WILLINGNESS TO PAY FOR INTANGIBLE ENVIRONMENTAL AMENITIES
IN ANGUWAN ROGO-ANGUWAN RIMI, JOS, NIGERIA

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ABSTRACT

Real estate is a package that extend beyond dwelling home but encompasses social, neighbourhood and environmental amenities and characteristics. The provision of basic amenities and services to accommodate the increasing population is among the major challenge of successive government in Nigeria. The property or rental values are influenced by residents' willingness to pay (WTP) for both neighbourhood and environmental amenities or characteristics. The aim of this dissertation is to evaluate the tenant willingness to pay for intangible environmental amenities in Anguwan Rogo-Anguwan Rimi Jos, Nigeria. A questionnaire survey was used with 389 household as total respondents, only 369 questionnaire were return and used for analysis. Among the 11 environmental variable, only 4 are found as amenities to be improved in the study area. Correlation analysis was used to find the relationship between monthly income and the willingness to pay for environmental variables. Among the 11 variables, only 3 seem to have significant relationship with the monthly income. This are electricity, household size and educational standard. The rental model was developed of willingness to pay environmental amenities using hedonic pricing concept, were the R value is 0.98 and the adjusted R^2 value is 0.96 meaning that 96% of variance in WTP is predicted by all the 12 variables. The F value is 749.71 which is statistically significant. Out of the 12 independent variable, 7 variables are statistically significant. These includes improved drainage, air quality, water supply, waste dump site, accessibility, natural lightening as well as improved security with t value of 14.69, 7.43, 2.28, 23.61, 22.85, 26.94 and 9.72 respectively. It was recommended that the model can be used to evaluate tenant's willingness to pay for environmental amenities in Anguwan Rogo-Anguwan Rimi Jos, Nigeria.

ABSTRAK

Harta tanah adalah satu pakej yang tidak hanya terhad pada penyediaan kediaman malah merangkumi sosial, kejiranan dan kemudahan alam sekitar dan ciri-cirinya. Penyediaan kemudahan dan perkhidmatan asas untuk menampung penduduk yang semakin bertambah adalah antara cabaran utama kerajaan Nigeria. Nilai harta atau sewa dipengaruhi oleh kesediaan penduduk untuk berbelanja bagi kejiranan dan kemudahan alam sekitar atau ciri-cirinya. Tujuan kajian ini adalah untuk menilai kesanggupan penyewa membayar untuk penggunaan kemudahan alam sekitar tidak ketara di Anguwan Rogo-Anguwan Rimi Jos, Nigeria. Tinjauan soal selidik telah digunakan dengan 389 isi rumah sebagai jumlah responden, hanya 369 soal selidik telah mengembalikannya dan digunakan untuk analisis. Antara 11 pembolehubah alam sekitar, hanya 4 pembolehubah yang perlu diperbaiki yang terdapat di kawasan kajian. Analisis korelasi digunakan untuk mencari hubungan antara pendapatan bulanan dan LPA bagi pembolehubah alam sekitar. Antara 11 pembolehubah, hanya 3 mempunyai hubungan yang signifikan dengan pendapatan bulanan. Pembolehubah itu adalah elektrik, saiz isi rumah dan standard pendidikan. Model sewa telah direka berdasarkan kesediaan untuk membayar kemudahan alam sekitar menggunakan konsep harga hedonik, nilai R adalah 0.98 dan nilai R2 diselaraskan adalah 0.96 yang bermaksud bahawa 96% daripada varians dalam LPA diramalkan oleh semua 12 pembolehubah. Nilai F adalah 749,71 yang secara statistiknya adalah signifikan. Daripada 12 pembolehubah bebas, 7 pembolehubah secara statistiknya adalah signifikan. Ini termasuk saliran yang lebih baik, kualiti udara, bekalan air, tapak pembuangan sisa, kecapaian, pencahayaan semulajadi serta keselamatan yang lebih baik dengan nilai t pada 14.69, 7.43, 2.28, 23.61, 22.85, 26.94 dan 9.72 bagi setiap pembolehubah yang dinyatakan. Model ini disyorkan untuk digunakan bagi menilai kesanggupan penyewa membayar untuk penggunaan kemudahan alam sekitar di Anguwan Rogo-Anguwan Rimi Jos, Nigeria

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LIST OF SYMBOLS

WTP	-	Willingness to pay
R	-	Rent
X_n	-	Attributes
ε	-	Coefficient of X
Y	-	Income
EQ	-	Environmental quality
SE	-	A row vector of social economic characteristics
C	-	A vector of demander shifter
n	-	Sample size
N	-	Population
e	-	Level of precession of sampling error
CV	-	Capital value
NI	-	Income or annual rental value
YP	-	Years purchase or present value of one naira per annum

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LIST OF ABBREVIATIONS

DRAINAGE - Amount willing to pay for improved drainage

ELECTRIC - Amount willing to pay for regular electricity

AIR - Amount willing to pay for improved air quality

WATER - Amount willing to pay for regular water supply

DUMPST - Amount willing to pay for improved dump site

ACCESS - Amount willing to pay for improved accessibility

NATRLIGHT - Amount willing to pay for improved natural lightening

SECURITY - Amount willing to pay for improved security

INCOME - Tenant monthly income

EDUC - Educational qualification

DIST - Distance from waste dump site

HOUSEHLDSIZ - Household size

CHAPTER 1

INTRODUCTION

1.1   Background to the Study

Housing has been universally accepted for human habitation which is considered as the third next to food and clothing, it is more than just a home, it encompasses utilities, environmental amenities as well as services which enhance quality neighbourhood (Adedeji *et al.*, 2010; Nwosu, 2015). Possibly, provision of basic amenities and human services for its increasing population is among the major challenges of successive government in Nigeria in making her habitable (Olujimi, 2010; Nwosu, 2015).

The property value could be attributed to property as a package of goods and services (Bello and Bello, 2008). Real estate entails more than just a dwelling as it includes social and neighbourhood features as well as environmental attributes. Therefore, property rental value or transaction price is a function of willingness to pay (WTP) for environmental, locational features and attribute of the property in its location or neighbourhood. Hence, property is not just building but includes environmental features attributes.

According to Bello and Bello (2008) it is difficult to determine environmental influences on value. Especially in Nigeria, considering the wide range externalities (positive and negative) that affects property market as a result of externalities. Water pollution, unpleasant condition of environmental sanitation, spread of squatter settlements, lack of accessibility and improper waste disposal arrangement or system, etc. are negative externalities while positive externalities entails good access road, air quality, electricity supply, security, landscaping amongst others.

The influences of environment are therefore characterised and evidenced in pull and push effect of the neighborhood on the prospective buyer or occupant of the property (Bello and Bello, 2008). A push effect like the air and water pollution may have effect on property value on one hand and occupant's derivable satisfaction from the property occupied and environment on the other hand (Jackson, 2001). Hence, occupants' satisfaction in respect of their shelter and environment, is social, behavioural, cultural and environmental features, not by engineering elements alone (Onibokun, 1974; Bello and Bello, 2008)

Moreover, susceptible property(s) or vulnerable facility(s) is expected to be avoided by a would-be rational investor or occupant based "buyer". This is expedient because of difficulty to sell or lease, potential health risk, uncertainty and nuisance associated with environmental contamination and stigma (Patchin, 1994). Occupants may seek to approach or have properties which they hold positive attitudes in order to gain satisfaction, increase by professionals. The methodology for estimating values, benefit cost of changes in quality (Ferreira and Moro, 2010).

In line with Whitbread and Bird (1973), this research focuses on environmental attributes that improves community's welfare and positive changes in the part of authorities for the benefits of the property/house occupants. The efficiency and effectiveness of these depends on provision of infrastructural amenities or services (Nwosu, 2015; Babarinde, 1998). Availability of these amenities is pivotal to value of

property (Hammer *et al*., 2000), which often leads to competition for such locations. This is because it enhances the value of property and vice versa

According to Lorenz *et al.* (2008), Hoch and Waddell (1993) and Berry and Bednarz (1979) property and rental values has to do with the overlapping effect of neighbourhood and environmental attributes. Adequacy of these infrastructural amenities increases economic and social value to land and landed property thereby attracting would-be occupant or buyer and enhances their WTP in the concern land and landed property (Nwosu, 2015). In Nigerian, the main issue is how will real estate market reflect these factors (environmental) as factors to determine WTP, using Anguwan Rogo-Anguwan Rimi a part of Jos metropolis. In this context, the objective is to find the amount housing occupants will be WTP for improvement as a resulted from provision of such environmental amenities.

In developed countries, several studies have been done in the past on environmental amenities and property values (Des Rosiers *et al.*, 2000; Diamond, 1980). Their findings cannot be directly applied in developing countries such as Nigeria, this is because of differential property market characteristics, culture difference, contextual setting among others. Few studies conducted in Nigeria focused on negative affect of environment on value of property (Arimah, 1996; Arimah and Adinnu, 1995; Bello and Bello, 2008; Akinjare *et al.*, 2011a; Bello and Ajayi, 2010). (Bello and Bello, 2008) looked at both the positive and negative influence. Therefore, there was no study which discuses only the positive effect of environmental amenities, hence it is identified as void. Therefore, this study attempt to fill the gap identified above through appraising the impact of intangible environmental amenities on rent payable in term of WTP by the tenants' desire environmental amenities. The study correlates between monthly income and the amount that tenant are WTP for improved environmental amenities as well as developed rental model for WTP for these improved amenities/services.

1.2   Statement of the Problem

It has been established that low income households have less ability to pay for services compared with their high income counter parts. This discovery as noted by (Islam) 2012, as a result of the fact that high income households have both the ability and willingness to pay premium price for those services in a sustainable manner.

As posited by Laliberté (2008) house prices depend on both tangible and intangible or less tangible household characteristics. Among these characteristics are those of the environment and the average income of household were found to be of significant role in determining house prices or rent. Anguwan Rogo - Anguwan Rimi was chosen partly because it is a place for majority of urban poor in Jos Metropolis, and partly because the housing supply is by private individual which may either be owner occupier or tenant.

The household has a choice as to range of prices to alternative accommodations, for tenants, he pays rent on periodic bases to the property owner. He would have expectation with related price change. For landlord, has no rent outlay to anyone for occupation but to himself. Therefore, he participate simultaneously as landlord and tenant.

The environmental amenities is an important value determinant in property (Akinjare *et al.*, 2011b). Property value tend to be high where adequate and good are provided and poor amenities in an area tend to experience low rate in rental value.

The environmental amenities have conflicting preferences and competition. Their presence entails high rent and absence leads to low rent deter investors and attract poor tenants (Nwosu, 2015).

Given the nature of Anguwan Rogo - Anguwan Rimi settlement (a district in Jos) characterized by poor access roads, poor ventilation, poor natural lighting, lack of adequate drainage, poor electricity supply, poor water supply, high crime rate, lack of waste dump site and the general unplanned situation of the neighborhood. This study focuses on evaluating the social- economic status of tenants in relation to their WTP house rental for positive change in their environmental or the neighborhood quality.

1.3   Research Questions

i.   What are the various environmental amenities that need improvement in the study area?

ii.   What is the relationship between the tenants' monthly income and the amount they are willing to pay for improved environmental amenities?

iii.   What is the best rental model that can measure occupants' willingness to pay for the provision of improved environmental amenities in study area?

1.4   Aim of the Study

The aim of the study is to evaluate tenant WTP for improved environmental amenities in residential property market with a view to providing stakeholders with necessary information for decision making.

1.5   `Objective of the Study

    i.   To identify the various environmental amenities that needs to be improved in the study area.

    ii.   To identify the relationship between the monthly income of the tenants and the amounts they are willing to pay for the provision of improved environmental amenities.

    iii.   To develop Rental model that measures tenants (WTP) for improved environmental amenities in the neighbourhood.

1.6   Scope of the Study

The research is restricted to evaluating the tenant WTP for improved environment amenities of residential property investment with reference to Anguwan Rogo - Anguwan Rimi neighbourhood of Jos metropolis. The study will focus its attention on those amenities that needed to be in place to improve environmental quality of residential property investment in the study area, taking into consideration the environmental and locational attributes which are refers to as the external attributes.

According to (Nwosu, 2015), the property value assessment is related to unique characteristics of the property which either gives satisfaction or dissatisfaction to occupants/tenants. These characteristics are either external or internal related to the property. This study only considers the external characteristics or factors (environmental and locational attributes).

1.7   Significance of the Study

The purpose of this study is to provide a comprehensive data on the significance of tenant willingness to pay for improved environmental qualities of residential property investment in Jos metropolis. This project work will go a long way in creating awareness to the would-be investors/ investors on opportunities available for investment and effect of lack of those environment qualities/ services on the general performance of residential properties in the rental markets.

The study will be of great importance to governments in making housing policies and promulgation and/or amendment of planning and environmental laws as the study will reveal those environmental amenities that need to be improved.

This research will add to the general body of knowledge also will be an available source to other researchers in the future for their research works such as projects, thesis, paper and term paper which can be reference to in their project work.

The study will provide a guide for future planning proposal and also enlighten the general public on the performance of residential property qualities in Anguwan Rogo - Anguwan Rimi and similar area in other neighborhood of Jos metropolis.

1.8   Methodology

For the purpose of this research, the methodology adopted includes the theoretical and empirical approach. Literatures on previous studies were visited on willingness to pay for environmental amenities using either the direct or indirect approach to measure the amount tenants or occupants are WTP for any change in

quality of the environmental. Primary data were sourced through questionnaire survey where respondents were to be randomly selected from the population in the study area and SPSS will be used to analyze the data whose results will be presented.

This research work is to be conducted in three stages; first stage is the theoretical part of the study which is followed by the empirical studies which involves the use of statistical tools. The identification of the research issue, review of related literature as well as aim and objectives were formulated. The essence is to launch a theoretical framework for this research. Then the empirical aspect which involves the use of Hedonic model to identify the significant environmental factors which will enhance the rental value of the property by extension influencing the tenant willingness to pay for improvement of such environmental services/amenities. The additional rent that the tenant are willing to pay shall be measured and a rental model will be developed.

The Hedonic equation is given the relation as presented in equation: 1. the attribute X_1 to X_n, β_1 to β_n coefficient the attributes and ε the error:

$$R = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots\ldots + \beta_n X_n + \varepsilon \qquad (1)$$

The WTP is estimated using the equation: 2, where WTP is a function income, environmental quality economic and social characteristics and demander shifter.

$$WTP = f(Y, EQ, SE, C) \qquad (2)$$

1.9   Chapter Layout

This thesis is made up of five chapters, the contexts were briefly discus as follows;

The first chapter provides an overview of the research work which is set out to achieve the research objectives. Its start with the background of the study, statement of the problem, research question, aim and objectives, scope of the study, significant of the study, brief methodology as well as chapter layout.

The second chapter gives account of the theoretical framework of the research. It begins with the concept of property, the property market, housing attribute the local government methodology for valuing environmental amenities as well as willingness to pay based on previous literatures.

The third chapter describes in detail the methodology adopted for the study, this includes brief description of the study area, the population, research design and methodology, sampling, sources and method of data collection and analysis.

The fourth chapter covers the empirical analysis which focus on identifying the significant environmental amenities which influences the tenant willingness to pay. Then the Hedonic rental model was developed to compute the additional how much the tenant are WTP for the change in their environmental quality. This was done by the use of hedonic model.

The fifth chapter is the concluding chapter of the thesis, it provides a summary of the research findings, the research conclusions as well as useful recommendations.

1.10   Conclusions

This chapter provides an overview of the research work starting with the general background on the housing and housing attribute, a description of the research problem. The formulation of the research questions, aim and objectives as well as scope and significant of the study were defined. Also, a brief explanation of the methodology was provided. Finally, a sequence of the items in the chapter was presented.

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