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# THE FLOODING EFFECT ON RESIDENTIAL PROPERTY VALUES: A CASE STUDY OF SHOGUNRO RESIDENTIAL ESTATE, AGEGE; LAGOS STATE NIGERIA

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## ABSTRACT

*This study is aimed at evaluating the impact of flooding on residential property value using Shogunro Residential Estate, Agege, Lagos State as the case study. To achieve the aim of the study, data were collected through questionnaire instrument administered on both the residents of the estate and registered Estate Surveying and Valuation firms having their offices located within the vicinity of the estate. While sixty-one (61) questionnaires were administered on the residents out of which 58 (95%) were retrieved, a total of 45 questionnaires were given to estate surveying and valuation firms out of which 30 (67%) were returned. The retrieved data were analyzed using descriptive and inferential analytical tools. Findings from the study revealed the major cause of flooding in the estate to be due to illegal of structures across drainage channels in the area. The study further revealed that flooding does not have measurable impact on the prices of properties within the estate. The study recommends demolition of illegal structures built across the drainage channels within the vicinity of the estate and infact all over the state by the state Town and Country Planning Authority and discouragement of further act in the state.*

**Keywords:** Flooding, Property Values, Shogunro Residential Estate, Agege, Lagos State, Nigeria

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## 1. INTRODUCTION

Flood is a natural phenomenon that results from overflow of water course. Flood do occur as a result of 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.

It is very natural to look forward to the rain season most especially for countries in tropical region after a protracted dry season with its attendant side effects. The season comes with the blessing of replenishing lost water for domestic, agricultural and navigational uses among others. As good as rain is, it could also become a source of worry when the water becomes excessive thereby resulting in flood leading to damages. Natural disasters are common in today's world. They are results of sudden changes in the state of natural elements due to natural forces. Most of the natural disasters are beyond human controls which cannot be accurately predicted before their occurrence. Major natural disasters such as floods, earthquakes, landslides and droughts when they occur often result to threat human life, loss of properties, affect infrastructures, agriculture and the environment. The impact of disaster could be different due to their intensity and coverage area.

Water as the saying goes "is life". This is so because almost all living things are made up of and depend on water for survival and infact it is one of the most available resources provided by nature as more than three quarter of the universe is covered by water. However, as good as water is, its excess constitutes source of disaster in form of flooding and erosion. Infact, flooding constitutes the most common natural hazard being encountered by the populace most especially by people living in erosion prone areas of the world. It is a serious source of disaster that often negatively impacts both its victims and the environment causing fatalities and coming second only after windstorms in the cost of damage caused [1].

Flooding as one of the most common environmental hazards is reported by [2] to be responsible for claiming over 20,000 lives on yearly basis apart from adversely affecting about 75 million people world-wide. Flooding according to Pearson Longman Dictionary of Contemporary English [3] describe flooding as a situation in which an area of land becomes covered with water. Flood can devastate affected communities and environs.

Flooding of residential property is a real and growing phenomenon worldwide including Nigeria by causing short and long-term detrimental problems for the victims. In Lagos State of Nigeria, raining season is not always the best of time especially for those living in areas which susceptible to flooding. It is a period that comes with the intimidating problem of flooding. Whenever the problem of flooding occurs, many homes especially those that are susceptible to flooding are swamped and properties worth millions of naira are often destroyed and sometimes human lives are involved as the flood tide sweep away everything on its path thereby leaving residents to recount their losses and tale of woes.

Flooding in Lagos State in Nigeria is predominantly caused by excessive rainfall which is very prevalent during the months of June to July of the year when the level of rainfall usually exceeds 100 mm per day most time while the second period of maximum rainfall is often experienced during the months of September and October coupled with bad drainage systems and illegal structures often built along drainage paths which often block the free flow of water into drainage channels.

Over the years, flooding has remained a source of concern to successive governments in Lagos State which they have not been able to find a lasting solution to as areas such as Mushin, Ogba, Agege, Ojodu, Lekki-Ajah and many areas often become flooded and impassable whenever it rains in the State. The effect of flooding on the value of properties has

been of serious concern to property owners, their agents or representatives and even tenants occupying properties within the affected areas. Since the late 1990s, there has been a number of severe floods in areas that were not subject to flooding in the earlier times all of which have resulted in alarming consequences on the real property values in the affected areas.

Immediately following a flood occurrence, property values often decrease because of the utility that can be derived from the affected property often reduced. Consequent upon the negative thought which people often have about occurrence of flooding as it concerns property values, this study is set out to properly evaluate the impact of flooding on residential property values in Shogunro Residential Estate, Agege area of Lagos State Nigeria.

## 2. LITERATURE REVIEW

Flooding is an occasional or annual event and only directly affects that portion of the population with properties in flood prone areas and as the indirect effects are generally short term in nature as the public especially those not directly affected by the occurrence of the flood generally forget the problems associated with this natural phenomenon after a short period. Public awareness of the impact of flooding decreases as the time period between flood occurrence increases [4].

However, in periods of extreme flood occurrences a significant proportion of the general public are directly or indirectly affected by problems associated with water inundation. Environment Agency [5] maintained that over 10% of the population of England and Wales were directly at risk of flooding and that even a greater percentage of the population was indirectly affected by flooding resulting from road closures, service disruption and loss of goods and produce.

In the same vein, [6] opined that flood prone properties as well as properties in wetlands are not considered as attractive as other residential properties and this results in a lower price or value of properties within such locations. Also, [7] and Eves [8, 4] in their various studies on the impact of flooding on residential properties concluded that properties within flood prone or wetland areas often attract reduced values when compared to similar properties located outside flood prone or wetland areas.

Also [8] in his study concluded that infrequent occurrence of flooding in some areas may result in different influence on residential property values compared to areas where flooding is more frequent. It noted further that one of the major consequent of infrequent flooding is the fact that the actual problems associated with flooding is only apparent during and immediately after flood occurrence while at other times the problems are not apparent and may in fact become a positive factor in relation to the values of the same properties earlier impacted negatively on. The residential property may have severe problems during the period of flooding but offers aesthetic water views and close proximity to water sports at all other times.

In the study conducted by [9] on the impact of flooding on residential property values in England, it was noted that apart from the physical damage often caused by floods to personal and real properties and disruption to trade, transport and services, there is also significant which flooding often impact on affected population such health effect resulting into various diseases.

In Nigeria in a study conducted by [1]) found heavy and prolonged rainfalls as well as river overflow to be the major causes of flooding in the Niger-Delta area of the country. While [11] in the examination of the impact of flooding on residential properties in Dophin Estate, Ikoyi, Lagos State Nigeria revealed flooding as having negative impact on the values of properties within the estate as incessant flooding occurrence in the estate forced both the

# The Flooding Effect on Residential Property Values: A Case Study of Shogunro Residential Estate, Agege; Lagos State Nigeria

rents and selling prices of flooded buildings in the estate drastically down thereby resulting inability of investors on properties in the estate to recover their capital outlay in good time.

### 3. STUDY AREA

Lagos State consists of Lagos region (otherwise known as Lagos Island) and its immediate hinterland. Lagos State comprises the former seventy square kilometres of the former Federal Capital Territory of Lagos and the adjoining areas of Lagos State where the life of the people is closely linked with that of the city. The real suburbs of Lagos include settlements like Agege, Agboyi, Isheri, Epe, Owutu, Ikeja, Mushin, Surulere amongst others.

Agege within which Shogunro Residential Estate is located is actually the headquarter of Agege Local Government Area and it occupies about eighteen square kilometers of land area and it is bounded in the north by Ifako/Ijaiye Local Government Area, in the west by Alimosho Local Government Area and in the south by Ikeja Local Government Area. The Agege community has been in settlement since the seventeen century by Awori descent of Yoruba race whose migrated from Isheri-Olofin to present Agege area. Shogunro Residential Estate which is the subject of this study is located within Agege Local Government Area.

### 4. RESEARCH METHODS

The data for this study were derived from both primary and secondary sources. While the primary data used was obtained through the use of questionnaires administered on residents of Shogunro Residential Estate and Estate Surveying and Valuation firms operating within the immediate neighborhood of the estate. While questionnaires were administered on the 61 residents of the estate, a total of 45 questionnaires were administered on the Estate Surveying and Valuation firms within the neighborhood and managing properties within the estate. The 45 Estate Surveying and Valuation firms are among the firms operating in Lagos State as contained in the Nigerian Institution of Estate Surveyors and Valuers, 2017 Directory. The questionnaires were administered on the Managing Partners of each of the sampled Estate Surveying and Valuation firms. A total of 58 (95%) and 30 (67%) copies of the administered questionnaires were retrieved from residents and estate surveying and valuation firms respectively. In analyzing the data collected for the study, the use was made of descriptive and inferential statistical tools. The secondary data were obtained through internets, directories, journals and published literatures.

### 5. DATA ANALYSIS, RESULT AND DISCUSSION

This section pertains to the analysis and discussion of the result of the analysis with a view to come up with useful deductions. The analyses are as contain in tables 1 to Table 1 shows the distribution and response rate to the administered questionnaires.

#### 5.1. Questionnaires Distributions and Response Rates

Table 1 below shows that 61 questionnaires were distributed to the residents while 45 questionnaires were administered to estate surveying firms operating in the immediate neighborhood of the estate.

**Table 1** Distribution and Response Rates to the Administered Questionnaires

| <b>Respondents</b> | <b>No. Distributed</b> | <b>No. Retrieved</b> | <b>Percentages</b> |
|--------------------|------------------------|----------------------|--------------------|
| Residents          | 61                     | 58                   | 95                 |
| Estate Firms       | 45                     | 30                   | 67                 |
| Total              | 106                    | 88                   | 83.0               |

A total of 61 questionnaires were administered on the residents while 45 questionnaires were distributed to the Estate Surveying and Valuation firms managing properties within the estate. Table 1 shows that while out of 45 questionnaires administered to the estate firms 30 questionnaires representing 67% were retrieved and 58 (95%) questionnaires out of 61 questionnaires administered to the resident were returned and found useful for the study.

## 5.2. Distribution of Respondents by Status within the Estate

This section shows the status of residents/respondents within the estate. To ascertain this, the residents/respondents were asked to indicate whether they were tenants or landlords within the houses they were residing in. Table 2 shows the result of their responses.

**Table 2** Distribution of the Residents/Respondents by Status

| Status   | Frequency | Percentages |
|----------|-----------|-------------|
| Landlord | 26        | 45          |
| Tenant   | 32        | 55          |
| Total    | 58        | 100         |

Table 2 shows that 26 (45%) of the respondents/residents were landlords while the remaining 32 (55%) consists of tenants. This shows that majority of residents were made up of tenants which suggests that the frequency of occurrence of flooding within the estate must have forced most of house owners to vacate and subsequently gave out their houses to tenants to avoid the menace of the flooding within the estate.

## 5.3. Period of Residency within the Estate 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 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 3 below.

**Table 3** Residency Period of Residents/Respondents in the Estate

| Length of Residency | Frequency | Percentage |
|---------------------|-----------|------------|
| 1 year & below      | 7         | 12         |
| 2 to 5 years        | 9         | 15         |
| 6 to 10 years       | 16        | 28         |
| 10 years & above    | 26        | 45         |
| Total               | 58        | 100        |

Table 3 shows that majorities (45%) of the respondent resident have lived within the estate for over 10 years period while those who have resided in the estate between the period of 5 and 10 years constitute 28% of the respondents. This suggests that majority of residents/respondents have lived in the estate for a substantial period which would afford to witness the occurrence of flooding as a result of which the information given by them can be considered reliable and useful.

## 5.4. Experience of Flooding by the Respondent Residents

To confirm experience of flooding by the respondent residents, they were asked if they have ever experience flooding since they have been residing in the estate and the result of their responses is presented in the table below.

The Flooding Effect on Residential Property Values: A Case Study of Shogunro Residential Estate, Agege; Lagos State Nigeria

**Table 4** Experience of Flooding by the Respondent Residents

| Experience Flooding Occurrence | Frequency | Percentage |
|--------------------------------|-----------|------------|
| Yes                            | 47        | 81         |
| No                             | 11        | 19         |
| Total                          | 58        | 100        |

Table 4 shows that 81% of the respondent residents have witnessed flood occurrence at one time or the other while only 19% have not had the experience. This shows that majority of the residents had been victims of flooding in the time past and this suggests that the menace of flooding constitute serious menace to the estate.

### 5.5. Factors Responsible for the Flooding of the Estate

In order to ascertain the major causes of flooding being witness in the estate, the various causes identified in the literature including heavy rainfall, poorly constructed drainage system, improper refuse disposal and illegal construction of structures across drainage channels were suggested to the respondents as the possible causes of flooding within the estate which they were requested to rank strongly agree (SA), agree (A), neutral (N), disagree (D) and strongly disagree (SD). In analyzing the responses, the ratings were assigned weight values of 5,4,3,2 and 1 respectively. The results were ranked in the order of their Relative Importance Index (RII). Table 5 below presents the analysis of the respondents' responses.

**Table 5** below presents the analysis of the respondents' responses

| Causes                                                      | SA | A  | N | D | SD | RII  | Ranking |
|-------------------------------------------------------------|----|----|---|---|----|------|---------|
| Heavy Rainfall                                              | 42 | 36 | 3 | 3 | 4  | 0.85 | 2nd     |
| Poorly constructed drainage system                          | 39 | 44 | 5 | - | -  | 0.84 | 3rd     |
| Improper refuse disposal                                    | 37 | 39 | 6 | 6 | -  | 0.82 | 4th     |
| Illegal construction of structures across drainage channels | 52 | 28 | 7 | - | 1  | 0.87 | 1st     |

Table 5 shows illegal construction of structures across drainage channels was ranked first and above all other causes amongst the factors responsible for flooding in the as estate. Heavy rainfall was ranked 2<sup>nd</sup> while poorly constructed drainage systems was ranked 3<sup>rd</sup> in the order of importance among causes of flooding in the estate. Improper refuse disposal ranked 4<sup>th</sup> and at the least of the causes. The result obtained from the analysis of respondents' responses to the causes of flooding in the estate was not unexpected as visit to the estate showed that buildings were conspicuously illegally built across the drainage channels thereby obstructing free flow of water through the channels which often result to flooding whenever there is heavy downpour.

### 5.6. Reasons Given by the Residents for Still Residing in the Estate Despite the Incessant Flooding of the Estate

Despite the incessant flooding of the estate, residents still reside in the estate. To ascertain the reason(s) for continue stay of residents in the estate, they were asked to pick out of the reasons provided, what has been keeping them in the estate thus far. The reasons given are ranked in the Table below.

**Table 6** Reason for Still Residing in the Estate

| Reasons                                                    | SA | A  | N | D | SD | RII  | Ranking |
|------------------------------------------------------------|----|----|---|---|----|------|---------|
| Inability to raise money for another accommodation         | 52 | 28 | 7 | - | 1  | 0.87 | 1st     |
| Security being enjoyed in the estate                       | 39 | 44 | 5 | - | -  | 0.84 | 3rd     |
| Affordable rent being enjoyed in the current accommodation | 42 | 36 | 3 | 3 | 4  | 0.85 | 2nd     |
| Proximity to working place                                 | 37 | 39 | 6 | 6 | -  | 0.82 | 4th     |

Table 6 shows inability of the respondent residents to be the number one reason for their continuing stay in the estate while the affordable rent which prevailing within the estate ranked 2<sup>nd</sup> amongst the reasons why the tenants are still remaining in the estate. The extent of security being enjoyed within estate and proximity of the estate to working places of the residents were ranked 3<sup>rd</sup> and 4<sup>th</sup> respectively by the respondent residents.

### 5.7. Impact of Flooding on the Value Residential Properties within the Estate

In order to achieve the objective of the study, the Estate Surveying and Valuation firms responsible for the management of properties within the estate were asked to pick price range of different flats in the estate immediately before and after the last occurrence of flood in July 2016. The paired t-test method of analysis was adopted and used to analyze the data collected. This method was used to analyzed the difference in mean between two variables on a before and after basis. It is meant to ascertain if there is or there is not a statistically significant difference between prices before and after the last flood occurrence in the estate. In interpreting the result, if p-value (significant value- sig. 2-tailed) is less than 0.05, the result shows that the differences are significantly significant. However, if the p-value (significant value. 2 2-tailed) is more than 0.05, the result shows that the differences have no statistical significant. If the pairing is effective, the Pearson correlation coefficient ® would be positive and higher than the significant value. This shows that the paired samples have a significant correlation. But if Pearson correlation coefficient (r) is negative, the pairing is considered to be counterproductive.

**Table 7 Paired Samples Statistics**

|               | Mean        | N  | Std Deviation | Std Error Mean |
|---------------|-------------|----|---------------|----------------|
| Pair 1 Before | 293333.3333 | 30 | 38244.52481   | 6982.46298     |
| After         | 306833.3333 | 30 | 59052.16620   | 10781.21859    |

Table 7 shows that the mean value of rental values after the flood occurrence to be higher than the mean value of rental prices before the flood occurrence. This shows that the differences between the rental prices before and after flood occurrence are positive.

**Table 8 Paired Samples Correlation**

|                     | N  | Correlation ® | p-value |
|---------------------|----|---------------|---------|
| Pair Before & After | 30 | .340          | .066    |

Table shows that there is a positive significant correlation between the rental price range of 3-bedroom flats before and after flood occurrence because the correlation ® is positive and p-value (significant value) is smaller than the correlation value.

**Table 9 Pair Samples Test**

|                       | Paired Differences |               |                |                                           |            | T       | Df | Sig. 2 Taile d |
|-----------------------|--------------------|---------------|----------------|-------------------------------------------|------------|---------|----|----------------|
|                       | Mean               | Std Deviation | Std Error Mean | 95% Confidence Interval of the Difference |            |         |    |                |
|                       |                    |               |                | Lower                                     | Upper      |         |    |                |
| Pair1: Before - After | - 13500.00000      | 58444.63929   | 10670.48244    | - 35323.58697                             | 8323.58697 | - 1.265 | 29 | .216           |

The analyses shown in Table 9 above shows that there is no statistical significant difference between the rental prices before and after the 2016 flood occurrence in Shogunro Residentia Estate as the significant value is greater than 0.05.

## 6. CONCLUSION AND RECOMMENDATION

The result of the analysis from the study shows that there is no statistical difference in price between what obtained in the period prior to the occurrence in flooding of the estate in 2016 and the period immediately preceding the occurrence of flooding. The study also hinged the continue stay in the estate by resident on the reason that bother on the inability of residents to raise enough money to pay for alternative accommodation outside of the estate coupled with affordable rents that obtain in the estate amongst other reasons.

The study 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 estate 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 construction of proper drainage systems in the whole of the state while citizenry of the State are to be discouraged from the act of dumping their refuse indiscriminately in the drainage channels provided in the State.

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