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Economic Impact Appraisal of Municipal Solid Waste Dumpsite on Nearby Properties Using HEDONIC Model

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ABSTRACT: The disposal of municipal solid waste in dump sites located near to existing properties is a serious problem in developing countries, and littering of MSW is common in the streets that does not have adequate final disposal and responsible for serious negative impacts human health and the environment. This work studies theoff-site economic impact of solid waste dump on value of nearby residential properties with particular reference to Offa metropolis, Kwara state, Nigeria. The study hypothesized that solid waste dumpsite has no significant effect (positive or negative) on the values of its proximate properties. The hypothesis is tested with a standard hedonic pricing model using a sample of 450 respondents across the study area. The F- statistics for the model are highly significant at the 1% level, and R2 values are high in the model suggesting that a very high significance could be placed on the results and that the eight housing attributes considered sufficiently account for variation in apartment rentals the study area. Out of the eight explanatory variables used in the analysis, five of them show positive signs of considerable impact on rent apartment price. The findings in this work suggest that waste dumpsites within fully developed residential area should be closed down and relocated. It is further suggested the need to introduce a recycling programmes through modern methods with a view of turning waste to wealth in the study area as it has being practiced in neighboring State of Osun, Nigeria.

KEYWORDS: Hedonic model, Dumpsites, Property value, Regression Model, MSW, Offa

I. INTRODUCTION

The urbanization and its attendant anthropogenic activities generate humongous municipal solid wastes (residential and commercial).Waste generation in a community and its corresponding clean-up cost tends to increase as the demand for quality of life increases (Chen, Geng& Fujita, 2010).In developing countries, as in Nigeria, most of these wastes end up in municipal dump sites as against engineered or sustainable landfills (Guerrero, Maas,Hogland, 2013).The construction of building structures on abandoned/closed municipal solid waste dumpsites or closer to any active site is becoming a major environmental and public health concern. In fact, proponent literatures reviewed suggested strong positive association exist between human ill health and proximity/exposure to dump orlandfill sites (Giusti, 2009; Ayomoh, Oke, Adedeji, Charles-Owaba, 2008).Economic theory implies that "all things being equal", prospective buyers would specifically avoid purchasing any contaminated or hazard prone land properties; such as waste dumpsites characterized by very low marketability index. Such properties are usually avoided on account of their unattractiveness attached to redevelopment potential, experienced or anticipatory environmental hazard and most importantly, the risk involved for residential building purposes (Olorunfemi,2011;Zhen-shan, Lei, Xiao-yan, and Yu-mei, 2009).

Any waste repository (dump site or engineered landfill) is characterized by contaminated water called leachate. The toxic water is usually produced by rainfall percolating the surface of deposited solid waste, picking up and/or dissolving soluble (biodegradable) (Karagiannidis, Papageorgiou, Perkoulidis, Sanida, Samaras, 2010) and insoluble(non-degradable) toxic and carcinogenic (Zhang, He & Shao, 2009)materials. Thereafter, the leachate finds its way and contaminates the natural but scarce ground water (Oyeleke, Olumorin, & Kamarudin, 2015; Kim, Endo, Sato, Matsuo, Matsuto, 2009).Aside leachate generation, the presence of biodegradable materials in the municipal dump sites having the potential to release flammable and explosive gases as they decay, further destabilizes and impoverishes geotechnical and foundation engineering properties of the residual organic (matters) soil formed. Researchers have also shown that methane produced at solid waste dump or landfill sites contributes approximately 3-4% to the annual global anthropogenic greenhouse gas (Butu&Mshellia, 2014;Couth &Trois, 2010; Zhang, He & Shao, 2009; Liamsanguan&Gheewala, 2008). Where buildings are cited in the dump site, the likely presence of toxic or chemical

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contaminants in the waste may as well attack installed building materials orweakens the structural foundation, which interface between the construction and the ground itself (Rai& Mishra, 2016).
The complexity of the technical attention and the huge attendant corresponding cost involved for "hard" forms of developments for example, buildings or structures (Rai& Mishra, 2016) often renders municipal solid waste dump site ground an abandoned land. As such, not attractive to potential property investors. Developers see solid waste dumpsites as organic soil contaminated sites, characterized by low dry density and shear resistance, high permeability and compressibility and high rate of settlement, from the geotechnical engineering standpoint. In addition to that, structures built on peat soil from solid waste are liable to high total or differential settlement, therefore not suitable for infrastructural developments (Butu& Mshelia, 2014). Deleterious chemicals present in the leachateadverse environment may as well attack the concrete foundation, thus weakens the concrete strength and eventually result in corrosion of reinforcement and finally structural failure.
Findings of Butu and Mshelia (2014)indicate thatthe shoulders of the major streets of towns and cities been used as temporary or permanent dumpsites for daily waste generated. This littering attitude possesses significant aesthetic blight, which is unacceptable. More importantly, the littering attitude is unpleasant from the standpoint of city hygiene, coupled with the high financial costs associated with the cleanups of these places (Al-Khatib, Arafat, Daoud, Shwahneh,2009;Ayomoh et al., 2008).Also, several open space community facilities such as children playground or adjoin spaces to recreation centres and even water ways/bodies are often been used as temporary or permanent waste dump sites (Dangi, Urynowicz, Belbase, 2013;Giusti, 2009).Furtherance to this and for long, it has been the common practice in the low economy countries (e.g. Nigeria), that abandoned land such as laterite and solid mineral mines, ravines, disused quarries, or excavated pits away from residential areas or business communities etc., were usually considered convenient as waste disposal unit;a strategy of land reclamation with intension of adding to its economic value (Olorunfemi, 2011; Imam, Mohammed, Wilson, Cheeseman, 2008). This strategy is not uncommon when rapid urban development catch up with these abandoned lands (Rai&Mishra, 2016;Olorunfemi, 2011).

II. ECONOMIC PERSPECTIVE OF HOUSING DEMAND AND POPULATION INFLUX

The search for better living standard in a typical African setting has resulted to massive migration from villages to urban areas, characterized by population explosion (Bello & Bello, 2008). This has increasingly put pressure on housing demands, and therefore, the consideration for property development closer to or directly on abandoned municipal dumpsites. Generally, urbanization has significantly result to living very close to places that are environmentally unattractive, which to date continue gaining upper hand (Dangi et al., 2013).Sometimes, such development is driven by economic opportunity (cheap and/or well-located land), other times by necessity; the only available space or proximity to palace of interest(Bouazza and Kavazanjian Jr. 2001). According to Bello and Ajayi (2010), thereis wide range of negative and positive externalities that the environment impacts on market value of property. Genuine sustainable evaluation should take place within a framework that incorporates three dimensions of performance: (1) social, (2) environmental and (3) economic(Kryvobokow& Wilhelmsson, 2007). In this regard, solid waste dumpsites located within residential neighborhoods have drawn the attention of economic. Wilhelmsson (2008) and allied (Munoz-Cadena, Arenas-Huertero, Ramon-Gallegos, 2009)researchers to the probable relationship between residential facilities and proximity of solid waste dumpsite.
Numerous studies have been conducted to determine an empirical relationship between residential property prices and proximity to a solid waste dumpsite in many countries, among which include studies on landfills conducted in Baltimore, Maryland by Thayer, Albers, and Rahmatian (1992). Reichert,Small, and Mohanty (1992) also carried out a similar research in Cleveland, Ohio. In Nigeria, Arimah and Adinnu (1995) did their study in Lagos; Adewusi and Onifade (2006) in Surulere, a sub-hub of Lagos; Bello (2007) in Lagos; Udo and Egbenta (2007) in Enugu. Results from these researchers generally support the notion that waste dumpsites have negative effects on property values. On the contrary, a few studies on the other divide (Bouvier&Conway, 2000; Gamble et al., 1982; Wilhelmsson, 2008)have found that no statistically significant relationship exists between house prices and proximity to a landfill site.
The intent of this study is to empirically examine the effects of municipal waste dumpsite on economic value of property proximity. Specifically, this paper utilizes hedonic price indexes to examine the binary effects of building structure and environmental characteristics on the cost of private rental housing in Offa;a large Nigerian urban setup in Kwara state. Results from this paper are of interest to the real estate and landscaping professionals, homeowners, economic and allied researchers and extension specialists advising on property selection and care, to mention but few. Nevertheless, the results of this study, although in line with most expectations, should be taken with caution because of several limitations. First, the hedonic pricing method only provides accurate estimations of the value of environmental

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quality if perfect information exists in the market (i.e. all buyers in the housing market have perfect information on the environmental quality variables at every conceivable location).
This assumption is however not met, as in reality people's awareness of the dumpsite most often is based on inaccurate and/or scanty information or complete lack of knowledge (Afon, 2007). For instance, if a dumpsite poses a serious health risk, individuals may not be aware of either its extent or its potential impact on house values. Second, the assumption regarding zero transaction costs is also not borne out in reality (Afon, 2007). Many individuals who reside in close proximity to a dumpsite maybe disturbed by the potential health risks it poses, but relocation costs may be prohibitively expensive. This often outweighs the incremental benefits derived from being situated further away from the dumpsite.

III. FUNCTIONAL FORM OF REGRESSION MODEL AND EMPIRICAL SPECIFICATION OF A STUDY

A. Functional form of regression model

Since the development of the hedonic pricing method, there has been much debate on the choice of a proper functional form of the regression model (Bello, 2008; Du Preez & Lottering, 2009; Kryvobokow & Wilhelmsson, 2007; Oduwole & Eze, 2013).In fact, to date, there is no guidance in economic theory that would support the "best" possible functional form or robust criteria for deciding the optimal model form. Instead, researchers are left to base their choice on (1) the rational goodness-of-fit measures and (2) the signs and significance of estimated coefficients. In their study of Hong Kong housing market, McCluskey and Rausser (2003) emphasized model form parameters as the date of sale, age of property, size, number of bedroom and bathrooms. Also included are number of garages, type of central heating, condition, neighborhood and group cluster.In a similar Hong Kong study, classified residential property attributes into four categories namely: (1) structural, (2) physical, (3) neighborhood and(4) environmental (Love, 2000 in Wokekoro & Uruesheyi, 2014).
In a Nigerian study, Bello (2008), grouped the attributes of model form into those that are internalas well as are external to the property. Internal attributes is said to comprise the intrinsic characteristics of the property such as size, number of accommodation, condition, aesthetics, layout, age, and plot size, while external attributes include the general state of the economy, population, employment,immigration, finance, location, infrastructure, transportation and neighborhood characteristics. Years back, Megbolugbe (1989) researched into the housing market in Jos,Nigeria. Interestingly, the researcher classified housing into three categories or traits: (1) structural (squaremeters, building age, roof cover, and plumbing fixtures); (2)neighborhood (schoolquality, road quality, and availability of electricity, water and other vital publicservices); and (3) locational (access to economic, social, and political activities suchas distance to central business district (CBD), shopping centers, parks, and other recreational facilities).What can be drawn from the aforementioned studies is that the housing attributes employed in a particular study would be those related and of relevance to the specific real estate market under consideration; thus, reflecting the factors which significantly influence the expectations and perceptions of participants in that particular market.

B. Empirical specification

The dependent variable chosen for this work was the selling price of the home. Selling price was determined to be a suitable dependent variable because it represented the value of the home when it was sold; the price was determined by the market conditions. Another reason is that the effects of the variables(internal and external attributes) used in the model would be easily interpreted in terms of the house selling price. The selling price of a home being used as the dependent variable is also commonly applied in most literatures involving hedonic property value analysis (Babawale, 2010; Friso & Henri, 2009; Komarova, 2009). Following Boardman et al., (2001),the hedonic price function(hpf) can be expressed as:

$$\text{Property value, } P = f(LOC_{ext}, TYPE_{int}, SIZE_{int}, VIEW_{int}, NEIGH_{ext})$$

The price of a house (P) can be seen as a function of its location (LOC, an external attribute) such as the access road;type of the house (TYPE, an internal attribute);size of the house (SIZE, an internal attribute) such as the number of rooms, bathroom cum toilets, the parking lots and ancillary facilities; the quality of its view (VIEW, an internal attribute) such as property condition; and the neighborhood characteristics (NEIGH, an external attribute), such as school quality and security. The change in a house price resulting from the marginal value change in one of these characteristics or dependent variables is called the hedonic price (sometimes referred to as the implicit price or rent differential).

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A variety of forms of the hedonic regression equations have been employed in the various real property related studies (Bello, 2008; McCluskey and Rausser, 2003).The linear model proves the simplest, and commonly used in the past (Bello, 2008). The linear hedonic regression model assumes that each property characteristic(variable)adds to the overall value in a simple aggregation fashion or superposition. For example, the first bedroom adds the same value as the fifth bedroom. For the purposes of thisstudy the following hedonic price function, proposed by Boardman et al., (2001)was specified:

$$P = \beta_o + \beta_j X_j + \beta_d + X_d + u \textbf{(i)}$$

where,

P = property value (the dependent variable), β_o= a constant term, β_j = estimated coefficients for continuous variables (internal and external independent), β_d = estimated coefficients for distance variables, X_j = jth property characteristic (internal and external independent), X_d = distance to dumpsite (external independent), and u = the error term.

By and large,the set of house rent variables considered relevant to the study area including their descriptions, codes, and measurements of various housing attributes are as tabulated in Table 1. Only those attributes which affect the prices of already paid for apartments, or the supplied prices in the surveyed sub-market are included in the hedonic equation. The GIS software is of significant assistance in analyzing and comparing different waste-management and collection alternatives in order to select the most cost-effective option, complying with legislative, technical and economic constraints (Komarova, 2009). However, given scarcity of secondary data on accommodation details, and unavailability ofGIS resource, a number of continuous variables were approximated.

Table 1: Definition of hedonic variables for the study area

Dependent Variable	**Variable Code**	**Variable Measurement**
Home selling price	SP	Measure in Nigerian currency (N)
Independent Variables	**Variable Code**	**Variable Measurement**
Internal attributes		
Number of car parking lots in the house	PARKING	Actual number
Number of bedrooms in the house	ROOM	Actual number
Number of bath/toilets in the house	BATH	Actual number
Condition of property	PRO-COND	1 if positive; otherwise 0
External attributes		
Distance to work	DIS-WRK	Kilometers (approximately)
Neighborhood security	SECURITY	1 if positive; otherwise 0
Location	LOC	1 if positive; otherwise 0

Note:1US$ = N366

Distance from dumpsite variable (DIS-SITE); captures the effect of dumpsite due to its proximity to property location. As such, a significant positive coefficient value for variable DIS-SITE in any estimated model is a pointer to the effects of dumpsite on house prices suggests that rental value of a residential property increases as distance from a dumpsite to property location increases. On the other hand, a significant negative coefficient is evidence indicating that the rental value of a residential property decreases as distance from a dumpsite to property location increases.

IV.STUDY AREA, DATA SAMPLE, AND RESEARCH DESIGN

A. Study area

The study area is Offa, the Headquarters of Offa Local Government Area (LGA), located in the southern senatorial zone of Kwara state. Based on the linear projection of Nigeria, of about 2.8% per annum (UDBN, 1998 in Imam, Mohammed, Wilson, & Cheeseman, 2008) and as at December, 2016, Offa has an estimated population of 153,317 and the second largest city in Kwara state (after Ilorin the state capital).There are four wards (Balogun, Eesa, Ojomu and Sawo)in the town. The vegetation in Offa is savannah and the city is presently agriculturally based (personal communication). Offa is noted for its sweet potatoes among other food. Offa and its environs (Ira, Illemona, etc) are predominated withhigh grade cashew-nuts as cash crop (personal communication). The key religions practiced in the town are Islam and Christianity. Offa is endowed with one of the very rich and valued cultural heritage in entire Yoruba land. This includes but not limited to Onimoka, Moremi, Molepe,Mosuwon, and Ijakadi, festivals (Afolabi&

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Tomori, 2013). Literally, Offa is transverse by a railroad from Lagos, the commercial capital of Nigeria, and the town served as the railway terminus before the line was subsequently extended to Kano and Nguru in northern Nigeria.

B. Solid waste generation and disposal system

Offa is predominantly residential, however, due to rapid commercial growth; the urban population of Offa LGAis increasing rapidly. The quantity of solid waste generation is mostly associated with the economic status of a societyAfon (2007).In Offa,the quantity and diversity of MSW has as well increased tremendously with improved life style and social status of the population, particularly inthe urban centers (Butu& Mshelia, 2014). As such, the annual waste generation has been observed to increase in proportion to the rise in population and urbanization. As obtainable in most of Nigerian cities (Afon, 2007; Butu & Mshelia, 2014; Imam et. al., 2008) and in other cities of the world (Chen et. al., 2010; Dangi, Urynowicz, &Belbase, 2013; Giusti, 2009; Guerrero, Maas & Hogland, 2013), solid waste disposal system in Offa is by (1) land filling in the onlylocal government approveddump site (located at Offa-Eesun); (2) Communal Collection System (CCS), involves the location of metal containers (skips) at designated sites known as transfer stations, shared by a number of housing units within that community. When the skips are full, they are transported by the few available skip loading trucksand emptied at the local government approved dump site as final disposal; and (3) more importantly, indiscriminate or selected waste dumping on any available open/abandoned land space (Afon, 2007).

C. Municipal solid waste management system

There are many different sources of municipal solid waste generation in Offa, this include the residential population, commercial establishments and public and private institutions. Issues related to the management of these wastes have in recent time become challenging as more lands is needed for the ultimate disposal of these solid wastes (Giusti, 2009). In addition to the scarcity in dumping ground, increase in the waste generation lacks corresponding investment in the collection, transport, treatment, and disposal facilities. These problems are further complicated by political, economic and social factors (Imam et al., 2008). The problems and constraints in waste management in the town include low collection coverage and irregular collection services, crude open dumping and burning without air and water pollution control, the breeding of flies and vermin (these pose serious environmental and social threats), and the handling and control of informal waste picking or scavenging activities. These public health, environmental, and management problems are caused by various factors which constrain the development of effective solid waste management system, hence dumping in abandon landed spaces eminently experienced.

V. DATA SAMPLE AND RESEARCH DESIGN

A. Data sample

The sources of data used for the work were both primary and secondary. At the onset, relevant secondary data were collected through relevant books, journals, published and unpublished research works, and internet sourcing. In concomitant, a reconnaissance visit was conducted from August 25 through August 31, 2006 to investigate contemporary waste management practice in Offa town. Thereafter, the study proper was conducted in the months of December, 2016 through January, 2017. Primary sources data comprise oral interviews with residents of the target area, developers; other stakeholders include real estate professionals, as well as members of the public. The study population comprises residence within 150 meters offset distance fromeach dumpsite within the metropolis. Using purposive sampling technique, 450 households' heads were served with the structured questionnaires; specifically designed for this study as the main tool for data collection. The questionnaires covered socio-economic characters of the respondents as well asfive independent variables: (1) location, designated LOC, (2) the type of house, as TYPE (3) the size of the house, as (SIZE (4) the quality of its view, as VIEW and (5) the neighborhood characteristics, as NEIGH. All the variables considered were chosen based on proponent literature reviewed (Nwosu& Olofa, 2015).

B. Research design

Questions related to knowledge about property development around dumpsites were sought from relevant respondents. Also, questions were directed to bring to fore knowledge on the impact of location of each waste repository has on the selling price of properties constructed near or on it. Two trained research assistants were afterwards employed for the

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questionnaire administration and subsequent collection from all targeted respondents. For each house identified in the sample, the following specific data were collected: the value of the property (as at July 2016 price levels), the location, number of rooms, bath/toilets, parking lots, the condition of the property, and neighborhood security. Though, the residences situated near most of these dumpsites are primarily low-cost units and the property market in the study area is neither well developed nordocumented by estate evaluators. However, due to scarcity of market transaction data, property valuations conducted by independent property evaluators were used as house prices. The differences in these valuations reflect the evaluator's perceptions of the relative market worth of the relevant properties at a given point in time.Pre-testing of the survey was conducted by a group of evaluators and responses were accordingly coded for statistical analysis.

Table 2summarizes the targeted characteristics of interest for the respondents. The data analysis shows that 78% were male while the remaining 22% constituted female of the respondents. In terms of formal educational attainment, only 2% of them never attended formal education institutions. Those who have up to secondary education were about 24%, while those with post-secondary education constituted 54%. It is of interest to note that thirty four per cent of the respondents were traders, where, 28% worked with different corporate organizations within Offa, 20% were civil servants, predominantly Railway Corporation and LGA workers. With respect to income level, 34.9% earned between N30,000:00 and N44,999:00, 34% earnings ranges between N15,000:00 and N28,999:00, while 20% earned less than N15,000.The remaining 11.1% earned N45,000:00 and above. It is of interest to note that US$1=N366as at the time of the survey.

Table 2: Major Characteristics of Respondents

Variable	Frequency	Percentages
(a) Gender Distribution of the Respondents		
Male	351	78%
Female	99	22%
Total	**450**	**100%**
(b) Distribution of the Respondents by Educational Qualification		
No formal education	9	2%
Secondary School or below	108	24%
Post-Secondary Education	243	54%
Others (please specify)	90	20%
Total	**450**	**100%**
(c) Distribution of Respondents by Job Classification		
Traders	153	34%
Civil servants	90	20%
Corporate Organizations	126	28%
Students	36	8%
Others (please specify)	45	10%
Total	**450**	**100%**
(d) Distribution of Respondents by Income Brackets (Per Annum)		
Less than N14,999	90	20%
N15,000-N28,999	153	34%
N30,000 - N44,999	157	34.9%
N45,000 and above	50	11.1%
Total	**450**	**100%**

Source: Field Survey 2017

VI. DISCUSSIONS OF FINDINGS

The results presented in Table 3 suggested that 56.4% of the respondents agreed that in recent time there has been an increase in development around the dumpsitein their area of resident, an indication that people's awareness of the residential development around the waste dumpsites cannot be ruled out. Interestingly, 60.6% of the questionnaire participants gave rapid urbanization as the main reason led to the increase in development around the waste dumpsites

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in their area of resident. Furtherance to that, 50.4% of the respondent strongly agreed with the question on whether they think the proximity of property to dumpsite will have a negative effect on its value. When asked what they consider as possible negative effects of waste dumpsite on a nearby property, 25.3% chose proliferation of insects and vermin; this was closely followed by those who considered wind blowing of trash (22.9%) as a negative effect to property near dumpsite.

Table 3: Analysis of the research questions

Variable	Frequency	Percentages
Q1: Do you think there has been an increase in development around the dumpsite in recent years?		
Yes	254	56.4%
No	196	43.6%
Total	**450**	**100%**
Q2: If your answer is yes in the above, what do you think might have led to this increase?		
Very cheap	75	16.7%
Because of its location	102	22.7%
Rapid urbanization	273	60.6%
Total	**450**	**100%**
Q3: Do you think the proximity of property to dumpsite will have a negative effect on its value?		
Yes	227	50.4%
No	223	49.6%
Total	**450**	**100%**
Q4: If your answer is yes in the above, what do you consider as possible negative effects of waste dumpsite on a nearby property?		
Air pollution	71	15.8%
Odor nuisance	85	18.9%
Blowing trash	103	22.9%
Proliferation of insects/vermin	114	25.3%
Health hazard	77	17.1%
Total	**450**	**100%**

Source: Field Survey 2017

a. Hedonic regression analysis of property off-site effectto waste dumpsite on apartment value

The summarized statistical regression parameters are presented in Table 4. The table depicts the effect of property off-site to waste dumpsite on apartment rentals. As can be observed, the F- statistics(which is used to test the null hypothesis that the variances of two populations are equal) are highly significant at the 1% level, and R^2 values of 0.749. The values suggested that a very high significance could be placed on the results, and that the eight housing attributes considered in the research sufficiently account for variation in apartment rentals in the study area. Some of the variables exhibited unexpected weighted betasigns in their correlations with housing price. Also presented in Table 4 is the student t-value column, which provides the individual significance of each independent variable in the regression equation and tells whether the variable is making statistically significant contribution to value of property. Pallant (2005) in Akinjare, Oloyede, Ayedun, and Oloke (2011) submitted that variable must have a significant value of less than 0.05 to make significantly unique contribution. The Durbin-Watson value for the model indicates that there are no autocorrelation among the independent variables.

In addition, the DIS-SITE coefficient is positive (+ 867.912) and statistically significant at 99% confidence level throughout the entire study area, suggesting that apartment renters viewed dumpsite in the neighborhood as a dis-amenity with negative impact on the prices of residential properties. Hence, rental value of a house increases as

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distance from dumpsite increases and vice versa. Therefore, the hedonic regression model specifically for this research is:

SP = -524066.53 + 308790.550NRoom + 97071.684NBath+ 867.912DIS-SITE - 44006.444PRO-COND + 25294.920PARKING+1099.480SECURITY-17409.120LOC-19538.958DIS-WRK **(ii)**

Table 4: Regression results of dumpsites within Offa metropolis

Variable beta	Weighted beta (coefficients)	Coefficient	t-value	Sig.
Constant (intercept)	-524066.528	-6.245	.000	
Number of bedrooms	308790.550	.675	11.513	.000
Number of bath/toilets	97071.684	.224	3.843	.000
Distance to dumpsite	867.912	.129	2.898	.004
Property physical outlook	-44006.444	-079	-4.781	.077
Parking space	25294.920	.046	1.018	.310
Neighborhood security	1099.480	.002	.044	.965
Location	-17409.120	-028	-.653	.515
Distance to work	-19538.958	-.035	-.807	.421
R^2= 0.749 (74.9%); F-statistic = 52.538 (p .000); Durbin Watson = 1.185; 1US$ = N366				

VII. SUMMARY OF FINDINGS

Across all the neighborhoods, the survey revealed that there are increases in the development around the dumpsites. Also, majority of the respondents agreed that rapid urbanization as strong reason that led to the increase in development around the waste dumpsite located in their respective locality within Offa town. In addition, majority of the respondents agreed that dumpsite has negative effect on its proximate property. Finally, the hedonic regression analysis result shows that dumpsite is a dis-amenity that impact negatively on the prices of residential properties. This finding do not depart markedly from that of previous studies (Akinjareet al., 2011) that neighborhood waste dumpsites generate negative effect on the prices of residential properties in close proximity.

VIII. CONCLUSION AND RECOMMENDATIONS

This study applied the hedonic pricing method to estimate the loss, if any, of property value due to the disamenity created by waste dumpsite proximity to it, using Offa metropolis as case study. A regression analysis was applied. The results suggest a need for more considered residential planning, particularly in low-income areas. More specifically, waste dumpsites that may have deleterious aesthetic, health and economic impacts should, ideally, be located far from residential neighborhoods or, at the very least; buffer zones should be created to prevent further encroachment. In the case of dumpsites in the study area, government and stakeholders should endeavour to keep the disused dumpsite as tidy as possible, and monitor it on a regular basis so as to safeguard the values of properties situated around it. Finally, there is the need to introduce a recycling programmes through modern methods with a view of turning waste to wealth in the study area as it has being practiced in nearby state of Osun. It is therefore, hoped that if the government at all level is able to look into the recommended solutions, the quality of the environment will be enhanced and this will positively affect residential property values in cities on a general scale.

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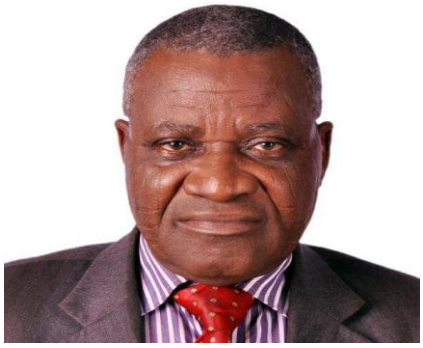

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