

Effect of the Year 2012 Flooding On Residential Properties Rental Value in Kaduna Metropolis of Nigeria

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Abstract: *One of the natural factors to be considered in determining property rental values is flood. Year 2012 flood was noticeable in many countries due to its severance with Nigeria not left out most especially Kaduna metropolis. This paper aims at assessing the effect of this year's flood on residential property values. Data were sourced through both primary and secondary means. Systematic random sampling was used as the affected areas list was made available by Kaduna State Agricultural Development Project. Findings revealed low rental values in both years 2012 and 2013 but rose again due to some militating measures taken by the government and developers. In addition, the cause was traced to the rivers' setback encroachment and dumping of refuse into the rivers. Recommendations made include putting in place permanent measures to check flood's reoccurrence in the metropolis, availability of flood plain area map and data on flood occurrence to the public and enforcement of development control on developers.*

Keywords: *Property Rental Values, Flood, Natural Disasters, Flood plain, Heavy Rainfall*

I. Introduction

A flood is an overflow of water that submerges or "drowns" land that may result from the volume of water within a body of water such as a river, dam, lake or breaks levees or due to accumulation of rainwater on saturated ground in an aerial flood (<http://en.wiktionary.org/wiki/flood>). Nigerian Environmental Study/Action Team (NEST) in 1991 recognized floods as environmental hazards that occur regularly every year in different parts of Nigeria and are repeatedly in the headlines of both the local and national news.

This environmental hazard used to cause much havoc to lives, real properties and economy of whichever area it occur. The effects as stated by <http://en.wiktionary.org/wiki/flood> include loss of lives, damage of buildings and other structures, and economic hardship. Over 5.5 million properties in England and Wales are at risk of flooding from rivers, the sea or surface water (Environment Agency, 2009). In the past four decades, economic losses due to natural hazards such as flood disasters have increased in fold and have also resulted in major loss of human lives and livelihoods, the destruction of economic and social infrastructure, as well as environmental damages during these periods. (MunichRe, 2002). This was supported by NEST's (1991) submission "that floods are common and recurrent phenomenon in Nigeria and in some parts of the Country they occur on regular perennial basis".

Floods are among the most devastating natural disasters in the world, claiming more lives and causing more property damage than any other natural phenomena (<http://www.cnt.org/resources/the-prevalence-and-cost-of-urban-flooding/>, 2013). In Nigeria, though not leading in terms of claiming lives, flood affects and displaces more people than any other disaster; it also causes more damage to properties. At least 20 percent of the population is at risk from one form of flooding or another. West Africa Insight special report in October, 2012 tagged the year as "**A year of raging Floods**" Researchers all over the world have studied the effects of natural disasters on property values. Some have focused on earthquakes, some concentrated on flood and other disasters. It is in this context that this paper aimed at evaluating the effect of this year's flooding on residential property's values in Kaduna town.

Objectives

- 1) To examine the causes of the 2012 flood in Kaduna.
- 2) To assess the effect of the year's flooding on residential property rents in Kaduna.
- 3) To examine the post flooding situation on residential property rents in the study area.
- 4) To proffer recommendations on how to improve the existing situation.

Statement Of The Problem

UN-ISDR (2008) posited that any increase in disasters, whether large or small will threaten development gains and hinder the Millennium Development Goals. Year 2012 was tagged by the West Africa Insight report as the year of raging flood because of the havoc it caused to both lives and properties. Alex (2013) confirmed the year's flood severance by saying The Federal Ministry of Water Resources in Nigeria has traced the cause of the 2013 in Sokoto to the 2012 flooding incidence that led to several changes in the watercourse. Flood damages on property could be multiplied if not taken care of and the economical losses would be much (Sebastian, 2012). Based on this, this research focuses on the evaluation of the effect of the 2012 flooding on property rent in Kaduna town. The research went to the extent of knowing the reasons tenants or occupiers went back to the flooded properties after the flood despite the price.

Concept Of Flooding

Environment Agency (2009) defined flooding as the unusual presence of water on land to a depth that affects normal activities, The Agency went further to point out that a disaster age usually occurs when people are not prepared for a flood due to the lack of early warning systems, preparedness and mitigation measures. Etuonovbe (2011) said flooding itself is a situation that results when land that is usually dry is covered with water of a river overflowing or heavy rain, flooding occurs naturally on the flood plains that are prone to disaster. It occurs when water in the river overflows its banks, or sometimes results from a constructed dam. It happens without warning. She went ahead to describe floods as one of the most devastating natural disasters in the world, claiming more lives and causing more property dam than any other natural phenomena.

Centre for Ecology and Hydrology (nd) opined that flooding is the result of a complex interaction between rainfall, urban and rural land surfaces, soil types, topography, drainage and river channels and other man-made changes. This Centre developed the first national flood risk maps in UK in 1995. The maps spelt out lands that were prone to flooding and marked them as recreation areas and relaxation centers.

NEST (1991) looked at flood as a body of water that rises to overflow land that is not normally submerged. The team stated man's interaction with his environment in the form of urbanization, agricultural activities, and deforestation as one major cause of flooding. Another cause mentioned was encroachment of buildings on the floodplains of streams and rivers flowing through towns and cities. The team explained further that as urbanization intensifies, buildings, paved roads and concrete surfaces replace natural surfaces. The following areas were listed as the major areas that suffer from this hazard in Nigeria are;

- (a) Low-lying areas in southern parts of the country where annual rainfall is very heavy.
- (b) The floodplains of the larger rivers, namely, the Niger, Benue, Gongola, Sokoto, Hadejia, Yedseram, Katsina, Anambra, Ogun, Kanupe, KADUNA, Gurara, Mada, Shemanker, etc.
- (c) The Niger Delta area.
- (d) Flat, low-lying areas around and to the south of Lake Chad that may be flooded during, and for a few weeks after, the rains.

Odjugo, (2012) traced the cause of flooding to three climate related phenomena which include; meteorological, climatological and hydrological. Aderogba (2012) opined that 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 used to be part of the causes of flooding in our urban areas.

In the opinion of the West Africa Insight report (2012), floods are an intrinsic part of the hydrologic cycle and are specifically linked with high incidences of rainfall and as may be expected, a variety of factors influence flood processes. Apart from other very important physical conditions of a watershed that include size, topography, geology, soil types, vegetation and land use, flood magnitudes depend on rainfall intensity, depth, timing, and spatial distribution of rain within a given watershed.

Flooding as revealed by http://www.fema.gov/hazard/flood/fl_during.shtm is the unusual presence of water on land to a depth that affects normal activities. The causes include overflowing rivers (river flooding), heavy rainfall over a short duration (flash floods), or an unusual inflow of seawater onto land (ocean flooding). Ocean flooding could be caused by storms such as hurricanes (storm surge), high tides (tidal flooding), seismic events (tsunami) or large landslides (sometime also called tsunami).

Ojo (2011) identifies causes of flood in developing nations as unregulated developments, invasion of public areas, lack of institutional capacity at municipal level, unrealistic regulations, economic pressures from developers, ineffectiveness of planning regulation by allowing development on flood plains, and poor or lack of standard drainage system on roads. Sebastian (2012) traced the causes of flood in Germany to heavy rain or snowmelt and sea level rise but also by extending settlement, flooding is one of the most common natural disasters in the world. He explained further that predictions put the occurrence to every 25 years.

Factors That Determine The Effects Of Flooding

Effects of flooding according to Bariweni, Tawari and Abowei (2012) could be classified into primary and secondary. The primary effects according to them include physical damage that can damage any type of structure, including bridges, cars, buildings, sewerage systems, roadways and canals. The secondary effects include water supplies that results in contamination of water (water pollution). Clean drinking water becomes scarce, unhygienic conditions and spread of water-borne diseases are the results. The effects of flooding from the sources outlined above were felt by various 'receptors'. These include, people, buildings, infrastructure, agriculture, open recreational space and the natural world. In extreme cases, flooding may cause a loss of life. At least 102 people are now thought to have been killed by floods in and around the south-western Nigerian city of Ibadan. Bariweni, Tawari and Abowei (2012) stressed further that floods took a deadly toll in northeastern Nigeria in August 2011. Torrential rains pushed rivers over their banks, collapsed mud houses and washed away livestock. Floodwater, resulting from heavy rains, damaged three bridges and caused a dam to overflow, submerging buildings across the city. Most of the victims were children. The social and emotional costs from flooding can also be significant and are often widespread and indiscriminate in flooded areas. These authors highlighted the costs to include displacement from homes, the loss of personal valuables and the ongoing fear and insecurity caused by the experience. The economy could also be severely affected by flooding. Businesses may lose stock, patronage, data and productivity and disruption to utilities and transport infrastructure can have knock-on effects to a wider area. Tourism, farming and livestock can equally be affected.

Bariweni, Tawari and Abowei (2012) discussed some factors that determine the effects of flooding. These include;

- a) The level of predictability: This affects the timing, accuracy and communication of warnings given before a flood.
- b) The rate of onset of the flood: How quickly the water arrives and the speed at which it rises will govern the opportunity for people to prepare and respond effectively for a flood.
- c) The speed and depth of the water: This dictates the level of exposure of people and property to a flood. It is difficult to stand or wade through even relatively shallow water that is moving. Floodwater often carries debris, including trees and water over 1m in depth can carry objects the size of cars. Fast flowing water can apply devastating force to property and other receptors.
- d) The duration of the flood: This is another important factor in determining the extent of its impact, particularly on individuals and affected communities.

Factors Affecting Rental Value

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. Sebastian (2012) revealed that price theory predicts that buyers will attempt to discount property prices for flood risk if they are aware of it. Valuation experts and mortgage lenders need to know about the value of property at risk to advise their clients and protect their investments.

According to Lamond (2009) the factors affecting rental value include significant improvements in the quality of the real estate, the location, usability (legal situation determined by regulations and laws) and property conditions (actual characteristics). Location includes external characteristics of the area (on a local and a spacious scale) as traffic situation, neighborhood (e.g. residential or business area) but also environmental influences.

II. Methodology

Data for this study emanated from the administrative records of Kaduna State Agricultural Development Project (KADP). The data collected from KADP include the date of flood events in Kaduna, affected Communities; number of people affected and associated hazards. In addition to these, the average rainfall and temperature figures for the past ten years were collected as displayed by table 1. The information were meant to establish; a) whether the cause was natural or manmade, b) the occurrence of flooding in Kaduna over time , c) evaluate its effects on residential property's values and proffer measures at mitigating the menace. Apart from the named secondary source, observation, oral interview and questionnaires were adopted to source for some data that were not included in the ones from KADP. The residential property rental values before, in 2012 and after that flooding year were compared. The results of the comparison determine any correlation between the land value and flooding. The sampled affected areas in Kaduna are;

- .Abubakar Kigo Road
Makarfi, Ononkwu
Katumba, Arforce,
Access and Lilu streets
- Rafin Guza

- Haliru Dantoro close
- NEPA close
- Libreville street by low-cost
- Ungwar Rimi
- Ramat close by Riverside
- Ramart close by Ishaku Gwoma
- Kabala market road Kabon
- Wushishi Quarters
- Bashama Road
- Barnawa Road Kaduna garden
- Romi, Television district
- Nassarawa
- Tudun wada
- Gonin Gora

Table 1: Average Rainfall and Temperature Figures for Kaduna between 2003 and 2013.

Year	Rainfall (MM)	Number of Wet days	TEMPERATURE (C)	
			Minimum	Maximum
2003	1813.76	113	227.549	397.33
2004	1684.09	99	238.11	366.41
2005	3279.11	89	229.69	357.22
2006	1746.07	94	230.37	391.96
2007	1620.23	93	234.95	393.82
2008	1252.97	68	159.07	258.83
2009	1568.10	112	117.86	262.49
2010	1517.95	113	199.06	362.45
2011	785.39	90	276.70	364.00
2012	995.80	No Record	264.40	343.20
2013				
TOTAL				

Source: Kaduna State Agricultural Development Project (KADP), 2013

III. Summary And Conclusion

Table 2: Years of Residence in the Ward

S/N	Responses	Frequency	%
1	Below 5years	5	3
2	6 – 10 years	11	8
3	11 -16years	74	49
4	Above 16years	60	40
	Total	150	100

Source: Authors' Field Survey, 2014

Table 2 shows that 40% of the respondents have been living in Kaduna for more than sixteen years. This reveals that they should know much about what had and is happening in relation to flooding in Kaduna.

Table 3: Respondents Occupancy status

Occupancy Status	Frequency	Percentage
Owner Occupier	64	43
Tenant	86	57
Total	150	100

Source: Authors' Field Survey, 2014

Table 3 presents that 57% of the respondents were tenants while 43 % were property owners. It could be deduced that the owners parked out of their properties having noticed the condition of the area as regards to flood leaving behind the tenants. It could also be because of a little bit low rent paid by the occupants when comparing with other parts of the City that are not liable to flood.

Table 4: Respondents Annual Income in Naira

Annual income (N)	Frequency	Percentage
100,000 - 500,000	5	3
600,000 - 2,000,000	11	7

2,100,000 - 5,000,000	26	18
5,000,000 - 10,000,000	61	41
Above 10,000,000	47	31
Total	150	100

Source: Authors' Field Survey, 2013

Table 4 revealed that large number of the respondents have their annual income between 5 million and 10 million naira. Followed by those that earned more than 10 million naira per year. It could be deduced from this table that the respondents inhabiting the study area were not poor people that could not afford rent in the non-flooded areas of the town but might be considering proximity to their places of work, relatively reduced rent, family ties and so on.

Table 5: Causes of Flood in Kaduna

Causes of Flood	Residents	Researchers' Rating
Drainage Problem	31(21%)	12(24%)
Poor Refuse Disposal	45(30%)	7(14%)
Heavy Rainfall	63(42%)	9(18%)
Building at Flood plain areas/ River's Setback.	11(7%)	22(44%)
Total	150 (100%)	50(100%)

Source: Authors' Field Survey, 2014

Table 5 reveals the views of both the respondents and the researchers as to causes of flood in Kaduna. Large number of the respondents (42%) attached the year's flood to heavy rainfall while 7% that was the minimum percentage attached it to building at river's setback. The researchers rating put building at river's setback as the major (44%) cause of the flood.

According to the Kaduna State Agricultural Development Project's record, 2012 flood was caused by Heavy Downpour of rain causing the Kaduna river, Hunkuyi Dam and Asso rivers to overflow their banks. Apart from this, it was revealed by this record that there were floods in the state from April to October, 2012 but that of 12th September, 2012 affected many areas. Table 1 revealed that the average rainfall for both 2011 and 2012 were lower comparing with other years.

Table 6: Frequency of the Flood

S/N	Responses	Frequency of the flooding	Frequency	%
1	Highly liable to flood	Every year/ 1 -5years	21	14
2	Moderately liable to flood	6 -20 years	34	23
3	Marginally liable to flood	Above 20 years	78	52
4	Flood free	No flooding has been recorded	17	11
	Total		150	100

Source: Authors' Field Survey, 2014

Large number of the respondents (52%) affirmed with confidence that their area is marginally liable to flood because the disaster happens in more than 20years interval. Therefore, the non-frequent nature of the disaster made it to cause many havoc because they did not think of the flood. It only caught them unaware. Some of the respondents (11%) even declared that their area is flood free that could be attached to their years of occupancy.

Table 7: Trends in Property Rental Value in Kaduna Metropolis prior to Flood Disaster

Affected Areas	Trends in Rental Value				
	Type of Property	2009 (₦)	2010 (₦)	2011 (₦)	Flood 2012(₦) yr
Abubakar Kigo Road Makarfi, Ononiwu, Katumba Airforce, Access & Lilu Street	1 bedroom	60,000	65,000	70,000	70,000
	2 bedrooms	100,000	120,000	130,000	150,000
	3 bedrooms	130,000	140,000	180,000	220,000
	Duplex	200,000	230,000	280,000	300,000
	Each rooms in tenement Property	20,000	30,000	35,000	40,000
Rafin Guza	1 bedroom	45,000	45,000	50,000	55,000
	2 bedrooms	55,000	55,000	60,000	65,000
	3 bedrooms	80,000	100,000	110,000	120,000
	Duplex	180,000	200,000	240,000	250,000
	Rooms in Tenement	15,000	20,000	25,000	30,000
Libreville Street by Lowcost	1 bedroom	50,000	55,000	60,000	60,000
	2 bedrooms	80,000	100,000	150,000	150,000
	3 bedrooms	140,000	150,000	180,000	220,000
	Duplex	190,000	210,000	210,000	320,000
	Tenement/Room	25,000	30,000	35,000	40,000
Ungwar Rimi	1 bedroom	48,000	50,000	60,000	65,000

	2 bedrooms	60,000	80,000	120,000	130,000
	3 bedrooms	120,000	150,000	170,000	180,000
	Duplex	150,000	170,000	200,000	280,000
	Tenement/Room	30,000	35,000	45,000	50,000
Ramat close by Riverside and Ishaku Gwoma areas	1 bedroom	55,000	60,000	70,000	80,000
	2 bedrooms	120,000	130,000	140,000	150,000
	3 bedrooms	150,000	180,000	230,000	250,000
	Duplex	220,000	250,000	300,000	320,000
	Tenement/Room	40,000	40,000	50,000	60,000
Kabala Market Road Kabon	1 bedroom	50,000	50,000	55,000	65,000
	2 bedrooms	75,000	80,000	90,000	100,000
	3 bedrooms	150,000	170,000	190,000	200,000
	Duplex	200,000	230,000	250,000	290,000
	Tenement/Room	45,000	45,000	50,000	55,000
Wushishi Quarters	1 bedroom	50,000	55,000	60,000	65,000
	2 bedrooms	70,000	70,000	100,000	120,000
	3 bedrooms	150,000	160,000	180,000	220,000
	Duplex	180,000	200,000	230,000	280,000
	Tenement/Room	40,000	40,000	45,000	60,000
Bashama Road	1 bedroom	35,000	35,000	40,000	45,000
	2 bedrooms	85,000	110,000	140,000	150,000
	3 bedrooms	130,000	160,000	130,000	210,000
	Duplex	180,000	200,000	230,000	240,000
	Tenement/Room	30,000	35,000	40,000	45,000
Barnawa Road, Off Kaduna Garden	1 bedroom	50,000	55,000	65,000	70,000
	2 bedrooms	70,000	80,000	90,000	100,000
	3 bedrooms	180,000	200,000	250,000	280,000
	Duplex	250,000	250,000	290,000	350,000
	Tenement/Room	30,000	30,000	40,000	50,000
Romi, Television District	1 bedroom	25,000	30,000	40,000	45,000
	2 bedrooms	70,000	80,000	110,000	130,000
	3 bedrooms	140,000	160,000	180,000	200,000
	Duplex	200,000	220,000	250,000	250,000
	Tenement/Room	30,000	35,000	40,000	45,000
Nassarawa	1 bedroom	20,000	25,000	28,000	35,000
	2 bedrooms	60,000	100,000	120,000	140,000
	3 bedrooms	150,000	160,000	200,000	250,000
	Duplex	200,000	230,000	280,000	300,000
	Tenement/Room	40,000	40,000	45,000	50,000
Tudun Wada	1 bedroom	15,000	18,000	20,000	25,000
	2 bedrooms	50,000	55,000	60,000	65,000
	3 bedrooms	70,000	85,000	90,000	100,000
	Duplex	150,000	170,000	180,000	210,000
	Tenement/Room	10,000	15,000	15,000	20,000
Gonin Gora	1 bedroom	40,000	45,000	55,000	60,000
	2 bedrooms	70,000	80,000	100,000	120,000
	3 bedrooms	150,000	170,000	200,000	220,000
	Duplex	200,000	200,000	220,000	250,000
	Tenement/Room	35,000	40,000	45,000	50,000
Source: Property Market Survey by the Authors, 2014.					

Prior to flood disaster in Kaduna Township the affected areas command high rental value as reflected in the table above. It is shown that in 1, 2, 3 bedrooms apartment at Abubakar Kigo Road there is significance upward increase in trend of property rental value prior to flood occurrence.

The same scenario is synonymous to areas such as Rafin Guza, Libreville Street by low cost, Ungwar Rimi, Ramat close by riverside Ishaku Gwoma area, Kabala market road Kabon, Wushishi Quarters, Bashama road, Barnawa road, off Kaduna Garden, Romi Television District, Nassarawa, Tudun Wada and Goni-Gora area of Kaduna – township which are all affected by the raging flood in 2012. This up-ward trend in rental value continues until year 2012 when the flood occurred. It could be concluded without ambiguity that there is stability in property rental value culminating to an upward increase on yearly basis prior to occurrence of flood disaster. Tenants had already paid before the flooding and that was the reason the 2012 rent reflected on the table 7

Table 8: Trends in Property Rental Value in Kaduna Metropolis after the Flood Disaster.

Affected areas	Trends in Rental Values		
	Type of Property	2013 (₦)	2014 (₦)
Abubakar Kigo Road Makarfi, Ononiwu, Katumba Airforce, Access & Lilu Street	1 bedroom	45,000	80,000
	2 bedrooms	80,000	150,000
	3 bedrooms	150,000	200,000
	Duplex	170,000	280,000
	Each rooms in tenement Property	20,000	50,000
Rafin Guza	1 bedroom	35,000	50,000
	2 bedrooms	45,000	70,000
	3 bedrooms	80,000	125,000
	Duplex	150,000	240,000
	Rooms in Tenement	20,000	40,000
Libreville Street by Lowcost	1 bedroom	40,000	65,000
	2 bedrooms	100,000	145,000
	3 bedrooms	150,000	210,000
	Duplex	180,000	280,000
	Tenement/Room	25,000	50,000
Ungwar Rimi	1 bedroom	45,000	75,000
	2 bedrooms	80,000	150,000
	3 bedrooms	100,000	185,000
	Duplex	170,000	300,000
	Tenement/Room	30,000	50,000
Ramat close by Riverside and Ishaku Gwoma areas	1 bedroom	60,000	80,000
	2 bedrooms	90,000	140,000
	3 bedrooms	120,000	265,000
	Duplex	190,000	280,000
	Tenement/Room	45,000	75,000
Kabala Market Road Kabon	1 bedroom	40,000	60,000
	2 bedrooms	150,000	165,000
	3 bedrooms	100,000	210,000
	Duplex	170,000	285,000
	Tenement/Room	20,000	65,000
Wushishi Quarters	1 bedroom	35,000	70,000
	2 bedrooms	105,000	130,000
	3 bedrooms	160,000	230,000
	Duplex	150,000	290,000
	Tenement/Room	30,000	75,000
Bashama Road	1 bedroom	50,000	55,000
	2 bedrooms	90,000	170,000
	3 bedrooms	150,000	220,000
	Duplex	180,000	240,000
	Tenement/Room	35,000	50,000
Barnawa Road, Off Kaduna Garden	1 bedroom	45,000	60,000
	2 bedrooms	75,000	110,000
	3 bedrooms	180,000	300,000
	Duplex	210,000	370,000
	Tenement/Room	35,000	65,000
Romi, Television District	1 bedroom	25,000	60,000
	2 bedrooms	80,000	150,000
	3 bedrooms	150,000	210,000
	Duplex	190,000	260,000
	Tenement/Room	30,000	50,000
Nassarawa	1 bedroom	20,000	40,000
	2 bedrooms	90,000	150,000
	3 bedrooms	190,000	280,000
	Duplex	220,000	330,000
	Tenement/Room	35,000	50,000
Tudun Wada	1 bedroom	20,000	30,000
	2 bedrooms	40,000	70,000
	3 bedrooms	75,000	120,000
	Duplex	180,000	220,000
	Tenement/Room	10,000	25,000
Gonin Gora	1 bedroom	40,000	45,000
	2 bedrooms	70,000	80,000
	3 bedrooms	100,000	100,000
	Duplex	200,000	210,000
	Tenement/Room	15,000	20,000

Source: Property Market Survey by the Authors, 2014.

After the flood disaster property rental value in the affected areas crumbled to less than average of the previous year prior to flood disaster. The post flood year experienced lower property rental value in all affected areas as reflected in the table showing the post flood year's rental value, i.e. year 2013.

In year 2014 being the second year of post flood period the table shows that, there is an improvement in property rental value compare to the immediate year after flood disaster. It can be conveniently asserted that there is a significant reduction in property rental value the year after the flood and a potential for recovery in the year 2014 being the second year post flood disaster. This is in line with Lamond (2009) submission that flooding has only a temporary impact on property values and that after three years price has returned to their normal market level as quoted by Sebastian (2012).

IV. Conclusion

As observed by Yande (2009) floods are responsible for up to 50,000 deaths and adversely affect some 75 million people on average worldwide every year, so it affects property values. In order to do justice to this work, the collected data were analyzed and the main findings were:

- 1) Residents preferred areas with cheap rent and land not minding the repercussions of their decisions.
- 2) Land vendors take interested buyers to the site during dry seasons when the water volume would have been reduced.
- 3) People started to go back to the flooded areas due to the temporary measures put in place by the government of the state that led to improvement in the rent.
- 4) The marginal nature of flood made people to think their areas are flooding free areas so they refused to prepare for its occurrence.
- 5) People occupy the areas because of other factors apart from the rate of the rent.
- 6) Building at rivers setback was identified as the major cause of flood by the researchers but not heavy rainfall as the average rainfall figure for other years before 2012 apart from 2011 were more as shown in table 1.
- 7) Property rental value increase yearly prior to the disaster and picked up two years after the flood year.

V. Recommendation

Based on the outcome of findings, the following are the recommendations proffered.

- 1) Sufficient data on flood frequencies, causes and other relevant ones should be made available to every citizen.
- 2) Every property at the rivers' setback should be demolished, as this will allow free movement of the rivers as well as to avoid overflow during the rainy seasons.
- 3) Public should be sensitized on areas that are prone to flooding, the implication of building at rivers' setback and dumping of refuse into flowing rivers.
- 4) To revive the rental value of properties damaged by flooding proper mitigating measures to check the disaster should be put in place.
- 5) Flood maps that will delineate the floodable areas should be prepared for Kaduna as this will discourage the act of building at flood prone areas.
- 6) Planning Authorities, Board and other relevant bodies should properly enforce development control.

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