

Challenges of Flooding on The Rental Values of Properties in Asaba Capital Territory, Delta State

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Abstract- Flooding is as old as man. It's devastating effects are beyond imagining. Holy book, the bible recorded in the book of Genesis chapter Seven that the old world was destroyed not too long after creation through the flooding and only 8 people were saved - Noah and his family and since then the world have not ceased to experience flood at one point and another. Flooding is an overflowing of water onto land that is normally dry. Floods can happen during heavy rains, when ocean waves come on shore, when snow melts too fast, or when dams or levees break. Flooding may happen with only a few inches of water, or it may submerge a house to the rooftop. Several Nigerian communities had in recent times experienced an upsurge of groundwater flooding with devastating effects. The demand for land for development had not been without attendant problems caused by the flood. This research identified the nature, causes and main factors that cause groundwater flood and their impacts generally and on real property value. Questionnaires were designed and administered on respondents from the research area. It was found from the frequency distribution table and percentage statistical charts analysis that property values are adversely affected by flood. And that flood activities hinder appreciable land development. This research recommends among other things the enforcement of building and other environmental laws aimed at reducing the incidence and effect of flood, the use of flood resistant building materials by developers and the use of modern digital GIS devices in flood forecasting.

Indexed Terms- Challenges, flooding, rental values, real properties, and Asaba.

I. INTRODUCTION

Flooding is an environmental hazard and has become more prevalent over the past decades in Nigeria. The recent incidence of flood disaster in the country has

been attributed to increased rainfall and infrastructure failure. Coastal farming communities and property developers are the most adversely affected as their properties, farms and fishing implements were inundated or washed away by the floodwater. An important aspect of flood disaster management is the provision of timely information, necessary for mitigation of the impact of the disaster. Damage caused by flood to agriculture, homes and public facilities around the world runs into several millions of dollars annually. In most cases, flooding occurs when rivers overflow their banks as a result of excessive rainfall, dam failure, or obstruction of river channel resulting from encroachment. Several flood disasters have occurred in Nigeria in the recent past. These include the Sokoto flood disaster of September, 2010; Ibadan flood of August 2011 and the September 2012 flood disaster which can be described as one of the most devastating in the last half century. The September 2012 flood affected several states in Nigeria including Adamawa, Kogi, Delta, Bayelsa and Rivers States, displacing millions of people in the process. This flood has rendered millions of people homeless and their means of livelihood destroyed. The social and economic challenge of the recent flood incident, particularly on rental value of properties, cannot be overemphasized, yet the long-term impacts of the recent flood in Nigeria could be more severe. As a result of the increasing intensity and frequency of flooding in the recent past, attempts have been made to investigate the natural and human causes of flood and flood related disasters.

The Wikipedia encyclopedia (2010) defined flooding as an overflow or accumulation of an expanse of water that submerges the land. Flooding is a peak discharge of water exceeding the channel capacity, which may have been naturally or artificially induced by man as a result of blockage of water course.

The National Erosion and Flood Control Action Plan Committee (2005) defined flooding as a condition when the discharge of a river cannot be accommodated within the margins of its normal channel so that waters spread over adjoining land. The above notwithstanding, anytime parcels of land that are normally dry become submerged with water, resulting in loss of lives, properties and other forms of devastations; it is termed flooding.

Several Nigerian communities had in recent times experienced flooding with devastating effects. Every particular parcel of real estate is usually different in that it occupies a geographically defined space on the earth's surface. The survey of challenges of flooding to the rental value of property is very significant. An old cliché states that the three determinant of property value is location, Location, location. Obviously, this is a redundant statement, but it does illustrate the importance of location in the real estate industry. Essentially, prototype properties can have vastly different prices if located in different areas. In practicality, however, many properties share the same major location attributes but market is the major value determinant. The change in population size, usually as a result of rural-urban immigration ineluctably causes gradual change in the mode of living and development.

II. AREA OF THE STUDY

Asaba has a certain kind of aura about it, because it is the western bank of River Niger opposite Onitsha and serve as a gateway to the eastern part of Nigeria.

Asaba is known for fishing and agriculture. They associated their origins and mythology with the Nteje and Igala people. Igala prince impregnated Nteje lady who gave birth to "NNEBISI" the ancestor of Ahaba kingdom and hegemony in pre-colonial times. The name is so revered that no other person has borne or will bear it. History had it that Asaba was the seat of government of southern protectorate and centre of trade. It was in Asaba that Richard and John Lander, the British explorers of the Niger, were taken captive by the Igbos in 1830 and later, it became a trading post for Sir George Goldie's National African Company. Asaba served as administrative headquarters of the territory governed by the Royal Niger Company. Asaba has been an entrepot for palm produce and other

agricultural exports carried by the Asaba - Onitsha ferry. Presently, Asaba is the terminus of the 4,604metre bridge to Onitsha (completed in 1965). Asaba have deposits of lignite.

There is a long stretch of road that cut across the length of Asaba beginning from Cable point and terminates at Inter Bau round about and it is named after their ancestor 'NNEBISI ROAD'. Other surrounding towns namely, Aboh, Ugbolu, Illah, Onitsha and Issele call themselves Aniocha/Oshimili and share the same tradition and culture. They also have Ezechima lineage.

Asaba town comprises two distinct sectors, namely the built up older portion that is overcrowded and unplanned with poor road network and the sparsely developed part with open land surrounding the houses. The open area is -their boundaries with neighboring villages of Okpanam, Ibusa, Anwai and has been primarily used for agriculture. The pattern of built—up and open sections is applicable to most communities in the Capital Territory. With each of these communities having this dual nature is noteworthy for planning purposes to maintain the peculiarities.

With the increasing number of these non-agricultural specialists, Asaba gradually developed into a pre-industrial urban centre both by natural increase and by immigration (there was of course some out-migration of some of the craftsmen, even if it was temporary migration). By 1850, the population of Asaba was estimated at 19,000. This compared very favorably with the population of some other pre-industrial urban centres in the area that came to be known as Nigeria; for about the same year the population of Benin was established at 15,000 by Adams, Katsina at 8,000 in 1855 by Barth, Lagos 20,000 in 1856 by Brown, Onitsha at 15,000 in 1850 by Burdo, and Ondo at 15,000 in 1883 by Chausse. Before the creation of Delta State in August 1991 with Asaba as its Capital, the town had played different roles as administrative/zonal headquarters to different Governments. In these roles the city had remained more rural than urban in scope and essence. This had to change as soon as it became a State Capital. The influx of population made up mainly of returnee civil servants from Benin, employees of federal ministries

and agencies, student population of Delta State University, Anwai campus and others, brought tremendous pressures on existing infrastructure and services.

Thus, post-civil war period witnessed an unprecedented number of the rural population trooping into the urban centers due to the conspicuous prosperity brought about in the urban area by civilization. The four towns of Asaba, Okwe, Ibusa and Okpanam have grown to merge with each other, forming a conurbation. The four towns constitute the urban core meant for more detailed proposal. This resulted to high demand for the existing limited supply of landed properties. Thus, Rent for landed properties increased considerably.

This trend has continued with the effect that "the average worker is paying 30% to 40% of his salary as rent" (oshadiya, 1985). Thus the effect of flooding on the property has led to the variations of rent on properties.

In urban areas, due to location advantage (for example Prime Location) which some properties offer above others for commercial and residential uses, rent tends to vary on account of the type of use to which a property can offer.

However, with population explosion over the years, building on natural water course and indiscriminate dumping of refuse, one problem that struck Asaba town which successive governments were unable to tackle is flood. The flooding problem in Asaba has remained an albatross for nearly two decades.

This study therefore has been prompted to identify main factors that cause flood and their effects thereof mainly on real property rental value in Asaba, Delta State.

III. AIM AND OBJECTIVE

The aim of this study is to critically analyze the challenge of flooding on rental values of property in Asaba, Delta State with a view to identifying the factor that caused and the effect on the rental values of properties. The following objectives are to be pursued;

1. To examine the variation of rent and capital value of properties affected by flood in Asaba.
2. To identify the best practice in flood disaster management that could be adopted in the subject study area in order to boost the value of real estate.
3. To appraise the perception of flood disaster by occupiers in flood plain and their strategies in relation to occupying such property at risk.
4. To examine the effect of unsuitable market value of properties within the neighborhoods affected.
5. To determine or examine whether the income prospects of tenants/occupiers affect their decision to rent/lease a property.

IV. METHODOLOGY

The population of study covers the number of properties in Asaba. These areas include Rondi Street within Anwai Road . axis, Obiorah Street within Infant Jesus Axis and Ike Street within Cable Point area of Asaba. The total population of properties in this area is estimated to be 115. (One hundred and Ten) respondents. (I.e., Estate Surveyors and Valuers -40, property occupiers- 75).

Sample size is a limited number of elements selected from a population which is a representation of the population. Hence, Sample size determination involves showing how the representative of that population was selected. It is a group of items taken from the population for examination. It is simply a smaller part of the population. Samples are useful because they allow the researcher to examine the characteristics of the population. The Yaro Yamani statistical formula was adopted for this Research work. This was adopted because the studied population is spread across a wide area. Here, areas to be assessed were randomly selected. All subjects are to be accessed and if not possible, a significant random sample is selected. A random sample was selected from the three areas which were randomly chosen; Rondi Street / Anwai Road, Obiora Street/ Infant Jesus Axis, and Ike Street / Cable point Asaba.

This formula is thus:

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

n= sam_e

e= level of significance or margin of error

1= unit (a constant)
N = 115

$$n = \frac{115}{1 + 0.2875}$$

E - 0.05

n = ?

(The choice of 0.05 level of significance is purely an exclusive decision of the researcher).

$$n = \frac{115}{1.2875}$$

n = 89 (sample size)

Replacing the values above with the above formulae, we have

While sample size is 89, the researcher distributed 89 questionnaires to the Respondents. Therefore, analysis of data was based on the response 89 respondents.

$$n = \frac{115}{1+115(0.05)^2}$$

V. DATA ANALYSIS

Table 4.1: Property market trend in Asaba from 2010 to 2019

Location	Type of property	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Affected Area	Amt p.a N'000	Amt p.a N'000	Amt p.a N'000	Amt p.a N'000	Amt p.a N'000	Amt p.a N'000	Amt p.a N'000	Amt p.a N'000	Amt p.a N'000	Amt p.a N'000	Amt p.a N'000
		0	0	0	0	0	0	0	0	0	0
Rondi St.	1 bedroom flat	120	120	120	120	120	120	120	130	130	130
Obiora St.	1 bedroom flat	120	120	120	120	120	120	120	130	130	130
Ike St.	1 bedroom flat	120	120	120	120	120	120	120	120	120	120
Rondi St.	2 bedrooms flat	150	150	150	150	150	180	180	180	180	180
Obiora St.	2 bedrooms flat	150	150	150	150	150	160	180	180	180	180
Ike St.	2 bedrooms flat	150	150	150	150	150	160	160	160	160	180
Rondi St.	3 bedrooms flat	180	180	180	180	180	180	180	200	200	200
Obiora St.	3 bedrooms flat	180	180	180	180	180	180	180	200	200	200

Ike St.	3 bedroom s flat	180	180	180	180	180	180	180	200	200	200
Rondi Sit.	Duplex	400	400	400	400	600	600	600	800	800	1,000
Obiora St.	Duplex	400	400	400	400	550	550	550	600	600	900
Ike St.	Duplex	400	400	400	400	600	600	600	600	600	900
Unaffected Area											
Okobi St.	1 bedroom flat	120	120	120	120	120	120	120	130	130	130
Okparaku St.	1 bedroom flat	130	130	130	150	150	150	150	180	180	180
Chukwum a St.	1 bedroom flat	130	130	130	150	150	150	150	180	180	180
Okobi St.	2 bedroom s flat	150	150	180	180	180	180	180	220	200	200
Okparaku St.	2 bedroom s flat	150	150	180	180	180	180	180	220	200	200
Chukwum a St.	2 bedroom s flat	150	150	180	180	180	180	180	220	200	200
Okobi St.	3 bedroom s flat	200	200	200	240	240	240	250	250	250	280
Okparaku St.	3 bedroom s flat	200	200	200	240	240	240	250	250	250	280
Chukwum a St.	3 bedroom s flat	200	200	200	240	240	240	250	250	250	280
Okobi St.	Duplex	700	700	700	1,000	1,000	1,000	1,000	1,200	1,200	1,200
Okparaku St.	Duplex	700	700	700	1,000	1,000	1,000	1,000	1,200	1,200	1,200
Chukwum a St.	Duplex	700	700	700	1,000	1,000	1,000	1,000	1,200	1,200	1,200

Table 1, shows the market rent trend of different accommodations within Asaba with regard to flood prone and flood free areas.

Before taking the lease were you informed about the flood?

Table 2, in question 8 will used to test hypothesis 1 (Ho)

Rental analysis of flood affected properties using the full rental value of each type of accommodation from 2010 to 2019.

Correlation technique is adopted to determine if flooding is the reason for the property values.

Table 4.2

Using Pearson product moment correlation formula

$$\frac{n \sum xy - \sum x \sum y}{\sqrt{n \sum x^2 - (\sum x)^2} \cdot \sqrt{n \sum y^2 - (\sum y)^2}}$$

Year	X no. of year	Y (N'000)	Rent XY(N'000)	X ² (N'000)	Y ² (N'000)
2010	1	120	120	1	14,400
2011	2	120	240	4	14,400
2012	3	120	360	9	14,400
2013	4	120	480	16	14,400
2014	5	120	600	25	14,400
2015	6	120	720	36	14,400
2016	7	120	840	49	16,900
2017	8	130	1,040	64	16,900
2018	9	130	1,170	81	16,900
2019	10	130	1,300	100	16,900
	$\Sigma X = 45$	$\Sigma Y = 1,230$	$\Sigma XY = 6,870$	$\Sigma X^2 = 385$	$\Sigma Y^2 = 151,500$

$$\frac{10(6,870) - (45)(1,230)}{\sqrt{10(385) - (45)^2} \cdot \sqrt{10(151,500) - (1,230)^2}}$$

$$\frac{68,700 - 55,350}{\sqrt{3,850 - 2,025} \cdot \sqrt{1,515,000 - 1,512,900}}$$

$$\frac{13,350}{(\sqrt{825})(\sqrt{2,100})}$$

$$\frac{13,250}{\sqrt{3,832,500}}$$

$$\frac{13,350}{1,957.7}$$

From the foregoing analysis of full rental value of 1 bedroom flat, we have illustrated that flooding has significant challenge of 68% on the rental value of property in the affected areas. Thus, the relationship is positive linear related. This implies that flooding has affected the rental value of one bedroom flat in the study areas.

Using Pearson product moment correlation formula

Table: 4.3

$n \sum XY - \sum x \sum Y$

$$\frac{n \sum XY - \sum x \sum Y}{\sqrt{n \sum Xx^2 - (\sum X)^2} \cdot \sqrt{n \sum Y^2 - (\sum Y)^2}}$$

Year	X no. of year	Y (N'000)	Rent XY(N'000)	X ² (N'000)	Y ² (N'000)
2010	1	150	150	1	22,500
2011	2	150	300	4	22,500
2012	3	150	450	9	22,500
2013	4	150	600	16	22,500
2014	5	150	750	25	22,500
2015	6	180	1,080	36	22,500
2016	7	180	1,260	49	32,400
2017	8	180	1,440	64	32,400
2018	9	180	1,620	81	32,400

2019	10	180	1,800	100	32,400
	$\Sigma X = 45$	$\Sigma Y = 1,650$	$\Sigma XY = 9,450$	$\Sigma X^2 = 385$	$\Sigma Y^2 = 274,500$

$$\frac{10(9,450) - (45)(1,650)}{\sqrt{10(385) - (45)^2} \sqrt{10(274,500) - (1,650)^2}}$$

$$\frac{94,500 - 74,250}{\sqrt{3,850 - 2,025} \sqrt{2,745,000 - 2,722,500}}$$

$$\frac{20,250}{(\sqrt{825})(\sqrt{22,500})}$$

$$\frac{20,250}{\sqrt{41,062,500}}$$

$$\frac{20,250}{6,408.00}$$

In the above analysis of two-bedroom flats using the full rental value, we have illustrated that flooding has significant effect 3.16 on the rental value of the two bedrooms flat in the study area is affected by flooding.

Table 4.4
Using Pearson product moment correlation formula
 $n \Sigma XY - \Sigma x \Sigma Y$

$$\frac{\int \sqrt{n} \Sigma Xx^2 - (\Sigma X)^2 \int \sqrt{n} \Sigma Y^2 - (\Sigma Y)^2 \int \sqrt{n} \Sigma XY - \Sigma x \Sigma Y}{\sqrt{10(385) - (45)^2} \sqrt{10(274,500) - (1,650)^2}}$$

Year	X no. of year	Y (N'000)	Rent XY(N'000)	X ² (N'000)	Y ² (N'000)
2010	1	180	180	1	32,400
2011	2	180	360	4	32,400
2012	3	180	540	9	32,400
2013	4	180	720	16	32,400
2014	5	180	900	25	32,400
2015	6	180	1,080	36	32,400
2016	7	180	1,260	49	32,400
2017	8	200	1,600	64	40,000
2018	9	200	1,800	81	40,000
2019	10	200	2000	100	40,000
	$\Sigma X = 45$	$\Sigma Y = 1,860$	$\Sigma XY = 19,440$	$\Sigma X^2 = 385$	$\Sigma Y^2 = 346,800$

$$\frac{10(10,440) - (45)(1,860)}{\sqrt{10(385) - (45)^2} \sqrt{10(346,800) - (1,860)^2}}$$

$$\frac{10,400 - 83,700}{\sqrt{3,850 - 2,025} \sqrt{3,468,000 - 3,459,600}}$$

$$\frac{20,700}{\sqrt{1,825}(\sqrt{8,400})}$$

$$\frac{20,700}{\sqrt{15,330,000}}$$

$$\frac{20,700}{3,915.00}$$

From the foregoing analysis of full rental value of 3 bedroom flat, we have illustrated that flooding has significant challenge of 5.28 on the rental value of property in the affected areas. Thus, the relationship is positive linear correlated. This implies that flooding has affected the rental value of 3 bedroom flat in the study areas.

Table 4.5
Using Pearson product moment correlation formula
 $n \Sigma XY - \Sigma x \Sigma Y$

$$\frac{\int \sqrt{n} \Sigma Xx^2 - (\Sigma X)^2 \int \sqrt{n} \Sigma Y^2 - (\Sigma Y)^2 \int \sqrt{n} \Sigma XY - \Sigma x \Sigma Y}{\sqrt{10(385) - (45)^2} \sqrt{10(346,800) - (1,860)^2}}$$

Year	X no. of year	Y (N'000)	Rent XY(N'000)	X ² (N'000)	Y ² (N'000)
2010	1	400	400	1	160,000

2011	2	400	800	4	160,000
2012	3	400	1,200	9	160,000
2013	4	400	1,600	16	160,000
2014	5	550	2,750	25	302,500
2015	6	550	3,300	36	302,500
2016	7	550	3,850	49	302,500
2017	8	550	4,400	64	302,500
2018	9	550	4,950	81	302,500
2019	10	900	9,000	100	810,000
	$\Sigma X = 45$	$\Sigma Y = 5,250$	$\Sigma XY = 32,250$	$\Sigma X^2 = 385$	$\Sigma Y^2 = 2,962,500$

$$\frac{10(32,250) - (45)(5,250)}{[\sqrt{10(385) - (45)^2}] [\sqrt{10(2,962,500) - (5,250)^2}]}$$

$$\frac{322,500 - 236,250}{[\sqrt{3,850 - 2,025}] [\sqrt{29,625,000 - 27,562,500}]}$$

$$\frac{85,250}{\sqrt{1,825}(\sqrt{2,062,500})}$$

$$\frac{85,250}{\sqrt{3,764,064,500}}$$

$$\frac{85,250}{61,352.0}$$

Table 4.6

From the foregoing analysis of full rental value of duplex, we have illustrated that flooding has significant challenge of 1.38 on the rental value of property in the affected areas. Thus, the relationship is positive linear correlated. This implies that flooding has affected the rental value of duplex in the study areas.

Hypothesis Two

H₀: Scarcity of accommodation in Asaba is not due to risk perception on flood prone properties by prospective tenants.

Question 10 will be used to test hypothesis two

$$X^2 = \frac{\Sigma(O-l)}{l}$$

l

Where O = the observed frequency

l = expected frequency

The degree of freedom (df) is calculated as (r-1) (k-i) where r = rows, k = columns, n = total of trials.

The level of significance adopted is 5% i.e., 0.05

Opinion	Observed frequency (O)	Expected (l)	Frequency O-l	(O-l) ²	$\frac{(O-l)^2}{l}$
Yes	30	20	10	100	5
No	10	20	-10	100	5
Total outcome	40	40	0	-	10

Expected frequency (l) = 40

n = 2

X² = 10

A table of X² distribution was consulted to determine whether the value is significant or not. In order to do this, a degree of freedom is determined. Since the sample is a one-way x², the degree of freedom is the number of cells minus one. In this case, there are only two cells, that is, "yes and no" respondents.

According to the chi — square table, the value of X² with one degree of freedom at 0.05 level of significance is 3.84. The calculated value of 10 is greater than 3.84. Therefore, the null hypothesis is rejected and the alternative accepted which states that scarcity of accommodation in Asaba is due to risk perception on flood prone residential properties by prospective tenants.

CONCLUSION AND RECOMMENDATION

The study has dealt with the challenges of flooding on rental value of properties in Asaba. Using the information gathered in table 4.0, analysis of table 4.0 – 4.6 was made possible. The result showed that flood affected properties do not command the rent with flood free properties.

The analysis from table 4.6 have also showed that flooding has created scarcity of properties as prospective tenants are threaten by flood occurrences which will bring destruction to properties and in worst case scenario loss of lives. This has left many floods affected properties: vacant/void, while properties free from flooding are in high demand but could not meet the needs of the market.

Furthermore, it was also noted from table 4.4 that although many lands were lost to flooding, yet, that is not the reason for the increased value of available land. Many of the Estate Surveyors and Valuers were of the opinion that the rapid increase in urbanization is the reason for the general increase in the value of land in Asaba and other urban areas.

In the area of flood control, many of the respondents were of the opinion that property developers should be sanctioned by government to meet building standards such as the use of water-resistant building materials for construction, sand filling and leveling and the construction of standard drainage channels within the neighbourhood to reduce the effect of flooding on properties and standardize the value of properties within the neighbourhood researched.

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