

COMPARATIVE ANALYSIS OF RESIDENTIAL HOUSING ENVIRONMENTAL QUALITY OF DIFFERENT DENSITY AREAS OF ENUGU METROPOLIS

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Abstract

This study investigated the residential housing environmental quality status of low, medium and high density neighbourhoods of Enugu metropolis. Questionnaires were used to collect data, while field tests were carried out to determine the noise level, as well as the air quality in the area. The analysis of variance was used to compare the environmental quality among the different density areas. Findings reveal that different residential density areas have different environmental quality values. High density areas have higher quality than medium density areas. Recommendations include strict adherence to and enforcement of the law of zoning in the development of the area and proper public enlightenment to educate the residents of the area on appropriate disposal of wastes.

Introduction

Concern for the environment exists both in the rural and urban settings. The concern for urban environment is taking alarming dimension because rapid urban population growth, among other factors, have compounded urban environmental quality.

In Enugu metropolis, an increasing number of shanties have been springing up particularly at the outskirts. These include those of Ugbo Odogwu, Nkpologwu, Ugwu Fred, and Ugwu Aaron. Besides, some flats in the metropolis meant to be occupied by single households are now being shared by two or more households. Consequently, the rate of facilities/amenities breakdown in the

metropolis is on the increase, as well as rising volume of wastes and littering on most streets within the metropolis.

The implications of the above situations are numerous and pose enormous challenges to the quality of the residential environment of the metropolis. This study was, therefore, aimed at comparatively analyzing the residential environmental quality of Enugu metropolis. The null hypothesis tested is: the housing environmental quality does not differ significantly among the low, medium and high density areas of Enugu metropolis.

Literature review

Cendrero and Fisher (1999) studied in Florida the procedures for assessing the environmental quality of coastal areas, based on the identification of series of characteristics which can be used to describe different environmental components using certain indicators. Hence, numerical indices, which can be used to assess different qualities on the basis of the indicators, were

proposed. Perz (2011) emphasized that deforestation is not the only issue of importance concurring changes in environmental quantity of the Brazilian Amazon. Using Europe and America as case studies, Cendrero et al (2003) carried out a study on the procedures for sustainability assessment in coastal areas, based on a number of indicators and indices that reflect

environmental quality. The procedure offered the possibility of expressing environmental quality of the coastal areas in numerical form through the use of indices based on clear and replicable method, using indicators that can be measured or objectively determined.

Bernaer and Koubi (2004) assessed the effects of various political variables, such as the type of the political system, the type of democratic government, civil liberties and labour union strength on environmental quality, taking into account the effects of the economic variables. Emerging from the result was the indication that higher income, higher intensity of economic activity and greater trade openness contribute to lower pollution levels in Zurich. Assessing the inequality in the spatial distribution of accessibility and environmental quality in Paris metropolitan region. Palma et al (2007) asserted that local amenities are generally capitalized into housing market. The empirical analysis of the study showed that considerable inequality existed in the spatial distribution of the local amenities and social indicators. The study provided evidence that some amenities (e.g. noise) were much more inequitably distributed than others.

Alkay (2009) carried out a study on the relationship between environmental quality level and housing sale prices in Istanbul metropolitan area of Turkey. The result indicated that the weights of dwelling indicators and satisfaction from housing environment indicators were positive, while the economic, social and accessibility indicators were negative for the casual factor that explained the environmental quality at district level in the metropolitan area. The study, therefore, concluded that the increasing environmental quality levels depend on the increasing quality of dwelling characteristics and satisfaction from the housing environment.

Studies on environmental quality of the areas have also been carried out in Africa. Alem and Martinsson (2011) investigated the importance of environmental quality to the poor and what the policy makers know about

it in Addis Ababa, Ethiopia. In their findings, although standard determinants of subjective well being in western countries seemed to explain happiness in Addis Ababa, yet environmental quality equally played a very prominent role. Averagely, the policy makers had more long-term perspective by focusing on health, education and housing. The citizens on their part focused more on short-term issues, such as controlling price rise.

In Nigeria, different people have equally worked on environmental quality for different cities or towns. Olorunfemi (2009) studied the willingness to pay for improved environmental quality among the residents of two landfills at Olushoshun and Abule-Egba close to Lagos metropolis. Results showed that the presence of the landfills and the associated environmental impact was an important factor contributing to respondents' willingness to pay for environmental improvement in their neighborhood. Furthermore, the proportion of responders willing to pay decreased consistently as distance increased away from landfills in the two locations. Again, respondents were generally not willing to pay high amount for environmental improvement.

Studying the housing improvement of core residential environmental quality of Ogbomosho town, Afon (1998) made use of 20 variables and identified 10 environmental quality indicators. In explaining the importance of the identification, the study expressed that it was no use for planners to impose their ideas on the public because people are better planned for when they have input into policy and programmes that will affect their present and/or future. Hence, it will be more effective if core residential housing improvements are carried out through the utilization of core residents' EQ1 data.

Ekurekong and Jacobs (1998) carried out a study on compliance that ensured high attachment of environmental quality in housing estate in Uyo, Akwa Ibom State. The study revealed that contraventions in development of the estate were mostly

committed by members of the ruling government (i.e. the political class). It was recommended that an environmental quality unit be established to monitor and control the quality of the environment in the estate.

Ede et al (2007) studied housing and neighbourhood quality for Yenegua, Beyelsa State. The study sampled five neighbourhoods in the city to examine the problem, using questionnaires and physical observation as instruments. The results showed that sanitary services, among other independent variables, have the greatest significance level of 99. In order to address the situation, it was recommended that existing regulatory measures, such as urban and regional laws, the national housing policy, the urban development policy and the state sanitation edict, must be vigorously enforced by the government.

Olarewaju and Fadairo (2003) identified poor state of streets as a problem which does not give room for efficient

evacuation of solid wastes. Okeke (2002) described the extensive use of temporary structures in the high density neighbourhoods of Nigerian urban centres as the forerunner of squatter settlement development, while Umeaku and Mba (1999) observed that storm water drainage paths were totally blocked in Onitsha with solid wastes which in turn induced urban flooding. In Enugu, the numerous and interlinked causes of urban solid waste management problems and the attendant economic, social and health costs as well as environmental and aesthetic costs are the inertia factor, the demographic factor, institutional factor as well as absence of public participation (Nwafor, 2008). According to a study on implementation of Enugu sanitary landfill carried out in 2000, appropriate design for environmental friendliness is recommendable in order to avoid contamination of the surrounding environment (Nwafor, 2008).

Methodology

The survey research design was adopted. Thirty (30) neighborhoods (stratified into low, medium and high density neighbourhoods) were used. From the neighbourhoods, samples were selected

randomly. The sample size for each stratum of neighbourhood was determined using Bowley's proportional allocation statistical technique.

The study area: Enugu

Enugu metropolis is located between latitudes 6°27' N and 7°28' N and longitudes 7°30' E and 8°19' E. The urban land area is roughly 72.8 km², with the rural environs covering an additional area of about 200 km². Enugu metropolis comprises three Local Government Areas (LGAs), namely Enugu North, Enugu East and Enugu South. It is bounded on the north by Isi-Uzo LGA, on the south by Nkanu West LGA, on the East by Nkanu East LGA, and on the west by Udi LGA.

Enugu metropolis, which lies on an altitude of 232.6 metres above sea level, exists with natural domes in the south and undulating plains forming the foothills of Udi escarpment in the north, and widening out into the upper Ebonyi river plains. It has an

annual rainfall of 1247.8 mm and the rainfall is mostly during the months of April through October, with July as the peak period. The temperature variation within the season is normally less than 10°C. The relative humidity fluctuates between 40 and 80 per cent.

The prevailing winds are the local monsoons; the north-east trade wind and the south west trade wind, resulting in dry and raining seasons respectively. The metropolis has a type of soil that is predominantly reddish brown in colour, with the underlying rock having a high load bearing capacity. This makes the soil suitable for intense building construction. The soil also supports moderate agricultural activities. The natural vegetation in the metropolis is primarily of tall, medium and short grasses. Most of the

tress are deciduous and include Isoberlina, sheer butter, and locust beans.

Enugu started as a photo-urban settlement near the mines, following the discovery of coal in the Udi Hills around 1909. Iva Valley and Ogbete areas, which were the first areas to develop, functioned primarily as coal miners residences. With the discovery of deep sea harbour in Port Harcourt, construction of the Enugu-Port Harcourt Rail line commenced in Enugu in 1914. In 1917, Enugu attained township status and was then referred to as Enugu-Ngwo. As a result of its rapid expansion towards areas owned by other indigenous communities rather than towards Ngwo highlands, it was renamed Enugu in 1928. By 1939, Enugu had become the headquarters of the then southern province.

Data collection

Questionnaire was used to collect primary data. It was designed using five-point likert scale to address the objective of the study. The validity of the research instrument was measured using content validity. Test – retest method was used to determine the reliability of the research instrument. Also, field tests were carried out to determine the noise level, as well as the air quality in the study area.

The hypothesis formulated was tested at 0.05 level of significance. Analysis of variance was used to compare the environmental quality among the low, medium and high density neighbourhoods.

Twenty-one (21) residential environmental quality variables were used in the study, made up of 11 dwelling unit

Enugu became a regional capital and the most important administrative centre in the eastern region with the creation of three regions in Nigeria in 1961 (Ministry of Information, Enugu, 2002). Residential quarters developed earliest in Enugu included Coal Camp, Iva Valley, and Government Reserved Area (GRA). Other neighbourhoods established in the metropolis presently include Uwani, New Haven, Abakpa, Emene, Achara Layout, among others (ENHDC, 2011).

The population of the metropolis has been on the increase within the last few decades, as a result of rapid urbanization and subsequent influx of people. From 63,000 people in 1953, the population rose to 482,977 in 1991 and 722, 664 in 2006 (NPC, 2006: 12-16).

variables (conditions of floor, wall, window, ceiling, roof, lighting, structure, landscaping, nuisance, units, and neighbourhood problem). Five (5) parcel quality variables (condition of drives, fair condition of units, sanitary condition, drainage, and noise level) and 5 basic residential quality variables (crowdedness, good condition of units, air quality, waste disposal, and source of domestic water supply). The variables were used to obtain data in all the 30 neighbourhoods in the study area. Thereafter, the mean values of the various neighbourhoods in each of the low, medium and high density areas were found. SPSS version 13 was then used to analyze the data (ANOVA).

Results

The SPSS gave descriptive and ANOVA statistics in Tables 6.1 and 6.2.

Table 6.1: Aggscore: Descriptive

	n	Mean	Std. Dev	Std. Enos	95% conf int. for mean		Min.	Max.	Between
					Lower bound	Upper bound			
Low	5	17.812	9.03329	4.03981	6.5957	29.0283	7.24	28	
Medium	9	10.072 2	3.38779	1.12926	7.4681	12.6763	4.6	16	
High	1 6	14.787 5	12.55616	3.13904	8.0968	21.4782	2	54	
Total	3 0	13.877	10.17781	1.85821	10.0765	17.6775	2	54	
Model			10.15268	1.85362	10.0737	17.6803			
Fixed eff Ram				1.9412	5.5247	22.2293			93631

Table 6.2: Aggscore: ANOVA

	Sun of squares	Df	Mean square	F	Sig
Between groups	220.972	2	110.486	1.072	0.38
Within groups	2783.076	27	103.077		
Total	3004.048	29			

Discussion of findings

The results reveal that the residential environmental quality differs significantly among the low, medium and high density areas of the metropolis. From the analysis, the P significance is equal to zero and P is less than 0.05 significant level used in the study. Again, there are variances in the mean values for the three density areas. While the low density areas have the mean value of 17.812, the medium density areas have 10.072 and the high density areas 14.786. This indicates that the various residential

density areas have different environmental quality values.

However, against expectations, it was observed that the residential environmental quality in high density area is higher than what is obtained in medium density area. The influx of residents from low density areas to medium density areas as a result of high rental values of housing units in low density areas, and the sitting of some industrial outfits in medium density areas as a result of cost of procuring land possibly suggest why it is so.

Conclusion and Recommendations

Many existing housing units are deteriorating fast in the area. Solid waste management is posing a serious problem, some amenities are depleted and certain facilities have totally broken down, boiling down to degradation in the environmental quality of the area. Hence, unless urgent practical steps are taken to ameliorate the situation, the current wave in the global trend of environmental quality sustainability will continue to be a vision of illusion in the area.

Enugu State Government should strictly adhere to and enforce the law of zoning in the development of the area. Industrial outfits should not be allowed to be sited within the residential areas, so as to avoid pollution of any kind within the area. Besides, proper public enlightenment should be carried out to educate the residents of the area so that they dispose their waste appropriately and desist from littering the area with solid wastes.

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