

Clustered Building Structures as Predictors of Environmental Pollution in Lagos Metropolitan City

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Abstract

Buildings are among the most important artifacts in the landscapes of the world, as they provide homes for people to live in, as well as carrying out other social activities. This study examined clustered building structures as predictors of environmental pollution in Lagos metropolitan city. Studies have been conducted on pollution generally but there is little of such studies on clustered building structures as it relates to environmental pollution. A descriptive survey research design was adopted to describe all the variables. While purposive sampling technique was employed to in choosing three hundred and seventy-two (372) residents as respondents. A revalidated questionnaire was used with a test-retest method yielding 0.82. Hypotheses were tested using *Chi-square* (X^2) at 0.05 level of significance. Results showed that there is significant difference between resident education and level of risk perception (knowledge and concerns) of environmental pollution ($p=0.017$, $p<0.05$). Also among others, there is significant difference between government policies and factors responsible for clustered building structures ($p=0.005$, $p<0.05$). Conclusively, there is need for a proper understanding of this linkage in order to effectively and efficiently develop programmers and strategies that will enhance the drive towards sustainable environmental management. It is recommended that, both government and the researchers should reinvigorate campaigns for the clustered buildings structured as a way of securing their long-time utility and preventing environmental pollutions and laws proscribing change of use of buildings should be enforced more strictly to prevent developers from putting buildings to use for which the buildings are not well-suited.

Keywords: Clustered building structures • Environmental pollution • Lagos metropolitan city • Predictors

Introduction

Background to the study

Buildings are among the most important artifacts in the landscapes of the world. They provide homes for people to live in and carry out other social activities. At the present state of civilization, life without buildings is unimaginable. Consequently, most nations of the world have clear policies for building provision to meet different needs, like accommodation, office spaces, educational and health facilities amongst others. Building construction enhances growth and development of a country, thereby providing shelter the second necessity of life for both the citizens and non-citizens.

It has been observed in recent times, that environment plays major roles which the global society development process cannot be relegated to the background. Apart from being the physical surrounding for natural habitats, the environment provides the basis for human

exploits for industrial, commercial, technological and tourism development of a society. For this and several other reasons, environmental issues now occupy a center stage in academic discourse and other policy making for both at national and international levels. Recorded evidence has also shown that the environment represents a wide range of external circumstances, conditions and the things that affect the existence and development of an individual, organism, group and society [1-5].



Figure 1. Idumota area of Lagos Island.

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Lagos being a coastal state located in a low lying area, as well as the largest state and the economic and financial capital of Nigeria with a teeming population, the state of Lagos faces very serious environmental challenges consistent with its physical location and economic stature. Confronting the Lagos area are recurrent ecological issues, such as the threats of heavy rainfall, flooding, pressures from overcrowding and the continual encroachment of rapid urban development activities into fragile natural areas to the detriment of ecosystem stability. The environment is threatened severely by most problems, some of which are caused by the activities of construction projects or clustered building structure. Lagos metropolitan city is one of the largest metropolitan cities in Nigeria and like many other upcoming urban areas, it is faced with a high rate of population growth. The increasing number of immigrants and investors to Lagos metropolitan city has led to high demand of space for businesses and accommodation. Consequently, a number of structures, residential, industrial and commercial have continued to spring up. Much as these activities are a sign of social and economic development, that have been carried out with disregard of environmental concerns which mainly focus on atmospheric emissions, environmental deterioration, depletion of natural resources and energy issues. The commencement of a building project which is the construction stage, to the final occupation of the buildings by the end users, certain building operations poses pollution threats to the environment. This indicates that the problems of pollution are obviously created by man as he tends to seemingly make the environment better for his habitation. This has posed a very serious challenge to those in the building, health and environmental industry, the government and the individuals who are into property development in the country and in Lagos state. The worrisome development and incidents throw the question that, what might be the cause(s) of clustered building structures in the state? Several factors have been associated with this, some of which are negligence, greed, deficient foundations, hasty construction, poor supervision and non-adherence to the building codes.

Contributing also to the clustered building structures is the lack of adequate monitoring of the continuous development by the building regulation authority and lack of proper documentation of the pattern of

growth as seen in most urban developments in developing countries. Clustered building has led to easy spread of diseases due to the poor conditions of living in those environments such as illegal way of waste disposal, lack of availability of clean water, lack of modern toilet systems and dirty environment. Most of the wastes collected by private firms and the public firms are not adequately treated before disposal which also contributes to the pollution of the environment. The drainage systems are blocked and cause different types of environmental pollution in all parts of the city. Poor air quality tends to increase asthma levels for children. This tend to put the future generation of the country in high risk of sickness which is great danger to the country as a whole and also incurring much medical challenges to the budget of the state.

Materials and Methods

Research design

The study adopted a descriptive survey research design. The study was conducted in Idumota, Lagos island using purposive sampling technique. The purposive sampling technique was employed to select three hundred and seventy-two respondents. The instrument used for data collection was a revalidated questionnaire with a test-retest method yielding 0.82. Twenty question items were generated in closed ended with a limited number of multiple choices on level of risk perception (knowledge and concern) of environmental pollution, types of environmental pollution that affect environments as a result of building structures, effect of environmental pollution on health of residents, factors responsible for clustered building structures, government policies on building structures. Items were reduced to a meaningful and manageable structure, using principal factor analysis with three major components for the validation of the instruments. At the end, the questions were subjected to exploratory factor analysis, setting the retention criterion at 0.70. Data were analyzed using descriptive statistics of frequency counts and percentage for demographics attributes of the respondents while *Chi-square* (X^2) statistical tool with the aid of Statistical Package for Social Science (SPSS) version 25 was used to test the hypotheses at 0.05 level of significance (Table 1).

S/N	Variables	Characteristics	Frequency	Percentage
1	Sex	Male	93	47.7
		Female	102	52.3
2	Age	16-25 years	31	15.9
		26-35 years	81	41.5
		36-45 years	49	25.1
		46 years and above	3	17.4
3	Marital status	Single	69	35.4
		Married	92	47.2
		Divorced	120	10.3
		Widow/Widower	14	7.2
4	Education status	Primary	22	11.3

		Secondary	72	36.9
		Tertiary	92	47.2
		None	9	4.6
5	Occupation	Trading	83	42.6
		Civil servant	42	21.5
		Clergy	5	2.6
		Teaching	7	3.6
		Student	20	10.3
		Other (specific)	38	19.5
6	Length of years in the environment	Below 1 years	10	5.1
		1-5 years	34	17.4
		6-10 years	59	30.3
		11-15 years	45	23.1
		Above 16 years	47	24.1
7	Religion	Christianity	72	36.9
		Islam	96	49.2
		Traditional	27	13.8
8	Ethnicity	Yoruba	78	40
		Igbo	57	29.2
		Hausa	29	14.9
		Others	31	15.9

Table 1. Demographic information.

The Table 1 above shows that 47.7% of the respondents were males while 52.3% of the respondents were females. 15.9% of the respondents were 16-25 year-old, 41.5% were 26-35 year-old, 25.1% were 36-45 year-old while 17.4% were 46 vs. year-olds and above. Also, 35.4% formed single part of the respondents, 47.2% were married, 10.3% were divorced while 7.2% were widow/widower. Furthermore, 11.3% of the respondents were primary school certificate holders, 36.9% were secondary school certificate holders, 47.2% were tertiary education holders while 4.6% had no former education. 42.6% of the respondents were traders, 21.5% were civil servants, 2.6% were clergy, 3.6% were teachers, 10.3% were students while 19.5% were into other occupations like engineering, fashion etc. 5.1% of the respondents had below 1 length of years in the

environment, 17.4% had 1-5 years, 30.3% had 6-10 years, 23.1% had 11-15 years while 24.1% had 16 length of years in the environment. 36.9% of the respondents were christianity, 49.2% were Islam while 13.8% were traditional worshipper. 40.0% of the respondents were Yoruba ethnicity, 29.2% Igbo, 14.9% were Hausa while 15.9% were from other ethnic group.

Results and Discussion

Hypothesis 1

There is no significant difference between resident education and level of risk perception (knowledge and concerns) of environmental pollution (Table 2).

Variables	Value	Df	Asymp. Sig. (2-sided)
Pearson <i>Chi-square</i>	40.880 ^a	24	0.017
Likelihood ratio	37.162	24	0.042
Linear-by-linear association	9.707	1	0.002
N of valid cases	195		

Note: ^a22 cells (61.1%) have expected count less than 5. The minimum expected count is .09

Table 2. *Chi-square* tests resident education and level of risk perception (knowledge and concerns) of environmental pollution.

The above results showed that, there is a significant difference between resident education and level of risk perception (knowledge and concerns) of environmental pollution [6-10].

The p-value of 40.88 is significant at 5% ($P < 0.05$). This implies that, there is a significant difference between resident education and level of risk perception (knowledge and concerns) of environmental pollution among the residents. This finding agreed with, that everyone

who is exposed to environmental pollution would be a benefit from educational programming to improve health.

Hypothesis 2

There is no significant difference between types of pollution and perceived health risk from pollution in the environment (Table 3).

Variables	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-square	47.118 ^a	35	0.083
Likelihood ratio	43.329	35	0.158
Linear-by-linear association	5.26	1	0.022
N of valid cases	195		

Note: ^a31 cells (64.6%) have expected count less than 5. The minimum expected count is .12

Table 3. Chi-square test between types of pollution and perceive health risk from pollution in the environment.

The above results showed that, there is no significant difference between types of pollution and perceived health risk from pollution in the environment.

The p-value is not significant at 5% ($P > 0.05$). This implies that, there is no significant difference between types of pollution and perceived health risk from pollution in the environment. This finding contradict study that perceived air pollution and health risk perception

may play important roles in eliciting health symptoms and potentially contribute to disease.

Hypothesis 3

There is no significant difference between gender and level of perceived risk and action in response to environmental pollution (Table 4).

Variables	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	8.547 ^a	8	0.382
Likelihood ratio	9.524	8	0.3
Linear-by-linear association	0.36	1	0.548
N of valid cases	195		

Note: ^a4 cells (22.2%) have expected count less than 5. The minimum expected count is .95

Table 4. Chi-square tests between gender and level of perceived risk and action in response to environmental pollution.

The above results showed that there is no significant difference between gender and level of perceived risk and action in response to environmental pollution.

The p-value is significant at 5% ($P > 0.05$). The indicates that gender and level of perceived risk and action has no impact in environmental pollution.

Hypothesis 4

There is no significant difference between government policies or laws and factors responsible for clustered building structures (Table 5).

Variables	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-square	46.648 ^a	25	0.005
Likelihood ratio	41.905	25	0.018

Linear-by-linear association	12.435	1	0
N of valid cases	195		
Note: ^a 21 cells (58.3%) have expected count less than 5. The minimum expected count is .21			

Table 5. *Chi-square* tests between government policies or laws and factors responsible for clustered building structures.

The above results showed that, there is significant difference between government policies and factors responsible for clustered building structures.

The p-value is significant at 5% ($P < 0.05$). This implies that government policies have great influence on clustered building structures if adhered.

Variables	Value	Df	Asymp. Sig. (2-sided)
Pearson <i>Chi-square</i>	45.250 ^a	25	0.008
Likelihood ratio	46.609	25	0.005
Linear-by-linear association	11.318	1	0.001
N of valid cases	195		
Note: ^a 21 cells (58.3%) have expected count less than 5. The minimum expected count is .16			

Table 6. *Chi-square* tests between health effect of environmental pollution and factors responsible for clustered building structures.

The above results showed that, there is significant difference between health effect of environmental pollution and factors responsible for clustered building structures.

The p-value is significant at 5% ($P < 0.05$). This implies that, there is significant difference between health effect of environmental pollution and factors responsible for clustered building structures. This was in agreement with the U.K Green Building Council (2011), that cluster building structure contributes to 23% of air pollution and 50% landfill waste.

Conclusion

The study concluded that there exist unorganized causes of clustered building structures in Nigeria, particularly at Idumota, Lagos Island, Lagos identified by various authors as predictors of environmental pollution. No serious attempts were made to statistically categorize the causes of clustered building structures in Idumota, Lagos Island, to aid decision making for policy formulation.

Recommendations

The study, therefore, recommended that Both government and the researchers should reinvigorate campaigns for the clustered buildings structured as a way of securing their long-time utility and preventing environmental pollution, laws proscribing change of use of buildings should be enforced more strictly to prevent developers from putting buildings to use for which the buildings are not well-suited, from markets to the sites, governments should strengthen measures to prevent substandard construction of buildings and materials that are health hazards should be properly disposed of to prevent environmental pollution.

Hypothesis 5

There is no significant difference between health effect of environmental pollution and factors responsible for clustered building structures (Table 6).

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