents. The result of the findings shows that 96% of the respondents have witnessed flood which is caused by heavy rainfall, damp spills, poor drainage system, inappropriate refuse disposal was suggested to the respondents. The study reveals that properties in non-flooded areas of Isheri community attract higher rental values than similar properties in the flooded area of Isheri North. The study recommends needs for public enlightenment on the dangers of flooding and restriction of flood-prone areas as not non-buildable zone for the security of life and property.

Keywords: Flooding, Property Value, Isheri North, Isheri, Lagos State

I. INTRODUCTION

Flooding has been identified as the most common natural disaster (Hajat et al, 2006) and one of the major disasters affecting the growing population of the world. Flooding can be defined as an overflow that comes from a river or other body of water and causes or threatens damage. It is a situation that results when land that is usually dry is covered with water from overflowing river or heavy rain, flooding occurs naturally on the flood plains which are prone to flood disaster (Omisore, 2011). In the Czech Republic, in July 1997, floods killed 46, injured 2,500 people and about 50,000 people were evacuated from their homes.

The Niger River floods that occurred in August 2010 killed 30,000 animals, destroyed 500 homes and 20,000 people faced homelessness due to heavy rainfall in West and Central Africa (UN, 2010). Also, in October 2010, 15 days of floods and torrential rain in the Benin Republic killed 43 people, left 97,815 and 55,000 home destroyed (UN, 2010). Flooding has wreaked havoc across many parts of Nigeria in recent years including the states of Sokoto in the northwest, Borno in the northeast, Plateau in the centre and Yobe in the northeast. The 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 villages in Niger State (Osowe, 2010).

Over the years in Lagos, the flood has remained a worrisome natural problem which successive governments in the State could not effectively solve. Many parts of Lagos State have been subject to regular flooding, due to either heavy rains, dam breakage and blockage of the channels and when soil and vegetation cannot absorb all the water, the excess water then runs off the land in quantities that cannot be carried in streams, channels or retained in natural ponds and constructed reservoirs such as dams.

Flood, therefore, is still a problem in areas like Mushin, Jakande, Ajegunle, Alagbado, Festac, Ijora Olopa, Apapa, Iganmu, Ikorodu Road, Adeniran Ogunsanya Street, Maryland, Ebute-Metta, Lawson Street, Victoria Island, Ajah, Lekki and of course Isheri North, Kosofe. In October 2019, flooding of Ogun River (“Odo-Ogun”) in the Isheri North, Kosofe Local Government area of Lagos State and some parts of Ogun State created a lot of concern. The unprecedented release of excess water from Oyan dam by Ogun-Osun River Basin Development Authority in September 2019, provided the platform for the unusual flooding in the area. In the past, various studies had identified location, neighbourhood characters, property characters and environmental characters as factors affecting property values with little or no emphasis on flooding as one of the major factor.

II. LITERATURE REVIEW

In advanced countries, most of the literature on flooding has focused on topics such as the impact of flooding in relation to various hurricanes, its effects on megalopolitan land prices, coastal inundation, sea-level rise and its impact on properties values. For the purpose of this paper, a simplified grouping of flood types is practical while recognising that many flood events may combine more than one type.

The Environment Agency (EA) definitions of the flood events of 2000 cited in National Audit Office (2001) categorises flood as coastal and estuarine flooding, fluvial flooding and overland flooding (also known as pluvial flooding). Omisore (2011) identifies six types of flooding: coastal flooding, river flooding, urban flooding, dam burst levee failures, dam spills

and flash flooding.

2.1 Causes of Flooding

There is a strong social as well as natural science component to natural disasters and while the events themselves cannot be prevented, their disastrous consequences can often be reduced by appropriate advance planning and the preparation of emergency measures on the part of the community at risk (National Audit Office, 2001). Floods have been occurring throughout earth history, and are expected so long as the water cycle continues to run. Streams receive most of their water input from precipitation, and the amount of precipitation falling in any given drainage basin varies from day to day, year to year, and century to century (Khalequzzaman, 1994).

The author went ahead to identify the causes of flooding as; sea-level rise, subsidence and compaction of sediments, riverbed aggradation, soil erosion due to tilling, excessive development, damming of rivers, seismic (earthquake) and neotectonic activities and greenhouse effects. Ojo (2011) identifies causes of flood in developing nations as unregulated developments, invasion of public areas, lack of institutional capacity at the municipal level, unrealistic regulations, economic pressures from developers, ineffectiveness of planning regulation by allowing development on flood plains and poor and lack of standard drainage system on roads.

In his own paper, Omisore (2011) grouped the causes as natural causes (heavy torrential rains or storm, ocean storms and tidal waves, usually along the coast and blockade of river or drainage courses by waste) and human causes (lack of meteorological data for weather forecasting, burst of main pipes, dam burst/levee failures, dam spills, property development along river setbacks and indiscriminate waste disposal). Atere (2000) examines the causes of floods in Ikoyi and Victoria Island, Lagos and identifies causes of flood in these areas as excessive rainfall, faulty drainage designs, blocked drainage channels by refuse and sediments, obstruction by buildings and inadequate drainage heads to make the drainages efficiently drain off storm water. From the above, causes of flooding in Nigeria could be as a result of natural cause or human cause.

2.1.1 Natural Cause

- a. Inform of heavy or torrential rains/rainstorm.
- b. Oceans storms and tidal waves usually along the coast.

2.1.2 Human Causes

- a. Burst water main pipes
- b. Dam burst leave failure
- c. Dam spills

2.3 Factors Affecting Property Values

Real property has no value if it has no utility, not scarce and not effectively demanded. Real property has significance only as it satisfies man's needs and desires. It is this man's

collective desire for real property that gives rise to value (Olusegun, 2003). Thus, the ability of a property to satisfy man's needs and desires together with its degree of scarcity and utility compared with others makes man to ascribe value to it. Property value, therefore, according to Millington (1981) is the money obtainable from a person(s) willing and able to purchase property when it is offered for sale by a willing seller, allowing for reasonable time for negotiation and with the full knowledge of the nature and uses which the property is capable of being put. Real property is heterogeneous goods that is comprised of a bundle of unique characteristics reflecting not only its location but equally affected by other amenities such as the quality of neighbourhood and infrastructure.

Basically, major factors affecting the value of property include; age, location, size, neighbourhood characteristics, economic activity, population, transport etc. (Joslin, 2005; Kauko, 2003; Oyebanji, 2003 and Olusegun, 2003).

On a country basis, the studies carried out in the UK showed that location, level of income, interest rates and population are the major factors affecting property values. While in the United States of America, the studies conducted showed that the main factors influencing property values are: number of employment, age composition of the population and rate of household formation. On the other hand, the studies in New Zealand revealed that property values are mostly influenced by the level of income, construction activities, economic activities, lot size, age of the house and other property characteristics. The Nigeria situation is not too different from that of the UK because according to Olusegun (2003) and Oyebanji (2003), the major factors influencing property values, among others, are location, plot size, income, interest rate and population.

Their various findings agreed that location is a major determinant of property value. Location is important in relation to proximity to the target market and sources of supplies; conditions and facilities are important in relation to attracting optimal rentals, and security is important in relation to tenant and visitor safety. However, these studies ignore the effects of other factors (variables) in the determination of property values. McCluskey et al (2000) measure the effect of location on residential house prices using the Ordnance Survey of Northern Ireland data and conclude that location and structural characteristics are the key determinants of residential property values.

Olusegun (2003) also identifies these factors under three major groups as external factors, internal factors and economic factors. The external factors include location and accessibility, internal factors include the individual features of the property such as number of bedrooms, plot size, garage, number of a toilet, and so on, economic factors include individual's purchasing power, the level of interest and inflation rates in the country.

2.4 Effects of Flooding on Property Values

Various scholars have researched the impact of flooding on property values in different nations. In the United States of America, existing studies have examined the impacts of both flood risk and a particular flood event on house prices. A consensus reached stated that flood risk lowers house prices after controlling for property attributes, location and neighbourhood characteristics, although the magnitudes of price discounts vary (MacDonald, Murdoch and White 1987; Holway and Burby, 1990; Bartosova et al., 1999; Harrison, Smersh and Schwartz, 2001; Hallstrom and Smith, 2005; Bin and Polasky, 2004). Tobin and Montz (1988) compared means/medians of property values before and after the 1985 flood event in Yuba County, California, using sample t-tests. They found that immediately after the flood event there was no property market in the flooded area and houses were sold in the next few months but at a lower price; as memories of the flood receded, the housing market picked up to better than pre-flood levels. These findings are based on small sample size (62 properties) and no allowance was made for the differing characteristics between houses.

In the Thames however, no price decrease existed. Another study in Pennsylvania, California and Illinois finds that selling prices fell following flood events but recovered to levels at or above pre-flood values; and the recovery period was shorter for places experiencing less severe flooding (Tobin and Montz, 1994). Three possible explanations exist to interpret the inconsistent results of the house price effects of a flood event. First, different socio-economic contexts and flood experiences may result in differences in people's perception of flood hazard and therefore market behaviour of house prices (Montz, 1992; Tobin and Montz, 1994). If flooding occurs only rarely in an area and there is a long time gap between two flood events, it is likely that house price falls immediately after a flood event and then recovers, as people tend to forget flood risks. If flooding occurs frequently, house prices may remain low as the market does not have enough time to recover between flood events. In this case, flood risks have been completely capitalised into house price and the future flood has no impact on property values. A second explanation for the mixed findings in the literature is that sample sizes in some studies are too small to reach robust conclusions, e.g. 62 properties in Tobin and Montz (1988). A third explanation concerns the different methods used by researchers in various studies. For example, some studies controlled for property attributes while others did not. Bin and Polasky (2004) use the 1999 Hurricane Floyd as a natural experiment to analyse property prices of 8,375 homes between 1992 and 2002. The authors reported that houses located within the floodplain were worth on average 5.7% less than a comparable property located outside of the floodplain. This price discount doubled after Hurricane Floyd.

In the United Kingdom, Eves and Brown (2002) wrote on the impact of flooding on residential property values in England. The objectives of their research were to determine the

performance of flood-affected properties in comparison to similar nearby residential properties that are not flood liable, to establish if there is an increasing reluctance for insurance companies to insure residential property in flood liable areas, and to determine if flood liable residential property provides an additional security risk to financial institutions in the home lending market. Eves and Brown(2002) quoting the Environmental Agency (2001) stated that over 10% of the population of England and Wales is directly at risk from flooding, with a greater percentage of the population being indirectly affected by flooding due to road closures, service disruption and the loss of goods and produce. This was equated to 1.85 million residential properties in England being at risk of flooding, with an additional 185,000 commercial properties also being situated in flood-prone areas. Based on these residential and commercial property numbers, Environmental Agency (2001) stated that there were up to five million people in England and Wales who were directly at risk from flood event and that as at 2001 the value of residential and commercial properties subject to flooding was over £200 billion, with a further £14 billion of rural land subject to flooding. The study was based on the survey of chartered surveyors in all counties of England that had been identified as flood liable and subject to coastal tidal flooding. These counties were identified from the Environment Agency flood maps. The result of the survey showed that out of the 23 counties surveyed, 12 counties rarely experienced any residential property flooding, with a further 4 counties experiencing frequent flooding and seven counties being subject to regular flooding. Their findings also revealed that the decline in residential property values is linked to the availability of both residential property insurance and finance. In areas where insurance is difficult to obtain, the impact on residential values is more significant.

Eves and brown, (2002) concluded in their research that there is a direct significant correlation between the severity of a flood and a reduction in residential property values. A severe flood provides a very visual short-term impact on the property buyer, seller, chartered surveyor, insurer and financier. Previous research by Eves (1999) indicated that this perception of flooding reduces in relation to purchasers and sellers but is still a significant factor for the other parties involved in residential property.

In Australia, Eves (1999) researched on the long term impact of flood effect on residential property prices in Australia. The research was conducted to determine the performance of flood-affected properties in comparison to similar nearby residential properties that do not flood liable and to establish if the difference in values between flood liable residential properties and flood free residential properties is constant, or decreases as the time period from the last known flood increases. In his research, he quoted Lambley and Cordery (1991) stating that the property that is subject to over floor flooding can result in the overcapitalisation of the property due to the requirement to restore the property after flooding has occurred and that not rectifying the damage from flooding

may minimise the problem of overcapitalisation but would result in the loss of property value due to the neglected state of the building and overall structural depreciation. He also quoted Fibbens, (1992) stating that flood-prone properties are not considered as attractive as other residential properties and this results in a lower price or value and that on this basis the greatest impact on value or price would be immediately after a severe over floor flood where both disruption and property damage occurs. Eves, (1999) analysis, showed a definite price differential between similar types of properties that are flood-free compared to the same type of properties that flood liable.

III. METHODOLOGY

The data that will be required for this study are data on to gather data on socio-economic characteristics of children representatives (parent/guardian), availability and adequacy of physical facilities and key performance indicators in the study area. Information obtained from Lagos State Government, Land Use Charge Office, revealed that there are twenty-two streets and two hundred and fifty-one houses in the study area and the 267 firms of Estate Surveyors and Valuers in Lagos State (Nigerian Institution of Estate Surveyors and Valuers, NIESV, 2009) Seventh Edition of the Directory of Members and Registered Firms in Nigeria.

The sample frame comprises the 251 properties located in the study area out of which 20% was sampled represent 50 respondents in order of 1 house of every 5 houses; and 20 Estate Surveying and Valuation Firms on Isheri, Ojodu, Omole, Ikeja environ. Random sampling technique was adopted in the selection of the sampled properties as stated above. Data collection was done with the administration of instrument (questionnaire) on the selected respondents. The data obtained from the questionnaires administered were analyzed with Statistics Package for Social Sciences (SPSS). Both descriptive and inferential statistics were adopted. Descriptive statistics such as cross-tabulation were used in explaining respondents' socio-economic attributes, causes of flooding, comparable of rental value. Inferential was adequately used as well.

IV. RESULT AND FINDINGS/DISCUSSION

This section discourses findings based on the data collected from the field survey conducted in Isheri North, Kosofe Local Government Area of Lagos State. All tables in this section are from the field survey (2019), except otherwise stated.

4.1 Occupancy Status by Respondents

To ascertain the status of residents within the estate, respondents were asked to specify whether they were owner-occupier or tenant. Below are the responses from the respondents.

Table 4.1 Occupancy Status of Respondents

Occupancy Status	Frequency	Percentage (%)
Owner occupier	20	30
Tenant	30	60
Total	50	100

Table 4.1 above shows the occupancy status of residents in the study area. According to the analysis, properties in Isheri North are major tenants (60%) while the remaining 40% are owner-occupier. With 60% tenanted, it could be deduced that the frequency of flooding within the area must have prompted house owner to vacate and subsequently rented out their properties to avoid the menace of flooding within the area.

4.2 Period of Residency within the Neighbourhood by Respondents

To determine the length of period which the respondent residents have been residing within the estate, they were asked to indicate how long they have been in the estate as those who have not to witness the occurrence of flooding perhaps as a result of shortness of their moving to the estate may not be in the position of expressing the impact which the occurrence of menace of flooding on residents. The result obtained from the respondent residents is contained in the table below

Table 4.2 Residency Period of Residents/Respondents in the Estate

Period	Frequency	Percentage (%)
1 year and below	5	10
2 years to 5 years	11	22
6 to 10 years	13	26
Above 10 years	21	42
Total	50	100

It can be inferred from the above table 4.1 that higher percentage (45) of the respondent resident has lived the estate for over ten (10) years while those who have resided in the estate between the period of 6 to 10 years 26% represent the number of people who have lived. This suggests that majority of residents/respondents have lived in the estate for a substantial period which could be afforded to witness the occurrence of flooding as a result of which the information given by them can be considered reliable and useful.

4.3 Experiencing Flood by the Residency within the Neighbourhood

This is to confirm whether the respondent has ever experienced flooding since they have been residing in the estate. The result of their responses is presented below.

Table 4.3 Experience Flood by Respondents in the Neighbourhood

Experiencing Flood Occurrence	Frequency	Percentage (%)
Yes	48	96
No	2	4
Total	50	100

Table 4.3 above shows that 96% of the respondents have witnessed flood occurrence at one point or the other while only 4% have not had the experience. This implies that the majority of respondents had been victims of flooding in the time past and this suggests that the issue of flooding constitute serious menace in the neighbourhood.

Table 4.4 Type of Properties Occupied

Type of Properties	Frequency	Percentage (%)
Duplex	6	12
3 Bedroom flat	25	50
2Bedroom flat	20	40
Total	50	100

Table 4.4 above shows various types of properties in the study area. It is evident from the table that 90% of the respondents reside in 2/3bedroom flat while 12% reside in duplexes. In-depth interview conducted revealed that the commonest type of properties in the study area is a block of flat.

Table 4.5 Annual Rent of Respondents (Residents)

Annual Rent (NGN)	Frequency	Percentage (%)
400,000 – 600,000	4	13.3
601,000 – 800,000	10	33.3
801,000 – 1,000,000	8	26.7
1,001,000 – 1,200,000	4	13.3
1,201,000 – 1,400,000	2	6.7
1,401,000 – 1,600,000	2	6.7
Total	30	100

The annual rent paid by tenants is showing in the table above. The table revealed that 13.3% of the respondents paid annual rent between NGN400,000 and NGN600,000 while 60% of the respondents paid annual rent between NGN601,000 to NGN1,000,000. In-depth interviewed conducted reveals that similar properties located in flood-free zone area of Isheri command higher rents than the ones contained in table 4.5.

4.6 Causes of Flood in Isheri North

In order to ascertain major causes of flooding being experienced in the study area, the various causes identified in the literature including heavy rainfall, damp spills, poor drainage system, inappropriate refuse disposal were suggested to the respondents. The results were analysed thereafter to draw a conclusion.

Table 4.6 Causes of Flood in Isheri North

Causes of Flood	Isheri North Residents	Estate Surveyors and Values
Drainage Problems	6 (12%)	2 (10%)
Dam Spills (Oyan Dam)	30 (60%)	13 (65%)
Heavy Rainfall	12(24%)	4 (20%)
Poor refuse disposal	2 (4%)	1 (5%)
Total	50 (100%)	20 (100%)

It can be inferred from the above that; from the perspective of residents and Estate Surveyors and Valuers, 60% and 65% respectively were of the opinion that dam spills are the major cause of flooding in Isheri North; about 24% and 20% of residents and Estate Surveyors and Valuers were of the

opinion that heavy rainfall accounts for flooding in the study area. While drainage problem and poor refuse disposal are a relatively insignificant cause of flooding. The results obtained from the analysis of respondent's responses to the cause of flooding in Isheri North was not unexpected as Oyan dam spills have been a reoccurrence cause of flooding along the axis coupled with the marshy nature of the neighbourhood.

4.7 Comparison of Rental Values of Properties in Isheri North and Non-Flooded Areas of Isheri Neighbourhood

The basis for comparison is to establish the relationship between the values of properties in the flooded area and non-flooded area. The data obtained during the field survey were analyzed below.

Table 4.7 Comparison of Rental Values of Properties in Isheri North and Non-Flooded Areas of Isheri Neighbourhood

Type of Property	Isheri North (NGN)	Isheri Community (Non-Flooded Area)
Duplex	1,200,000	1,500,000
3bedroom flat	800,000	1,000,000
2bedroom flat	600,000	800,000

The analysis contained in table 4.7 reveals that properties in non-flooded areas of Isheri community attract higher rental values than similar properties in the flooded area of Isheri North.

4.8 Reasons for Residing in Isheri North despite Incessant Flooding

Irrespective of the incessant flooding of the study area, residents still reside in the neighbourhood. To ascertain the reason(s) for the above, they were asked to pick out of the reasons provided as detailed in the table below:

Table 4.8 Reasons for Residing in Isheri North despite Incessant Flooding

Reasons	Frequency	Percentage
Proximity/direct access to the place of work	26	52
Security enjoying in the estate	15	30
Affordable rent	9	18
Total	50	100

Table 4.8 shows that 52% of the respondent attributed reason for continuing stay to the easy accessibility to place of work while 30% reside in the area as a result of high level of security and 18% of respondent stated the reason for their continuous stay in the estate as a result of affordability of rent when compared to other locations of like benefits.

V. CONCLUSION AND RECOMMENDATION

Flooding is a perennial problem in Lagos Metropolis, in general, and Isheri North, in particular. The major causes of flooding in Isheri North are Oyan dam spills, heavy rainfall, drainage problem amongst others. A comparison of rental values from both flooded and non-flooded areas of Isheri

North and Isheri Community show disparity with rental values of properties in non-flooded areas higher than those of the flooded areas. The study recommends that there should be public enlightenment on the dangers of flooding. There should be various ways of disseminating information to citizens through broadcast media, print media, seminars, inter-personal communication and handbills on the dangers of flood and its causes as well as the risk of flood.

This will not get the general community in the flood zone area prepare and make alternative accommodation for the period the Oyan dam will be opened/spillover, it will also reduce the level of damage on household equipment and loss of life (where possible). The study also recommends the need by the authority of Lagos State Urban and Regional Planning ensuring the demolition of illegal structures built across the drainage channels within the study area in particular and the whole of the State in general to forestall the incessant occurrence of flooding in the estate and the whole of the State. In addition, the State Government should intensify the construction of proper drainage systems in the whole of the state while citizenry of the State is to be discouraged from the act of dumping their refuse indiscriminately in the drainage channels provided in the State.

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