Effect of Environmental Quality on Property Rental Values in Peri-urban Neighbourhoods of Minna, Nigeria

[1]N. I. Popoola, [2]M. A. Jinadu, [1]H. S. Liman and [2]N. T. A. Abd'Razack

[1]Department of Estate Management and Valuation,
School of Environmental Technology,
Federal University of Technology, Minna, Nigeria.

[2]Department of Urban and Regional Planning,
School of Environmental Technology,
Federal University of Technology Minna, Nigeria.

Abstract

The study examined the effect of environmental quality on rental values of residential accommodation at the peripheral neighbourhoods of Minna, Nigeria. Cluster sampling method was employed in the selection of sampled areas and, six neighbourhoods were randomly selected. Sample size of 600 was drawn out of the total 18,387 households in the sampled neighbourhoods using Adams *et al.* (2007) simplified formula. Estimation rate of 50% and precision range of ±4 were adopted in determining the sample size. Various houses and infrastructure attributes were used in assessing environmental quality, while current rent passing in the year of study was adopted. Pearson moment correlation coefficient was employed in assessing the relationships between environmental quality and rents using environmental indices and mean rents. Results revealed a moderate linear relationship between environmental quality and rents in the neighbourhoods ($r= 0.48$, $N= 591$, $p= 0.000$). The coefficient of determination ($r^2 = 0.23$), implied that only about 23% variation in rents in the selected peri-urban neighbourhoods can be attributed to environmental quality factors; other variations in rents are explainable by other factors relating to physical, legal and locational attributes of individual building. The implication is that, developers invested in location that promised them optimum returns over a period of time without much consideration to the quality of the environment. The study recommends routine housing maintenance, infrastructure provision and refurbishment for the achievement of qualitative and sustainable environment.

Keywords: environmental quality, rental value, peri-urban neighbourhood.

1.0 Background of the Study

It had been established through research that environmental quality plays crucial role in the determination of real property values; especially in housing price determination. Minna peri-urban areas lack adequate infrastructure in terms of quality and quantity to support the increasing development in the areas.

The development of a peri-urban area is an inevitable consequence of urbanization. As cities grow, the peri-urban area moves outward in waves (Nottingham & Liverpool University, 1998; Adell, 1999). As a result, the boundaries between rural and urban areas are gradually phasing out due to rapid urban population growth and expansion of the built-up areas (Simon *et al.*, 2004). There is no more visible clear cut lines as to where urban area stops and where rural starts. Jones & Visaria (1997) equally maintained that the boundaries between urban and rural areas are getting blurred, a condition common to both developing and developed nations of the world. The benefits and bane of city growth extends far into the urban fringe. Organization for Economic Cooperation and Development (OECD, 1979) observed that, the impacts of economic and physical growth of the urban area are not only limited to the urban boundaries; but reach far into much wider areas around the urban centres known as urban fringe areas or peri-urban areas.

Peri-urban areas are characterized by high, and often increasing population density, small land holdings, rich countryside homes, poor slums, diverse sources of income, a lack of regulation, contested land tenure rights, uncoordinated conversion of farmland to housing, pollution, environmental problems, intensified resource exploitation, considerable economic dynamism and a severe lack of service provision (Friedberg 2001; Simon *et al,* 2003; Briggs 1991). The resultant impact of these problems is evidenced more on the quality of houses and infrastructure in the areas in which majority of the inhabitants are low-income earners. McGee (1997) noted that one of the environmental and social challenges of the century will be the rapid and sustained increase of population expected in the fringe of the extended metropolitan regions of the developing world, where the city is expanding and industrial activity being relocated.

Environment in the general term refers to every living and non-living things in a particular habitat. It includes land, air, water, plants and animals, buildings and other infrastructure, and all of the natural resources that provide basic needs and opportunities for social and economic development of man (Social Report, 2003). Rapoport in Omar (1993) maintained that environmental quality deals with the physical environment as well as the perceived environment and defined as the material aspects of the physical which have certain effects on people. Environment in the context of this study is confined to the physical component of the environment, that is, the built environment which is basically everything that is humanly created, modified, arranged or maintained (Choudhary & Adane, 2012) and such includes houses and infrastructure supporting the houses. Rent is a periodic payment made by a tenant for the use

of a property of another person known as the landlord (Adegoke, 2005). Value of real estate is a function of physical, locational and legal characteristics of the property (Ling & Archer, 2006), influenced by increase or decrease in population, change in age distribution of population, change in taste and fashion, change in technology, change in building methods, change in building cost, inflation and deflation, change in culture and planning control, institutional factor, location and complementary uses (Millington, 1979; Oyebanji, 2003).

Related studies (Jim & Chen, 2006; Chun-Chang *et al.*, 2013) have attributed increase in property values to improvement in environmental quality. However, with the present deplorable conditions of most neighbourhood infrastructure as evidenced in poor roads, broken water pipes and blocked drainages amongst others in Minna peri-urban areas; it is expedient to examine the effect of such environmental condition on rents within the areas. Findings of study will help relevant environmental management agencies in decision making for the attainment of a sustainable environment.

2.0 Environmental Quality and Real Property Value

Empirical studies have attributed increase in property values to improvement in environmental quality. Presence of infrastructures such as water, electricity, adequate waste disposal system, sewage, roads and drainages amongst others has great influence on the quality of the environment. Jim & Chen (2006) observed that key environmental factors influencing housing prices in China are presence of green spaces and proximity to water bodies. Similar study in Taiwan by Chun-Chang *et al.* (2013) revealed that in-house environment, security, environmental quality, sports and leisure, have more impact on residential satisfaction within the area. As such, household will be willing to pay more for property in the area where they can best obtain maximum satisfaction. Chang & Lin (2011) adopted a hierarchical linear modelling approach to establish the relationship between neighbourhood characteristics and house price in Taipei, Taiwan. Findings from the study indicate that apart from other physical characteristics, neighbourhood attributes particularly the quality of the environment and the availability of sports and leisure facilities have the most significant impact on house prices in the study area.

Residential property values could also be enhanced by the presence of tree shades in a neighbourhood, which may give rise to certain benefits to those residing in the property including additional privacy and aesthetics (Bello & Yacim, 2014). Islam (2012) examined a set of neighbourhood characteristics to determine how they influence house prices in the city of Edmonton, Alberta, Canada. It was found that among the several variables tested, the level of household income and adjacency to ravines are the most significant variables that influence house prices positively. It was noted that although crime rate has a negative impact on house price, the impact is negligible.

A study by Hite *et al*. (2001) analyzed a combination of some structural, locational

and neighbourhood attributes' effect on property values as well as property taxes. The study paid special attention to some environmental dis-amenities especially the presence of landfills close to residential properties. The results show that proximity to landfills has more significant negative effect on property values than on property taxes. It also suggests that closing landfills will not necessarily eliminate property-value impacts. In other words, both open and closed landfills will exert negative impact on property values.

Related studies in Nigeria revealed that accessibility, rent, transport improvement, quality of neighbourhood, infrastructural facilities and government regulations are factors influencing land value in Lagos Metropolis (Olayiwola *et al,* 2005). Olayinka *et al*. (2013) observed that proximity to the major transport route, number and size of bedrooms, conveniences, good access roads and drainages and security are the major factors affecting property values within Magodo neighbourhood in Lagos State. Similarly, Oduwaye (2009) maintained that cost of land has direct bearing on the quality of development in any neighbourhood. The researcher observed that residential land values are high in the low density areas and lower at the high density areas of Lagos state. Famuyiwa & Otegbulu (2012) attributed increase in property rental values to availability of water infrastructure within a neighbourhood. A study by Akinjare et al. (2011) also revealed that property values rise with increasing distance from landfills while property located close to the landfills experienced reduction in value in Lagos State.

However, Udoka (2013) identified curb appeal (first thought that people have as they are driving by a property), neighbourhood quality, presence of infrastructural facilities and the economic situation in a place as major factors influencing property value. Again, accessibility was identified by Alimi et al. (2014) as major factor influencing what household will pay as rent in a particular location. The relationships between environmental quality and real property value cannot be undermined as it is evident that household will prefer to stay in a good environment where they can enjoy maximum benefit in relation to rent or land value expended.

3. Methodology

Selection of sampled neighbourhoods and Sample size Determination

There are 25 neighbourhoods in Minna; cluster sampling technique was adopted in the selection of sample areas for the study. The peripheral residential neighbourhoods were zoned into three namely; South-West peripheral, North-West peripheral and North-East peripheral zones with each zone representing a cluster. Two neighbourhoods were randomly selected within each cluster (zone) to ensure equal representation from each zone. The selected neighbourhoods formed the sample areas for this study and they include Barikin-Sale and Shango from the South-Western zone while Fadikpe and Dutsen-kura (Gwari) were selected in the North-Western zone and the North-Eastern zone has Bosso and Maitumbi (Figure 1). A sample size of 600 was drawn out

of the total 18,387 households in the sampled neighbourhoods using Adams et al.(2007) simplified formula ($n0 = Z^2 a/_2 \times P(1 - P)/d^2$). Estimation rate and precision range of 50% and ±4 respectively were adopted in determining the sample size. The sample size was distributed proportionally amongst selected neighbourhoods while systematic random sampling technique was adopted in the administration of questionnaires. Data analysis was conducted using descriptive (mean; percentages) and inferential statistics (correlation; significance test).

Technique for assessing environmental quality and Rental value

Houses and infrastructure conditions were assessed using 29 variable (Appendix I) while current rents passing on residential property for the year 2014 were used in the study. Variables used in assessing environmental quality were rated on 5 point scale and summed up to determine the 'perfect condition' score. A summation of all scores by a particular neighbourhood was divided by the total possible score of an ideal neighbourhood, that is, the "perfect score" to get the environmental quality index number. For the purpose of this study, all buildings and infrastructure variables used in the assessment of environmental quality summed up to twenty-nine (Appendix I). The rating scale was adopted from AAPPA- Australian Association of Higher Education Facilities Officers, (2000) and ranges from 0 -1 (Very Poor= 0.00-0.19; Poor 0.20-0.49; Fair 0.50-0.74; Good 0.75-0.94 and Excellent= 0.95-1.00). Mean environmental quality indices derived from each neighbourhood was correlated against the mean rental evidences in the sampled neighbourhoods using Pearson's Moment Correlation coefficient to assess the effect of quality on rents. Results were presented using tables and figures.

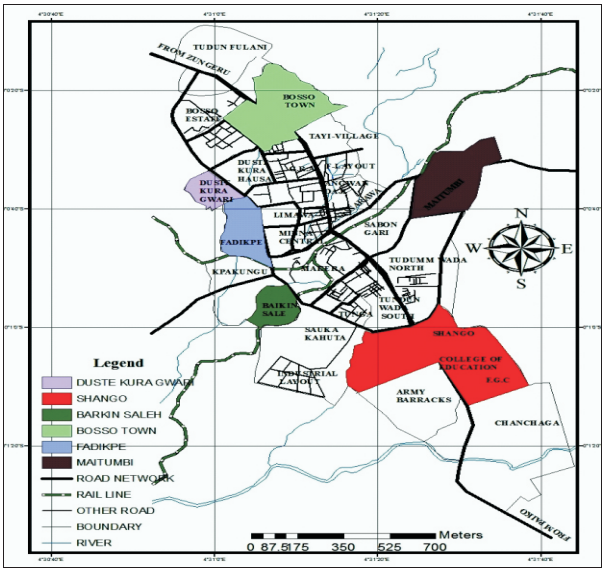

Figure 1: Map of Minna Showing the Selected Neighbourhoods

Source: Author, 2014

4.0. Results and Discussion

4.1. Environmental Quality and Rents across Sampled Peri-urban Neighbourhoods

Results of analysis revealed that housing characteristics differed across selected neighbourhoods; varying from old dilapidated structures to fairly new and modern structures. Field investigations and data analysis showed that Fadikpe and Dutsen–kura neighbourhoods had more numbers of modern houses that were still in good structural condition than the other four neighbourhoods. On general assessment, condition of houses in Fadikpe rated high on the condition scale with condition index of 0.79; which implied that houses in the neighbourhood were generally in good condition while conditions of houses in the other five neighbourhoods rated fairly on the scale with indices ranging from 0.62 to 0.74; with Maitumbi neighbourhood having the least index. Infrastructural conditions also rated fairly on condition scale, with condition index scores ranging from 0.52 to 0.65. Conditions of infrastructure in Bosso, Maitumbi and Shango neighbourhoods were the worst amongst sampled neighbourhoods with condition index score of 0.52, 0.55 and 0.56 respectively. Conditions of infrastructure in Fadikpe, Dutsen-kura and Barikin-sale rated better than the first three neighbourhoods mentioned with condition indices scores of 0.65, 0.61 and 0.60 respectively.

Mean rent (₦152, 400.00) in Fadikpe neighbourhood is higher than the other five neighbourhoods. The least mean rent (₦37,169.60) was recorded in Maitumbi neighbourhood; even though it rated equally with Bosso in term of environmental quality index (Table 1).

Table1: *Environmental Quality Indices and Mean Rents in Peri-Urban Neighbourhoods*

S/N	Neighbourhood	Mean Infrastructure Indices	Mean Building Condition Indices	Mean EQI	Mean Rent (₦)
1	Shango	0.56	0.67	0.62	62, 377.78
2	Fadikpe	0.65	0.79	0.72	152, 400.00
3	Dutsen-kura	0.61	0.74	0.68	94, 340.43
4	Barikin-sale	0.60	0.71	0.66	80, 523.81
5	Maitumbi	0.55	0.62	0.59	37, 169.60
6	Bosso	0.52	0.65	0.59	61, 300.33

4.2. Relationships between Environmental Quality and Rents

The result of correlation between environmental quality and rental values revealed moderate significant relationship in Shango neighbourhood (r= 0.524, p= 0.000), while analysis revealed very weak non-significant correlation between environmental quality and rents ®= 0.202; p= 0.285) in Fadikpe. Environmental quality accounted for only insignificant 4.08% (r^2= 0.048) variation in rental values within Fadikpe neighbourhood; which implies that 95.92% variation in rents in the neighbourhood is associated with some other factors such as; physical, legal and locational attributes of

individual houses other than environmental factors. There is a moderate correlation between environmental quality and rental values (0.560, p= 0.000) in Dutsen-kura while strong positive correlations existed between environmental quality and rents in Barikin-sale (r = 0.766, p= 0.000). The coefficient of determination (r^2) = 0.587, an indication that about 58.7% variation in rents was explained by environmental quality in the neighbourhood (Table 2; Appendix II).

Moderate positive correlation was observed between environmental quality and rental values in Bosso (r= 0.55, p= 0.000) and weak correlation in Maitumbi (r= 0.312, p= 0.00). Results of summary of analysis (r= 0.48, N= 591, p= 0.000) for all sampled peri-urban neighbourhood (Table 2) revealed moderate significant correlation between environmental quality and rents in the neighbourhoods. This implied that, only 23% variation in rents in the peri-urban neighbourhoods can be attributed to environmental quality factors while 77% of the variations in rental values can be attributed to other factors.

These findings agreed with that of Adama (2011) who observed that influence of neighbourhood quality on property value was very minimal in Minna neighbourhoods. Using regression analysis, he observed that it was only 7% variation in rents that was explainable by the quality of the environment and concluded that there were other unexplainable factors which according to Ling and Archer (2006) could be physical, locational and legal characteristics of the property.

Table 2: *Correlation between Rents and Environmental Quality in Selected Peri-Urban Neighbourhoods of Minna.*

Peri- Urban Areas	Valid Cases(N)	Correlation®	Sig. Level
Shango	45	0.524**	0.000
Fadikpe	30	0.202	0.285
Dutsen-kura	47	0.560**	0.000
Barikin-sale	42	0.766**	0.000
Maitumbi	125	0.55**	0.000
Bosso	302	0.312**	0.00
All Selected Neighbourhoods	591	0.48**	0.000

** Correlation is significant at the 0.01 level (2-tailed).

5.0 Conclusion and Recommendations

The paper examined the relationship between environmental quality and rental values in the peri-urban neighbourhoods of Minna. Results of analysis revealed that there is slight difference in the environmental quality as depicted in the different environmental indices value. Analysis of environmental quality and mean rents revealed moderate linear relationships between quality of the neighbourhood and rents. This simply implies that the higher the quality of the environment, the higher the rental value of residential accommodation.

This can be seen in the case of Bosso and Fadikpe, where similar property command different rental value. The research established also that the volatility of property in selected area is a function of number of choices available to tenants. Also, it shows that investment in different neighbourhoods will yield different return over and above the construction cost.

Conclusively, this research has shown the trend of investment in the future as developers will prefer location that will provide maximum return on their investment over a period of time. It is therefore recommended that government and community concern should focus on infrastructure provision and refurbishment of existing ones. Also, investors in residential housing should imbibe routine maintenance in order to improve the quality of the houses, thereby enhancing the quality of the environment.

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