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AN ASSESSMENT OF THE IMPACT OF CLIMATE CHANGE ON PROPERTIES WITHIN VICTORIA ISLAND, ETI-OSA LOCAL GOVERNMENT AREA, LAGOS.

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Abstract:

Climate change and its associated hazards such as flooding raise the question on to what extent and how the changing climate has affected real estate property values. The aim of this study therefore is to evaluate the impact of climate change on property values within Victoria Island, Eti-osa Local Government Area of Lagos State with the objectives of identifying climatic change factors and its causes, assessing the state of properties and change on the cost and value of properties in the study area. Questionnaire survey was adopted for the study in order to obtain information from the respondents. A total of 97 questionnaires were administered on the respondents using random sampling techniques, however only 78 questionnaires were correctly filled and retrieved for analysis, representing 80.41% response rate. The collated data were further analyzed with the aid of both descriptive and inferential analytical techniques such as frequency distributions and percentages as well as correlation analysis of data. The study among other things revealed that, residential properties between 20-25 metres from the flood plains had rental values at a range of ₦1, 200,000 to ₦7, 000,000, compared to properties 50 metres away from the flood plains; which had a range of ₦800, 000 to ₦4, 000,000. There was a negative correlation between the rental values in both situations, as the farther the property from the flood plain, the lesser the rental value. Finally, the study rested on the opinion that the impact of climate change on properties closer to the flood plains are higher in its capital and rental value, and its negative impact is well pronounced in the decorative and structural value of properties closer to the flood plains, than those further from it in the study area.

Keywords: Climate Change, Flood Plain, Residential Property, Coastal Dwellings, Property Values, Flood Mitigation.

1.0 Introduction:

Climate change is said to be the effect of global warming, as scientists prefer to speak more about climate change than global warming [1]. Climate change has become the primary environmental threat of the 21st century. It is now on the global political agenda as never before. The efforts to reach a common global approach to tackling climate change culminated in the December 2009 Copenhagen Conference and the formulation of a global legally non-bidding climate change accord (Copenhagen Accord).

The current concern is based on a number of recent scientific analyses that suggest that potential climate change effects are at a scale that adds urgency not only to the efforts to prevent additional change, but equally important, to efforts to adapting to the impacts already occurring.

Climate change also indicates a change in either the mean state of the climate or in its variability, persisting for decades or longer [2]. Such change(s) can be man-made or natural. They include average global temperature, frequency of heat waves, droughts, floods, storms and other extreme weather in regions [3,4].

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At the most basic level, more people on the planet means more consumption, more emissions and heightened climate change (5).

Lagos is a state in the southwestern geopolitical zone of Nigeria. It has the smallest land area of Nigeria's 36 states. It is the nation's largest urban area, major financial centre and arguably the most populous and important state of the country. It has twenty (20) Local Governments in total.

This study has adopted Victoria Island, Eti-osa Local Government Area Lagos as its scope and the reason for its selection is due to its coastal location as well as the reoccurring climate change effects of flooding, which is pronounced in the area.

Victoria Island is the main business and financial Centre of Lagos. The town and island lies within the boundaries of Eti-Osa Local Government Area. As an expensive and exclusive area in Lagos state, it is host to major business headquarters and prime properties. It is host to a good number of consulates, embassy branch offices and deputy high commissions of other nations.

Also, the study covers only residential and commercial properties located in the study area as the impact of flooding on these properties has great social and economic consequences on human existence.

2.0 Review of Literature

The concentration of greenhouse gases has risen over the years due to human population growth. Such growth has led to increasing demands for energy and land resources. The increase in resource consumption and production processes has been compounded by population factors, such as growth, distribution and movement. The migration from rural to urban settlements has contributed immensely to the rate of climate change, as there is a tendency for the emission of greenhouse gases per head (6).

In the property markets, low-cost housing has become the need due to lack of adequate housing for the masses. Unfortunately, the low cost housing market continues to remain constrained due to Nigeria's under-developed mortgage market.

The more desirable a property is to an owner-occupier, the easier it will be to resell. It does not mean you will get a higher price, just that it would move more quickly. Similarly, the more desirable a property is to a tenant, the easier it will be to re-let with minimal void periods (7).

Amidst the depression of the Nigerian economy in 2016, the Lagos Island sub-locations of Ikoyi, Victoria Island and Lekki Phase 1, all saw house prices move in different directions. In Ikoyi, Asking House Prices were down by -12.29%. Also in Victoria Island, Asking House Prices fell by -10.62%. The drop in Asking House Prices in both sub-locations can simply be attributed to the excess supply of houses on the market for sale and waning demand for housing due to few buyers, bringing about a low volume of transaction activities in these locations (8).

Flooding which is a result of increases in the amount and intensity of rainfall, can be a threat to the transportation networks in the area. These include localized street-flooding, flood damages to roads and railway system and in extreme cases, the submerged and collapse of bridges. An increase in rainfall amount will lead to increased ground movement and changes in ground water will accelerate degradation of materials, structures and foundations of transport infrastructure. The result would be reduction in life expectancy, increased maintenance costs and potential structure failure during extreme events such as flooding (9)

The irony in climate change as a global problem is that developing countries who contribute the least to cause the problems are the most vulnerable to its impact. They are the most vulnerable because they are least endowed with resources and technology to combat the problem and their economies are based largely on natural resources – dependent sectors that are climate sensitive. Nigeria happens to be one of those countries. Nigeria's vulnerability to climate change comes both from being located in the tropics, and from various socioeconomic, demographic, and policy trends limiting its capacity to adapt to change (10).

Examples of climatic change impacts include drought, hurricanes, winter weather and wildfires. Issues that climate change might aggravate in the region include; water quality, inland drainage problems, population and development growth, air quality, localized poverty, transportation, disruptions and power disruptions (11).

Real estate is a common attraction for institutional investors' portfolio. Its inclusion in the portfolio could lead to diversification and risk reduction for the entire portfolio. The effect of climate change on the investment portfolio performance is linked to decreasing operational performance mainly caused due to extreme changes in weather conditions caused due to climate change are capable of reducing the life span of buildings. The impact of climate change has been considered to have both short term and long term effects. The physical impacts of climate change on the real estate sector are mainly decreased in the durability and performance of the material, pressure on water resources and subsidence due to which delays in construction might become repetitive (12)

In 2008, the Eko Atlantic project officially kicked off, with nine (9) kilometers of land space reclaimed from the sea. The distance of buildings to the flood plains are shown as follows:

Table 1: Distance of Buildings in the Study Area to Flood Plain

Distance of building to flood plain	Frequency	Percentage
Between 20m-50m	19	5.8
Above 50m	306	94.2
Total	**325**	**100**

SOURCE: Oyinloye, Ajayi and Olanibi (2016).

This revealed that most of the buildings in the study area have set backs above 50m from the flood plain. At that time, even though majority observed setback in the study area, it was discovered that the study area falls within the slope of 0-9.163m which constitutes about 90% of the total land area. The implication of that then was that, there was every possibility that water will be draining from the surrounding environment to the study area making the area to be waterlogged and consequently results to flooding. The coastal region in Nigeria experience perennial floods owing to its location, low-lying topography and heavy rainfall which is considered to be vulnerable to incessant flooding because of its location and slope characteristics (13).

Climate-related phenomena such as flooding and heat waves can directly impair the performance and longevity of buildings and infrastructure. These phenomena can also alter the nature and magnitude of environmental impacts and associated with a particular project, such as surface run—off and releases of hazardous substances. Finally, climate change can increase the vulnerability of the surrounding environment (human and natural) to the environmental impacts of a project. For instance, prolonged droughts can make aquatic ecosystems more vulnerable to water withdrawals or discharges from a project. Local changes in climate and ecosystem functioning can also make certain species more vulnerable to any disruptive impacts caused by a building project (14)

In Victoria Island, there have been changes in its sea-levels and landmass, which has impacted the properties located in the area. The table below defines its variability:

Table 2: Sea-Level Analysis of Victoria Island Coastal Areas

	1964	1984	2000	2011
Landmass Lost	-	542.65ha	47.00ha	114.84ha
Landmass Gained	-	280.36ha	476.18ha	490.47ha
Landmass (Unchanged)	2004.28ha	2004.28ha	2238.12ha	2599.46ha
Water body (Unchanged)	-	8226.56ha	8272.11ha	7828.64ha

SOURCE: Oluwadebi, Okeke and Akinyele (2016).

From table 2, in 1984 there was a loss in landmass of 542.65ha from its original 11,054ha size in 1964. But by 2000, the loss had reduced substantially (47.0ha) due to the landmass gain in that year (476.18ha). There is a wide gap in landmass and water body unchanged for both years 2000 and 2011, as there happens to be reduction in water body size and an increase in landmass size. This specifically is the case with the study area as at 2008, its land reclamation program had commenced.

Nigerian floods have affected many settlements such as Lagos, Ibadan, Calabar, Makurdi, Lokoja, Bayelsa and so on. A proper strategy for combating those floods would not only focus on the provision of relief materials, but will also consider the drainage system in terms of apparent need for de-silting of gutters, possible expansion of existing gutters and the construction of new ones where necessary, so as to prepare for the containment of future storm-water runoff. Inland rivers and lakes should also be properly dredged while sea defenses should be constructed along the country's coastlines to contain sea level rise (15).

For the purposes of real estate risk management, it is essential that all natural hazards are covered, which have significant influence on the risk situation of a property. A risk information system should be prepared towards properties prone to climate change risk and should include information such as information at the property level, consideration of the vulnerability of an individual building, consideration of natural hazards in the examined area, consideration of climate change and public vulnerability. Sound information basis is needed for adaptation strategies, mitigation strategies and climate risk management (16).

Summary of the Property Market in Victoria Island in 2016

As at 2016, the Nigerian economy was going through one of its worst recessions in history as the country's Gross Domestic Product (GDP) recorded a negative growth in the first two quarters of the year at -0.36% (q1) and -2.06% (q2) respectively and by the third quarter GDP had fallen by -2.24% according to data released by the Nigeria Bureau of Statistics (NBS).

The effects of the recession included rising inflation as the prices of basic commodities including building materials increased astronomically (the cost of cement rose by 40%) in the country, a rise in the unemployment rate as jobs were lost due to struggling businesses as all sectors of the economy felt the crunch of the recession and rising interest rates on bank loans. The country's real estate market was not spared as it suffered its own share of the decline in GDP as transaction activities fell in the year

Figure I: Lagos House Price Growths 2010-2016
SOURCE: Residential Auctions Company (2016)

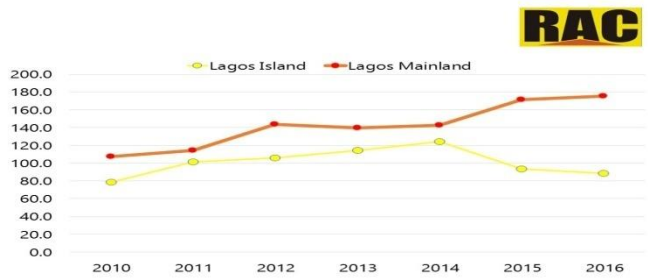

Figure II: Lagos House Price Index 2010-2016
SOURCE: Residential Auctions Company (2016)

The Lagos Island sub-locations of Ikoyi, Victoria Island and Lekki Phase 1 all saw house prices move in different directions in 2016. In Ikoyi, asking house prices were down by -12.29%. Also in Victoria Island, asking house prices fell by -10.62%. The drop in asking house prices in both sub-locations can simply be attributed to the excess supply of houses on the market for sale and waning demand for housing due to few buyers, bringing about a low volume of transaction activities in these locations. However, in Lekki Phase 1, asking house prices rose by 15.53% due to renewed interest and demand for houses in this location.

4.0 Methodology

In this study, the survey research approach was adopted. The data used in the study were gathered from four major sources which include; published and unpublished works, responses from study questionnaire, interviews with relevant respondents and observation schedules.

Essentially, these sources of data have been classified into primary (interviews, discussions, personal observations and returns from questionnaire respondents) and secondary categories (published and unpublished literature of various authors) that is, data from textbooks, journals, magazines, newspapers, seminars, conference papers, encyclopedia, Gazettes, Statutes, online materials, etc. have been utilized in this study.

The population of study comprises the properties in Victoria Island, Lagos. The total number of buildings in the study area according to Oluwatobi, Okeke and Akinyele (17), is three thousand two hundred and forty-eight (3,248). With a given population of study as 3,248, Taro Yamane's formula was employed to determine the sample size.

Taro Yamane Formula

$n=N/(1+N(e)^{2})$ (it could be 0.10, 0.05, 0,01).
n = Sample size
N = Population under study
e = Margin error (using a margin error of 0.10)
$n = 3248/ (1 + 3248(0.10)^{2})$
3248/(1+3248 (0.01)
3248/(1+32.48)
3248/33.48
= 97.01

Therefore, the sample of the study used is 97. Thus a simple random sampling technique is used in the study to ensure equal opportunity of participation of members within the population. In order to ensure maximum responses to the questionnaires, respondents were briefed regarding the purpose of the survey and reassured that the information provided will be kept confidential and will be used for research purposes only. The total number of questionnaires administered during the survey was 97 and was distributed to respondents of the four major roads/street as below:
Ozumba Mbadiwe Road (23)
23/97 X 100 = 23.7%,
Akin Adesola Street (25)
25/97x 100 = 25.8%,
Adeola Odeku Street (22)
22/97x100 = 22.6%, and
Ahmadu Bello Way (27)
27/ 97x 100 = 27.8.
The questionnaire was administered to tenants, homeowners, corporate workers and staff of various estate and quantity surveying firms. Out of 97 questionnaires administered, 78 were retrieved representing a response rate 80.41% (i.e. 78/97 x 100 = 80.41%) which was used for the analysis.
The major instrument for data collection was questionnaire. However, the methods used in analyzing the data include statistical percentages, frequencies and correlation analysis. Data was processed using Microsoft Excel in determining the correlation of rental and capital values of properties at 20-50 meters and above 50 meters from flood plain respectively.
In respect of the percentages, responses that attain an acceptance level of 50% and above are accepted as having reached the confidence limit while those below that percentage (50%) are deemed rejected.

5.0 Results and Discussion

The administration of questionnaire to tenants, homeowners, corporate workers and firms involved in the practice of Estate Surveying and Valuation and Quantity Surveying in the study area was done personally and the responses were analyzed accordingly. The study area was partitioned into 4 major streets, namely; Ozumba Mbadiwe Road, Akin Adesola Street, Adeola Odeku Street and Ahmadu Bello Way. 97 questionnaires were distributed in the area and 78 were successfully completed, returned and analyzed. The response rate was 80.4%, which was found substantial for convincing analysis.

Table 3: Distribution of Respondents Status

Respondents	Frequency	Percentage (%)
Property/Homeowner	21	26.92
Tenant	27	34.62
Corporate worker	30	38.46
Total	**78**	**100**

SOURCE: Field Survey, 2017.
Table 3, shows that most of the respondents are corporate workers (38.46%), whose workplaces were in the study area, followed by tenants (34.62%) and then property/homeowners (26.92%).

Table 4: Respondents' Awareness of Climate Change

	Frequency	Percentage (%)
Yes	69	88.46
No	9	11.54
Total	**78**	**100**

SOURCE: Field Survey, 2017.
Table 4 reveals that the level of awareness of climate change among respondents is quite high showing that 88.45% of the respondents are aware of climate change as against 11.54 who are not.

Table 5: Adverse Effect of Climate Change Factor on Properties

Factors of Climate change	Frequency	Percentage (%)
Heat waves	24	30.77
Flooding	11	14.10
Sea-level rise	-	-
Change in harmattan and rainy season	43	55.13
Total	**78**	**100**

SOURCE: Field Survey, 2017.

Table 5 reveals that, 43 (55.13%) respondents indicated that change in harmattan and rainy season adversely affected their property, followed by 24 (30.77%) respondents which admitted heat waves as a factor, while 11(14.10%) respondents claimed flooding as a factor which has adversely affected their property

Properties in most coastal regions have been faced with the challenge of sea-level rise or flooding. Efforts have also been put in place to combat the sea surges, as well as channel its flow. From the study, it was discovered that most property owners and dwellers had accepted the fate of their properties in the study areas, as they considered the climatic impact as unavoidable.

Flooding still constitutes a threat to properties in the study area. This is further worsened by Government projects that are still in progress and faulty canals. Another issue of particular interest is the lack of drainage facilities in the area of study that can cater for the drainage needs of the populace.

The extension of land space through the Eko Atlantic land reclamation programme at the study area has boosted property values along Ahmadu Bello Way. This has heightened the interest of potential property investors in real estate along Ahmadu Bello way, as the prospects associated with the undergoing project has been perceived to be profitable

Table 6: Rental Value Information for 1 – 3 Bedroom Flats in Victoria Island 2008– 2017

S/N	1 Bedroom(₦)	2 Bedroom(₦)	3 Bedroom(₦)
2008	1,500,000	1,800,000	3,000,000
2009	1,600,000	2,000,000	3,200,000
2010	1,600,000	2,400,000	3,500,000
2011	1,700,000	2,500,000	4,000,000
2012	1,900,000	2,900,000	4,700,000
2013	1,900,000	2,900,000	4,000,000
2014	1,800,000	3,000,000	4,500,000
2015	1,800,000	4,500,000	5,500,000
2016	2,000,000	3,000,000	4,900,000
2017	2,000,000	3,000,000	5,000,000

SOURCE: Field Survey, 2017.

From table 6, the rental value of 1 bedroom flat is 2,000,000 in 2017, compared to 2012 when it was 1,900,000. The rental values are an average of rents passing on similar properties in the market. Some rental values were higher than the succeeding year; the case of 1 bedroom rent in 2013 which is higher than that of 2014 and 2015. This was due to the state of the economy, as its influence could be felt in the property market.

Table 7: Capital Value Information for 1-3 Bedroom Flats in Victoria Island 2008- 2017

S/N	1 Bedroom(₦)	2 Bedroom(₦)	3 Bedroom(₦)
2017	40,000,000	50,000,000	65,000,000
2016	35,000,000	48,000,000	60,000,000
2015	45,000,000	50,000,000	65,000,000
2014	40,000,000	45,000,000	58,000,000
2013	38,000,000	40,000,000	55,000,000
2012	40,000,000	45,000,000	60,000,000
2011	45,000,000	40,000,000	60,000,000
2010	35,000,000	38,000,000	50,000,000
2009	40,000,000	35,000,000	55,000,000
2008	30,000,000	40,000,000	50,000,000

SOURCE: Field Survey, 2017.

From table 7, the capital values are an average of sales passing on similar properties in the market. Some capital values were higher than the succeeding year; the case of 3 bedrooms sale in 2012 which is higher than that of 2013 and 2014. This was due to the state of the economy, as its influence could be felt in the property market. It is also important to note that these values differ location-wise. That is, it is greater in value in some areas than others under the study area.

Also, the study discovered a trend in values of properties closer or farther from the previous flood area. It is interpreted as follows:

Table 8: Correlation Analyses between Rental Values of Residential Properties and their Distance to the Previous Flood Area

Correlation Coefficient (Residential Properties)

X	Y	X^2	Y^2	XY	X-X	Y-Y	$(X-X)^2$	$(Y-Y)^2$
1.2	0.8	1.44	0.64	0.96	-2.6	-1.275	6.76	1.63
2.0	1.5	4	2.25	3	-1.8	-0.575	3.24	0.33
5.0	2.0	25	4	10	1.2	-0.075	1.44	0.0056
7.0	4.0	49	16	28	3.2	1.925	10.24	3.71
15.2	**8.3**	**79.44**	**22.89**	**41.96**			**21.68**	**5.6756**

Mean Standard Deviation

$\frac{Ex}{n} = \frac{3.8}{4} = \frac{E(x-x)2}{Ex} = \frac{21.68}{15.2} = 1.4263$

$\frac{Ey}{n} = \frac{2.075}{4} = \frac{E(Y-Y)2}{EY} = \frac{5.6756}{8.3} = 0.6838$

S.D = $\sqrt{v}$

= $\sqrt{1.4263}$ = 1.1942

= $\sqrt{0.6838}$ = 0.8269

Correlation Coefficient

$$\mathbf{r} = \frac{n(Exy)-(Ex)(Ey)}{\sqrt{[nEx^2-(Ex)^2][nEy^2-(Ey)^2}}$$

$$r = \frac{4(41.96)-(15.2)(8.3)}{\sqrt{[4(79.44)-(15.2)^2][4(22.89)-(8.3)^2}}$$

$$= \frac{167.84-126.16}{\sqrt{[317.76-231.04][91.56-68.89]}}$$

$$= \frac{41.68}{\sqrt{[86.72][22.67]}} = \frac{41.68}{\sqrt{1965.64}}$$

$$\frac{41.68}{44.3389}$$

=0.94003 (correlation coefficient)

Table 9: Correlation Coefficient (Residential Properties) Presentation

Distance of Building to previous flood plain	**Rental Value (Residential Properties)**			
	1 Bedroom Flat	2 Bedroom Flat	3 Bedroom Flat	4 Bedroom Flat
Between 20 – 50 Meters (A)	1, 200, 000	2, 000, 000	5, 000, 000	7, 000, 000
Above 50 Meters (B)	800, 000	1, 500, 000	2, 000, 000	4, 000, 000
Correlation analysis between rental values of properties 20 – 50 Meters and above 50 Meters from flood plain		A	B	
	A	1		
	B	0-940031	1	

SOURCE: Excel Spreadsheet, 2017.

Table 9 shows that a correlation coefficient of -1, indicating that as variable x increases, variable y decreases. It is a negative correlation, as the increase in rental values of the residential property types, 20-50 Meters from the previous flood plain, shows corresponding lower figures with those above 50 Meters from the flood plain. Properties in Section A and B are negatively correlated at (0.94).

This simply means that the value of residential properties decreases with their distance from the flood plains or sea. In other words, the greater the distance the property is from the flood plains, the lower the value and vice versa.

Table 10: Correlation Analyses between Rental Values of Commercial Properties and Their Distance to the Previous Flood Area

Correlation Coefficient (Commercial Properties)

X	Y	X^2	Y^2	XY	X-X	Y-Y	$(X-X)^2$	$(Y-Y)^2$
1.5	1.5	2.25	2.25	2.25	-2.25	-1.45	6.8906	2.1025
3.0	2.8	9	7.84	8.4	-1.125	-0-15	1.2656	0.0225
4.0	3.5	16	12.25	14	-0.125	0.55	0.0156	0.3025
8.0	4.0	64	16	32	3.875	1.05	15.0156	1.1025
16.5	**11.8**	**91.25**	**38.34**	**56.65**			**23.1874**	

Mean **Standard Deviation**

$\frac{Ex}{n} = \frac{16.5}{4} = 4.125$ $\frac{E(x-x)2}{Ex} = \frac{23.1874}{16.5} = 1.4052$

$\frac{Ey}{n} = \frac{11.8}{4} = 2.95 \frac{E(Y-Y)2}{EY} = \frac{3.53}{11.8} = 0.2991$

S.D = $\sqrt{v}$

= $\sqrt{1.4052}$ = 1.1854

= $\sqrt{0.2991}$ = 0.5469

Correlation coefficient formular

$\mathbf{r} = \frac{n(Exy)-(Ex)(Ey)}{\sqrt{[nEx^2-(Ex)^2][nEy^2-(Ey)^2}}$

$r = \frac{4(56.65)-(16.2)(11.8)}{\sqrt{[4(91.25)-(16.5)^2][4(438.34)-(11.8)^2}}$

$= \frac{226.6-194.7}{\sqrt{[365-272.25][153.37-139.24]}}$

$= \frac{31.9}{\sqrt{[92.75][14.12]}} = \frac{31.9}{\sqrt{1309.63}}$

$= \frac{31.9}{\sqrt{1309.63}}$

$= \frac{31.9}{36.1888}$

= 0.881488 (Correlation Coefficient)

Table 11 : Correlation Coefficient (Commercial Properties) Presentation

Distance of Building to previous flood plain	**Rental Value (Commercial Properties)**			
	1 Bedroom Flat	2 Bedroom Flat	3 Bedroom Flat	4 Bedroom Flat
Between 20 – 50 Meters (A)	1, 500, 000	3, 000, 000	4, 000, 000	8, 000, 000
Above 50 Meters (B)	1, 500, 000	2, 800, 000	3, 500, 000	4, 000, 000
Correlation analysis between rental values of properties 20 – 50 Meters and above 50 Meters from flood plain		A	B	
	A	1		
	B	0-881488	1	

SOURCE: Excel Spreadsheet, 2017.

Table 11 shows that a correlation coefficient of -1, indicating that as variable x increases, variable y decreases. It is a negative correlation, as the increase in rental values of the commercial property types, 20-50 Meters from the flood plain, shows corresponding lower figures with those above 50 Meters from the flood plain. Properties in Section A and B are negatively correlated at (0.88).

This simply means that the value of commercial properties decreases with their distance from the flood plains or sea. In other words, the greater the distance the property is from the flood plains, the lower the value and vice versa.

The Eko Atlantic project has been tested by the DHI Institute in Copenhagen, Denmark; a world renowned institution in building development. Such tests proved the prospective City's capacity to withstand a 100-year ocean surge, one in 120 years, one in 150 years and one in 1000 years (Tsunami-level). Such capacity has been perceived to be due to the protection around the City, accropodes which are 8-9 metres above sea level.

There is a greater concentration of commercial properties in Victoria Island than any other form of property investments put together. The property market in Victoria Island has begun to gain momentum right after the devastating effects of stagflation experienced midway in the previous year (2016). Also, the demand for properties in the study area has been fuelled by security demands, taste and prestige.

Finally, the fact that properties closer to the flood plains or land reclamation area are more expensive than those further off raises the question on man's rationality. It is assumed that the greater the degree of risk associated with a property investment in a location unfavourable for its yield, the lesser the investor's choice of such investment. However, that is not the case for most property owners in Victoria Island who pride themselves in owing luxury estates and chattels near to the flood plains at ridiculously high sums.

6.0 Conclusion and Recommendations:

This work sought to understand the impact of climate change on properties, especially from the factor; flooding, which is particular amongst coastal dwellings. It is believed that the values of properties in these areas would continually be in the increase, but efforts should be put towards curbing social costs and encouraging sustainable development.

In line with the data collected and its analysis, the following are the findings of the research:

Flooding still constitutes a threat to properties in the study area. This is further worsened by Government projects that are still in progress and faulty canals. Another issue of particular interest is the lack of drainage facilities in the area of study that can cater for the drainage needs of the populace.

The extension of land space through the Eko Atlantic land reclamation programme at the study area has boosted property values along Ahmadu Bello Way. This has heightened the interest of potential property investors in real estate along Ahmadu Bello way, as the prospects associated with the undergoing project has been perceived to be profitable.

Government should come to terms with its duty of enforcing environmental laws. People should be made aware of their social responsibility of caring for the environment and be discouraged from disposing their wastes wrongly in canals or drainages. There should be specific disposal systems for type of wastes.

The activities of State Environmental Protection Agency (SEPA) and Federal Environmental Protection Agency (Now Ministry of Environment) should be widened in the study area and a system of collaboration and sharing of experiences among different bodies especially the environmentalists and the international bodies on sustainable flood management should be in place. Flood maps should be used for the reduction of damage potential by integrating its outputs into spatial planning and emergency planning

The construction of standard paved surface and drainages in the study area will help to combat flood hazard especially in the built up areas. The paved surface enables the run offs to move freely because it does not have the ability to retain water. Provision of adequate drainages is of paramount importance in road design and cannot be overemphasized. Culverts should be placed technically where necessary so that debris can pass freely through them to avoid blockage which may consequently results to overspill of water to the environment.

Levees represent one method of reducing the impacts of flooding on a community or a region. Levees keep the floodwaters away from the area behind the levee until the point at which the levee is overtopped or fails and the area behind the levees is inundated and the people and property are affected. The risk to those behind levees is a function of the characteristics of the levee (height, strength), their location, and the mitigation and risk transfer measures and vulnerability reduction actions that they have taken or have been taken on their behalf. As has been previously discussed, every location within a floodplain, regardless of the presence or absence of a levee and whether or not the levee is accredited, is subject to some level of risk.

Lastly there is need by the agency concerned for early warning and flood forecasting particularly in flood plain areas at immediate and high risk.

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