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EXAMINATION OF STATE OF REPAIR OF BUILDINGS IN PRIVATE HOUSING ESTATES IN ENUGU METROPOLIS, ENUGU STATE NIGERIA

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ABSTRACT
The private sector in housing provision continually take steps towards addressing part of the problem of cushioning the effect of housing shortage in Nigeria by establishing housing estates since government alone cannot provide housing for everyone. This research examined and reported findings from a research conducted on the state of repair of buildings in private housing estates in Enugu metropolis, Enugu state Nigeria. The objectives of the study were to: examine the physical conditions of the building fabrics and appraise the performance of infrastructural services provided in the buildings. Questionnaire was used as research instrument to elicit data from respondents. Stratified sampling of the estates based on building type was adopted as sampling method for this study.Findings from the research show that the state of repair of most buildings require minor repairs to make them fit for habitation and sound to ensure well-being of the residents. In addition, four independent variables from the nine independent variables investigated, significantly explained residual variation in the dependent variable - state of repair of the buildings in the study area. These variables are: Average Monthly Income of Residents *(AMIR),* Length of Stay of the Residents in the estates *(LSY), Type* of Wall Finishes on the buildings *(TWF) and Time Taken to* Respond to Resident's complaints by the estate managers *(TTRC).* With this, linear model was established for predicting the state of repair of buildings in private housing estates in the study area. This would assist in identifying variables that are lucid in predicting state of repair of the buildings.
Keywords: Building, housing estate, private, repair, state

INTRODUCTION
The state of repair of buildings is a vital determining factor of the habitability of buildings as this exposes the resident's level of satisfaction, well-being and safety. Coker, Awokola, Olomolaiye, and Booth (2007) noted that there is link between state of repair of buildings and housing quality which equally indicates the quality of life of the residents. The deterioration in the state of buildings especially in city centers in Nigeria can be attributed to effects of urbanization (Olotuah,2006). Rural-urban migration has

been partly the reason for rapid level of urbanization which has consequently led to appalling conditions of the housing environment in the city centers. Previous researches (Diogu, 2002; Andersen, 2008; Aotearoa, 2009) have revealed that this has put forth pressure on housing stockexisting in the cities as well as basic infrastructure.

Onibokun (1985) as cited in Ibem (2011) noted that state of repair of buildings comprises a number of variables such as: the buildings, adequacy of internal spaces within the housing units and amenities, number of occupants, among others. In addition to these variables, UN-HABITAT (2006) further included: resilience of construction materials used in the building, secured house tenure ship, structural stability, availability of basic infrastructural services (e.g. potable water supply, proper sewage disposal system and steady electricity supply)in a location that has good link with other parts of the city. In Nigeria, there is serious housing shortage particularly in the city centres, as government and the private sector have been unable to meet the housing needs of the populace. Though, the private sector over the years has provided bulk of the housing stock in the country. Olotuah (2016) as cited in Umeora (2018) noted that the great percentage of the housing stock (housing estates inclusive) in Nigeria is largely inadequate qualitatively vis-à-vis state of repair of the buildings.

The appalling state of repair of buildings in some housing estates in Enugu Nigeria is revealed in the preponderance of structurally unsound buildings. Therefore, state of repair of buildings can be considered to consist of attributes of buildings that enable it accomplish the functions of promoting healthy living conditions as well as psychological wellbeing of the residents. The objectives of the study are to: examine the physical conditions of the building fabrics and appraise the performance of infrastructural services provided in the buildings.

METHODOLOGY

This study reported is on a research conducted on private housing studies in Enugu metropolis, Enugu State Nigeria built from 1991-2016. Primary data used for this study were obtained in a field survey conducted in the study area, the research

instrument used were questionnaire and observation schedule, designed to elicit data on building matters relevant to this study. The questionnaire was written in English Languageand were administered by author with the help of three research assistants who were tutored on the techniques for the exercise. A copy of questionnaire was administered to household heads (as respondent) in a building as most of the variables measure the physical characteristics of the buildings. The questionnaires were retrieved immediately after completion and collated for analysis.Stratified sampling of the estates based on building type was adopted as sampling method for this study. The stratification of the estates are: 1-bedroom and 2-bedroom bungalows combined, 2-bedroom blocks of flats and 3-bedroom blocks of flats combined, 1-bedroom, 2-bedroom and 3-bedroom bungalows combined. Table 1 describes the categorization based on the criterion stated above:

Table 1: List of Private estates in Enugu metropolis stratified by housing type as it exists in the estates

S/N	1-bedroom and 2-bedroom bungalows combined	1-bedroom, 2-bedroom and 3-bedroom bungalows combined	1-bedroom and 2-bedroom flats	2-bedroom and 3-bedroom flats combined
1	Nwannedinamba estate	Goshen estate	Elim estate	COSCO estate
2		Bethel estate		Refiners Estate
3		Elim estate		Central Bank quarters
4				Elim estate

Source: (Field work 2018; Obodoh, 2009; Copen Group, 2014)

Following the stratification, random sampling by balloting was done and the following estates were picked to represent the different building types:

1. 1-bedroom and 2-bedroom bungalows combined:- Nwannedinamba estate
2. 1-bedroom, 2-bedroom and 3-bedroom bungalows combined:- Bethel estate and Elim estate
3. 1-bedroom and 2-bedroom terrace flats:- Elim estate
4. 2-bedroom and 3-bedroom flats combined:- Central Bank quarters

The total housing unit was 766 housing units. To obtain sample size from this finite population, the Cochran formula was used as adopted from Kothari, (2004). This gave a respondent size of 256 housing units. The obtained respondents' size was then distributed across the sample population in the ratio of their contribution to the research population as shown in Table 2.

Table 2: Numbers of housing units in sampled estates

Number	Nwanne D.N.M	Bethel	Elim	CBN quarters	TOTAL
Existing	50	131	324	261	766
Sampled	17	44	108	87	256

Field work (2018)

The univarite analysis done includes frequency distribution and descriptive summary measures were calculated for each of the variables under investigation. Ordinary Least Square regression analysis was also conducted on the research data using Statistical Package for Social Sciences (SPSS).

FINDINGS OF THE RESEARCH

The data obtained show that 66.5% of buildings in the study area block of flats. These were mainly concentrated at CBN quarters while the others were bungalows as shown in Table 3

Table 3: Data on building type

Value label	Valid Percent	Cumulative Percent
Bungalow	33.5	33.5
Block of Flats	66.5	100.0
Total	100.0	

Field work (2018)

In the survey as reported in Table 4, the state of repair of buildings was investigated. The buildings that were dilapidated were less than 1% as they were buildings with severe cracks on walls, broken facsia or failed or leaking roofs. These were considered unfit for human habitation. 7.6% of the buildings in the sample required that major repairs are needed to bring the

buildings to a state of structural quality as these were equally unsafe for habitation. More than half of the buildings sampled (58.9%) required minor repairs, while up to one third the remaining buildings (32.6%) were good enough for human habitation to be regarded as sound.

Table 4: Data on state of repair of buildings

Value label	Valid Percent	Cumulative Percent
Dilapidated	.9	.9
Requires major repairs	7.6	8.5
Requires minor repairs	58.9	67.4
Sound	32.6	100.0
Total	100.0	

Source: Fieldwork, 2018

The research data got indicated that more than one third of residents (82.9%) are tenants and only 17.1% of the population was owner-occupiers. Majority of residents are tenants who pay rents annually while those on lease hold constitute only 1.7% as shown in Table 5.

Table 5 Data on house tenure type of respondents

Value label	Valid Percent	Cumulative Percent
Monthly tenancy	6.8	6.8
Annual tenancy	74.4	81.2
Lease hold	1.7	82.9
Owner occupier	17.1	100.0
Total	100.0	

Source: Fieldwork, 2018

Majority of the respondents indicated that the paints on the walls are peeling. This implies that greater proportion of the buildings have the paints peeling. This is demonstrated in Table 6.

Table 6: Data on peeling paints walls

Value label	Valid Percent	Cumulative Percent
Yes	55.5	55.5
No	44.5	100.0
Total	100.0	

Source: Fieldwork, 2018

The outcomes from the analysis on broken tiles on the walls showed that 60.2% of the respondents reported that there are no broken tiles on the walls of the building, as shown in Table 4.66 and Figure 7.

Table 7: Aggregated data on broken tiles on walls

Value label	Valid Percent	Cumulative Percent
Yes	39.8	39.8
No	60.2	100.0
Total	100.0	

Source: Fieldwork, 2018

Most of the buildings in the study area have public power supply as the main source of electricity. The data electricity supply indicated that bulk of residents pointed that there is 12 hours of electricity per day in the study area, though some residents indicated that there is less than 6hours of supply per day (Table 8).

Table 8: Data on main source of electricity supply

Value label	Valid Percent	Cumulative Percent
Public power supply	100.0	100.0
Solar panels	0.0	100.0
Personal power generating set	0.0	100.0
Total	100.0	

Source: Fieldwork, 2018

Most buildings (47%) in the study area relied on hand-dug wells for water supply. These wells habitually dry up for the duration of the dry season and were only reliable for supply only during the rainy season. More than half of the population (51.3%) obtained water from water vendors, while less than 1% depend on water from public mains as shown in Table 9.

Table 4: 1: Aggregated data on mode of water supply

Value label	Valid Percent	Cumulative Percent
Public water supply	.9	.9
Well inside the compound	47.0	47.9
Private borehole	.8	48.7
Water vendors	51.3	100.0
Total	100.0	

Source: Fieldwork, 2018

For the Ordinary Least Square regression analysis, the impact of the variables that independently and jointly predict the state of repair of the buildings (as the dependent variable) was investigated. These independent variables were regressed against the dependent variable.

	Variables	Code	Values	Categories
V1	Average monthly income	AMIR	1-4	1. Below N15, 000 2. N15, 000 – N39, 999 3. N40, 000 – N69, 999 4. N70, 000-N99, 999 4. N100,00 and above
V2	Tenure status of residents	TSR	1-4	1. Monthly tenancy 2.Annual tenancy 3. Lease hold 4. Owner occupier
V3	Length of Stay	LSY	1-5	1. Less than 1 year 2. 2 years 3. 3 years 4. 5 years and above
V4	Type of building material used	TFU	1-5	1. Sandcrete blocks 2. Bricks 3. Concrete 4. Timber 5. Others
V5	Type of Wall finishes	TWF	1-4	1. Painted 2.Tiles/marbles 3. Plaster only 4. Others
V6	Main source of power supply	PWS	1-5	1. Public power supply 2. Solar panels 3. Personal power generating set 4.

				None 5. Others (specify)
V7	Mode of water supply	MWS	1-4	1. Public water supply 2. Well inside the compound 3. Borehole within the estate 4. Private borehole 5. Water vendors
V8	Mode of waste water evacuation	MWWE	1-3	1. No drains 2. Drains 3. Soak away pits
V9	Time taken to respond to residents' complaints	TTRC	1-5	1. 1day 2. 2days 3. 3days 4. 4days 5. More than 4days

These nine variables were entered on forced entry as independent variables. The coefficient of determination (R^2) of the model was 0.546 indicating that the independent variables collectively explain 54.6% of the residual variations in the dependent variable. Though only four of the independent variables namely - *AMIR, LSY, TWF, TTRC* showed significant impact in explaining the residual variation in the dependent variable. To get the equation of best regression, the step-wise algorithm was done with the variables entered according to the individual's contribution to the model. The analysis of variance indicated that in each step of the model, the influence of each of the variables was significant with an increase in the coefficient of determination and decrease in the standard error of the estimate. The four variables in the model are consequently the predictor or explanatory variables for the State Of Repair of the Buildings. The regression coefficients results indicated that at the last step of entry, the regression estimates for the dependent variable are: $\beta AMIR = .483$, $\beta LSY = 0.414$, $\beta TWF = 0.317$, $\beta TTRC = 0.244$

To get a quantitative equation for predicting the dependent variable, the least square algorithm was applied to the model:
$Y = \beta_O + (\beta AMIR \times AMIR) + (\beta LSY \times LSY + (\beta TWF \times TWF) + (\beta TTRC \times TTRC + E$ $Y = 1.921 + .483AMIR + 0.414LSY + 0.317TWF + 0.244TTRC$

The above was the quantitative equation for predicting the dependent variable State Of Repair of the Buildings. The implication of this is that if quantitative values were given to each of the independent variables, the resultant value for State of repair of the buildings in the estate could be predicted. Therefore,

this offers a basis for addressing this variable through the investigation of its predictive variables.

RECOMMENDATIONS

These recommendations are put forward: structural stability and conditions of some of the buildings investigated were in a poor state and are unsafe for habitation. The authorities of government in charge of building inspection should show more commitment in ensuring that private housing developers or managers should visit the estates regularly to have feedback on the state of repair buildings in order to improve the standard of living of the residents. Some of the buildings sampled in the study area were lacking in the provision of infrastructural amenities – electricity and potable water supply, which make the buildings to be in habitable condition. The lack of adequate and potable water supply sometimes put the buildings in unhygienic conditions making the buildings unfit as this poses a threat to the lives of the residents. To prevent more buildings from falling to a state of disrepair which could lead shortages in housing stock in the study area and to prevent slum formation government should provide an enabling environment for the private sector to surmount the challenges that face them.

CONCLUSION

In conclusion, most of the buildings in the private housing estates require minor repairs. Repair works should be carried out on them to prevent the buildings from dilapidating. Also, efforts should be made of private housing estate developers to make sure that provision is made for adequate water supply in the estates. Equally, considerations on the type of material to be used as wall finishes should be made bearing in mind the status of intended residents. Though, residents may want their buildings to reflect their personality, it must be realized that the buildings whose appropriate relation to other variables is of key importance to the estates functioning properly.

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