AN ASSESSMENT OF FLOODING RISK PERCEPTION ON RESIDENTIAL PROPERTY VALUES IN ILORIN KWARA STATE

*BLDR. OWOLABI KAYODE MICHAEL; **ESV. OLOWOLERU OLAITAN ADEDEJI; ***QS TAJUDEEN OLUFEMI SALAMI


ABSTRACT
In recent time, various scholar have identified location, accessibility, neighbourhood, property design and environmental characters as factors affecting property development and values. Flooding in most cases are natural occurrence that damages life and properties whenever it occurs. In Akerebiata, I having experienced consistent flooding over the years, this paper therefore examines the effect of flooding occurrences on residential property values in the neighbourhood. The study was carried out using survey approach. A total of 120 copies of the questionnaire were administered on the residents while 91 copies were retrieved (85.9%). Also, a total of 25 questionnaires were administered on Estate Surveyors and Valuers within Ilorin, harmony axis and 15 (14.1%) were retrieved. The data collected was analysed using both descriptive and inferential statistical tools. The study found that almost 87.5% of the properties are owner occupied; prominent causes of flood are drainage problems. The study further found that there is disparity in rental values of properties in flooded and non-flooded areas. The paired sample t-test conducted showed that there is statistically significant relationship between four pairs of the properties. The study therefore recommends that construction of drainage channels should be made wide enough to drain a large quantity of water.

Keywords: Flooding, Neighbourhood, Values, Residential Property

Introduction
Water is one of the most useful substances on earth. We drink it, bath in it, clean with it and use it to cook food. We do so many things with water that without it, sustenance of life on earth is impossible. Most of the time, it is completely benign but in large enough quantities, this very same liquid we find so useful can cause a lot of havoc, it can overturn cars, demolish houses and even kill. In this sense, it is termed flooding. A flood is an overflow of an expanse of water that submerges land. It is a temporary covering by water of land not normally covered by water. Flooding is a natural and inevitable occurrence though sometimes can be caused by human activities. Flooding can be defined as an overflow that comes from a river or other body of water and causes or threatens damage. It can also be defined as high water stage in which water overflows its natural or artificial banks into normally dry land causing unpredictable damage and threat to life. 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). Floods are regularly occurring events. They can even be considered predictable natural disasters whose effects can be mitigated (Bohnsack, Bruce, Dunstan and Spring, 2008). Flooding is a common phenomenon in several parts of the world and its damaging effects cannot be overemphasized. During the 1997 flooding in Yuba California, 38,000 residents were evacuated; nearly 1000 acres of residential land, 15,500 acres of farmland and orchards, and 1700 acres of industrial land were flooded. In all, 322 homes were destroyed, 407 suffered major damages (Dunstan, 1997). Also in England and Wales, according to the UK Environment Agency (2001) over 10% of the population 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. In Northern Nigeria, 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). Flooding has wreaked havoc across many other 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 north. Over the years in Kwara, flood has remained a worrisome natural problem which successive governments in the State could not effectively solve. The present administration in kwara State however received some commendation in the attempt at reducing some of the flooded areas in the state through the commissioning of over 65 drainages (Westo, 2010). Despite the extent of work done and drainages commissioned by the State Government, these efforts have been overtaken by bad behaviour of citizens who turn these waterways into refuse dumps (Westo, 2010). Flood therefore is
still a problem in areas like Surulere, Agaka, Oloje Ipataoloje, Tawo, Sango, Oke-ose, Okeoyin, Offa Garage, Maraba, Post Office, Itaelepa, Asadan, Air port, Gabari, Ojagboru, Sobi, Harmony, Akerebiata, Offa axis, Kwara Ekiti. In most areas of the Ilorin, such as harmony axis, Sobi, and Akerabiata, flooding has posed a major concern to the occupants of properties. The access roads to some of these properties during raining season are usually in their worse states and this deteriorates year after year. In Akerabiata axis, the case is not different. Most access roads have poor drainage systems and land being a reclaimed land, with a relatively flat elevation of between 5 meters and 8 meters above sea level (Atere, 2000) flooding is inevitable. With the above background, this paper therefore examines the effect of flooding on property values in Akerebiata, Ilorin and establishes why such an area is still constantly being sort for even with the recurrent flood disasters. The study also tests whether there is significant relationship between flooding and residential property values in the study area.

Aim and Objectives
The aim of this research is to examine the risk of flooding in residential property value in Ilorin with some objectives:
- To identify the properties in the study area
- To examine the value of the properties in the study area
- To assess the effect of flooding to the value of properties in the study area

Literature Review

In developed countries, a large part of the literature concerned with flooding has focused on topics such as 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. Effects and flood damages to various economies have also been recurrent themes. As earlier stated flood is a great flow of water; an inundation; a deluge; a condition of abnormally great flow in a river (Chambers, 1993). However, flood mean different thing to different people. Equally there are many ways of categorising floods. A source might be heavy rainfall or high tides, a pathway might be a river or overland flood and a receptor could be a house, field or factory. 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). In his paper Omisore (2011) identifies six types of flooding: coastal flooding, river flooding, urban flooding, dam burst levee failures, dam spills and flash flooding.

Causes of Flooding

Since the start of history, the world has been plagued by natural disasters. An extreme natural event only becomes a natural disaster when it has an impact on human settlements and activities. 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). From a geological perspective, floods are a natural consequence of stream flow in a continually changing environment. 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 flood 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 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. The author 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. The study examined the efficiency of some drainage channels in the face of tidal waves, sea level rise and other human activities.

**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 a heterogeneous good 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. Ge and Du (2007) opine that property value is an essential aspect of property markets worldwide and determined by a variety of factors and the determination of those factors is a
significant part of property valuation. The list of the main factors affecting property values from various studies include; age, location, size, neighbourhood characteristics, economic activity, population, transport etc. (Joslin, 2005; Kauko, 2003; Paz, 2003; Oyebanji, 2003 and Olusegun, 2003). Kamali, Hojjat and Rajabi (2008) group the variables determining property values into; environmental variables, neighbourhood variables, accessibility (location) variables and property variables. On country basis, the studies carried out in UK showed that location, level of income, interest rates and population are the major factors affecting property values. While in 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. Various earlier studies had been conducted on the effect of location on property values. These studies include Burgess (1925), Hoyt (1939), Pred (1966) and Isard (1956) Hendrikse (2003). 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 Ordinance Survey of Northern Ireland data and conclude that location and structural characteristics are the key determinants of residential property values. Kauko (2003) lists a set of attributes that have been commonly used in property valuation research including accessibility factors, neighbourhood level factors, specific negative externalities, public services, taxes and density factors. Tse and Love (2000) identify four categories of attributes namely; structural, physical, neighbourhood and environmental, for measuring residential property values, using hedonic equation in Hong Kong. Similarly, Chau, Wong and Yiu (2004)
studied the effect of balconies on the residential property values in Hong Kong and found a positive effect on the value of a property irrespective of the Assessing the Effects of Flooding on Residential indiscriminate waste disposal. Atere (2000) examines the causes of floods in Akerebiata and harmony, sobi axi, Ilorin. The author 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. The study examined the efficiency of some drainage channels in the face of tidal waves, sea level rise and other human activities. 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 a heterogeneous good 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. Ge and Du (2007) opine that property value is an essential aspect of property markets worldwide and determined by a variety of factors and the determination of those factors is a significant part of property valuation. The list of the main factors affecting property values from various studies include; age, location, size, neighbourhood characteristics, economic activity, population, transport etc. (Joslin, 2005; Kauko, 2003; Paz, 2003; Oyebanji, 2003 and Olusegun, 2003). Kamali, Hojjat and Rajabi (2008) group the variables determining property values into; environmental variables, neighbourhood variables, accessibility (location) variables and property variables. On country basis, the studies carried out in UK showed that location, level of income, interest rates and population are the major factors affecting property values. While in 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. Various earlier studies had been conducted on the effect of location on property values. These studies include Burgess (1925), Hoyt (1939), Pred (1966) and Isard (1956) Hendrikse (2003). 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 Ordinance Survey of Northern Ireland data and conclude that location and structural characteristics are the key determinants of residential property values. Kauko (2003) lists a set of attributes that have been commonly used in property valuation research including accessibility factors, neighbourhood level factors, specific negative externalities, public services, taxes and density factors. Tse and Love (2000) identify four categories of attributes namely; structural, physical, neighbourhood and environmental, for measuring residential property values, using hedonic equation in Hong Kong. Similarly, Chau, Wong and Yiu (2004) studied the effect of balconies on the residential property values in Hong Kong and found a positive effect on the value of a property irrespective of the quality of the view. Oyebanji (2003) identifies seven factors that affect property values. These factors are; population (increase or decrease), changes in fashion and taste, institutional factors (these are factors relating to people’s culture, religious belief and government action), technological factors, economic factors, location and complementary uses. 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 toilet, and so on, economic factors include individual’s purchasing power, the level of interest and inflation rates in the country. Kalu (2001) argues that major considerations for property value hinge on the property’s ability to produce income, be in demand and have a good location relative to its use. He identifies other determinants of value to include scarcity, prospect of income growth, state of the economy, cost in use, government and political factors, physical attributes and taxation.

**Effects of Flooding on Property Values**

Various scholars have researched on 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 simple 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 a small sample size (62 properties) and no allowance was made for the differing characteristics between houses. In the authors’ following paper (1989), No significantly negative effect of flooding was reported. Montz (1992) examines the relationship between flooding and residential property values through repeat sales techniques, in three New Zealand communities, Te Paeroa, Te Aroha and Thames. He finds differing reactions to the disaster in different communities. For example, in Te Paeroa flood-free properties experienced a significant increase in prices following the flood event while those flooded did not. In Te Aroha the entire community experienced a decline in property values. In 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 about 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 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 different methods used by researchers in various studies. For example, some studies controlled for property attributes while others did not. Bin and Polasky (2004) uses 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 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 are 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 over capitalisation 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 over capitalisation 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 occur. 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 are flood liable. He noted that the price differentials were not uniform but varied on an annual basis. His research confirmed that the results of earlier studies that flood liable property has a lower value than similar property that is not flood liable. The study also showed that following a period of both decreasing property prices and only small annual increases in property prices, the price difference between flood liable and flood free land will decrease, provided there are no further incidences of over floor flooding.

Research Methods
In the conduct of this research, the survey, cross sectional and descriptive methods of research design were used. While the population of study consists of the 450 Residential Buildings and the 69 Estate Surveyors and Valuers in Kwara State (Nigerian Institution of Estate Surveyors and Valuers, NIESV, )Seventh Edition of the Directory of Members and Registered Firms in Nigeria. However, the sample frame comprises the 60 properties located on flooded streets of Akerebiata and the other 60 properties located on non flooded streets (information obtained from the Akerebiata Axis) out of which 14.1% (Nwana,1981) was sampled from each group along with the 25 Estate Surveying and Valuation Firms on the ilorin metropolitant. 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. In analysing the data collected, thet-test model was applied in addition to frequency tables, percentage and bar chart methods, the various types of properties in the study area. It is evident from the area according to table that more than half of the respondents reside in bungalow (65%), while 14% reside in tenement building, 8% for mini flat, and the remaining (13%) reside in other residential building.

TEST OF HYPOTHESIS
The hypothesis was tested to determine whether there is a statistically significant relationship between rental values of properties in the flooded and
non flooded areas of the study area. This was tested using the paired sample t-test from SPSS version 17.0 and the result is shown in table 7. In table 7 the first column shows the five different types of properties in the study area (flooded and non flooded areas). The second column shows the mean of the rental values of the properties while the third column shows the standard deviation of the rental values of the properties. Using the probability “p” value, [last column labelled Sig. (2-tailed)] at 5% degree of freedom the table reveals that the p values for pairs 1 – 4 were less than .05 (i.e. p = .002, .023, .002 and .029 respectively). On the contrary, the p value pair 5 was more than .05 (i.e. p = .069). It can therefore be inferred from the table that for pairs 3 and 4, there is a statistically significant difference between rental values of properties in flooded and non flooded areas while for pair 2 there is no statistically significant difference between the types of properties in flooded and non flooded areas.

Results and Discussion

QUESTIONNAIRE ADMINISTER AND RETRIEVED TABLE

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Frequency of Questionnaire Administer</th>
<th>Percentage of Questionnaire Administer</th>
<th>Frequency of Questionnaire Retrieve</th>
<th>Percentage of Questionnaire Retrieve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupand in Akerebiata</td>
<td>120</td>
<td>82.8%</td>
<td>91</td>
<td>85.9%</td>
</tr>
<tr>
<td>Estate sur. &amp; Valuers</td>
<td>25</td>
<td>17.2%</td>
<td>15</td>
<td>14.1%</td>
</tr>
<tr>
<td>Total</td>
<td>145</td>
<td>100%</td>
<td>106</td>
<td>100%</td>
</tr>
</tbody>
</table>

VARIOUS TYPES OF RESIDENTIAL PROPERTIES AVAILABLE IN FLOODED AREA AND NON FLOODED AREA

<table>
<thead>
<tr>
<th>Type of Residential property</th>
<th>Flooded Area</th>
<th>Percentage</th>
<th>Non Area</th>
<th>Flooded</th>
<th>Percentage</th>
<th>Total Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenements</td>
<td>6.3</td>
<td>7%</td>
<td>6.4</td>
<td>7%</td>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>Mini Flat</td>
<td>3.6</td>
<td>4%</td>
<td>3.6</td>
<td>4%</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>2 Bed room bungalow</td>
<td>13.5</td>
<td>15%</td>
<td>13.7</td>
<td>15%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>3 Bed room bungalow</td>
<td>9.9</td>
<td>11%</td>
<td>10</td>
<td>11%</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>4 Bed room bungalow</td>
<td>6.3</td>
<td>7%</td>
<td>5.5</td>
<td>6%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Other Residential property</td>
<td>6.3</td>
<td>7%</td>
<td>5.5</td>
<td>6%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Other Residential property</td>
<td>46</td>
<td>51%</td>
<td>45</td>
<td>49%</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Survey 2019

RENTAL VALUE OF RESIDENTIAL PROPERTIES IN FLOODED AREA OF AKEREBIATA

<table>
<thead>
<tr>
<th>Type of Residential property</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenements</td>
<td>N12,000</td>
<td>N12,000</td>
<td>N18,000</td>
<td>N25,000</td>
<td>N30,000</td>
</tr>
</tbody>
</table>
**RENTAL VALUE OF RESIDENTIAL PROPERTIES IN NON FLOODED AREA OF AKEREBIATA**

<table>
<thead>
<tr>
<th>Type of Residential property</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenements</td>
<td>N16,000</td>
<td>N18,000</td>
<td>N20,000</td>
<td>N25,000</td>
<td>N25,000</td>
</tr>
<tr>
<td>Mini Flat</td>
<td>N50,000</td>
<td>N60,000</td>
<td>N80,000</td>
<td>N80,000</td>
<td>N80,000</td>
</tr>
<tr>
<td>2 Bed room bungalow</td>
<td>N120,000</td>
<td>N150,000</td>
<td>N150,000</td>
<td>N180,000</td>
<td>N180,000</td>
</tr>
<tr>
<td>3 Bed room bungalow</td>
<td>N150,000</td>
<td>N180,000</td>
<td>N180,000</td>
<td>N180,000</td>
<td>N200,000</td>
</tr>
<tr>
<td>4 Bed room bungalow</td>
<td>N150,000</td>
<td>N180,000</td>
<td>N200,000</td>
<td>N220,000</td>
<td>N250,000</td>
</tr>
</tbody>
</table>

Source: Field Survey 2019

**CONCLUSIONS AND RECOMMENDATIONS**

Flooding is a perennial problem in Ilorin Metropolis, in general, and Akerebiata, in particular. The major causes of flooding in Akerebiata are drainage problems and water level rise. A comparison of rental values from both flooded and non-flooded areas of Akerebiata show a great disparity with rental values of properties in non-flooded areas higher than those of the flooded areas. The paired t-test conducted also shows that there is a statistically difference in the rental values of properties from both areas. Other causes of flooding identified are poor refuse disposal and heavy rainfall. The study therefore recommends a widening of the drainage systems within the area and subsequent drainage construction should take into consideration the peculiarity of the low lying nature of the soil strata in Akerebiata.

**REFERENCES**


