

## IMPACT OF WASTE DUMPS ON REAL ESTATE VALUES IN PORT HARCOURT

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### **ABSTRACT**

*This paper investigated the effect of waste dump site on real estate values in Rumuolumeni Community in Port Harcourt. Two sets of structured questionnaires were administered to property occupiers(Landlords and Tenants) and business operators within the dump area. Two hundred and twenty-five (225) questionnaires were retrieved out of which 210 were correctly filled and were found usable among the returned questionnaires. The research questions were analyzed with mean and standard deviation, while hypotheses were tested with Z-test statistics. The study has established that Rumuolumeni waste dump site has a negative impact on property values and health of residents within close proximity to the waste dump site. The study recommended that waste dumps should be sited far from residential areas and engineered sanitary landfill should be constructed to avoid pollution of the environment (water, land, and air) which is a huge threat to health and to enhance property values*

**KEYWORDS:** *Wastes, Dump Site, Environment, Real Estate, Value*

### **INTRODUCTION**

Waste generation is inevitable as long as life continually exists on planet earth (NEST, 1991). Waste is any solid or semi-solid material(s) which has been discarded by its primary user and may or may not be found useful by another person, but constitute a nuisance to people's health and the environment when left untreated. Waste could be explained, to mean leftovers, used products, whether solid or liquid having no economic value or demand and which must be thrown away (Isimirah, 2002). Disposal of waste is a challenge for many countries in both developed and developing countries because of the risk to human health and the general environment (Ossai, 2006).

According to Oluwande (2002), industrialization has increased the volume of urban wastecomprising heavy industrial wastes such as asbestos, cadmium, Lead compounds, textile dyes etc. With large populations in our cities, the financial aspect of managing waste dump sites constitutes a major hindrance for states in the federation (Ogedegbeand Oyedele, 2006). The aim of this paper is to investigate the impact of waste dump site on real estate values in the Rumuolumeni community in Port Harcourt. A Rumuolumeni community is located in Obio/Akpor Local Government Area of Rivers State. It houses the Ignatius Ajuru University of Education. Port Harcourt. Port Harcourt is the capital of Rivers State and has major oil and gas industries. The city has witnessed enormous growth since its inception and it is a veritable magnet attracting immigrants not only from rural areas, but also from urban centers in the country; these have serious implications of waste generation in the area.

The area has witnessed the enormous environmental mishap due to the presence of the dump site. Residents within the area complain of health issues and passers-by also complain of foul odors emanating from the dump site.

## LITERATURE REVIEW

Waste dumps sites have been found to have diminution on residential properties as far back as 1972 in American literature in one of the first studies of this type. (Hatlicek, Richardson, and Davies 1972) Hatlicek, Richardson and Davies (1972) found an increment in house pricing by \$0.61 per foot distance from the dump site in Fort Wayne, Indiana. Similar results were obtained from Toronto (Lim and Missions, 2003)

Gamble et al (1982) ascertained Hedonic price regression for residential property salesfigure near waste dumps in Boyertown, Pennsylvania. After splitting dataset and separate regressions estimated by year of sale, the estimated coefficient of residences from the waste dump was not statically significant at the 5% level. One of the estimated implicit prices was negative, implying higher prices closer to the waste. That is to say that the waste dump had no negative impact on the property values.

Nelson, Genereux, and Genereux (1992) found a diminution in residential property values within two miles of a particular waste dump with an average property value gradient of 6.2 per miles.

According to Mundy (1995), a clean (uncontaminated) property has a value equal to full market value and a dirty (contaminated) property which poses a health or financial risk (either real or perceived) will affect value significantly in several ways. According to him a disclosure requirement by the sales agent or seller, lender and appraiser uncertainty may have a noticeable effect on the marketability of the property. He added that when a property loses its marketability, it also loses its value. He also stated that income effect is the present value of the difference between the property value as if uncontaminated and the property value as if contaminated.

Reichert et al (1992), in a hedonic regression analysis for homes located near a Cleveland landfill in Ohio, found that the estimated marginal implicit Price (MIP) for distance was negative, implying homes had higher prices near the landfill. Furthermore, this estimated MIP was found to be statistically insignificant, with high sampling variability, and absences in the relationship between proximity to the landfill and home prices was argued to be caused by an unmodelled heterogeneity in neighborhood quality. By the use of a smaller and more homogeneous study area, residential properties near the landfill were found to sell for less than homes farther away.

Adewusi and Onifade (2006) focused on the effect of urban solid waste on the physical environment and property transactions in the Surulere Local Government Area of Lagos State. The study administered questionnaires randomly on residents and firms of estate agents to gather data on the subject matter. Data obtained were analyzed using frequency tables and percentage ratings. The study found that rents paid on properties adjoining waste dumpsites were lower compared to similar properties further away and also, property transaction rates were very slow and unattractive as one approaches a dumpsite.

Bello and Bello (2008) conducted a research on the willingness to pay for environmental amenities in Akure Nigeria. The study included environmental amenities such as refuse, wastewater disposal, water and electricity supplies, neighborhood roads and other locational services. The study used a two-staged hedonic model to examine the willingness to pay for better environmental services by residents of two neighborhoods in Akure, Nigeria. He combined multiple

regressions and predictive model to determine property values as a function of housing attributes and logistic model as a willingness to pay. The study identified households' income, distance away from the refuse dump site and regularity of electricity supply as the major factors that influenced household's willingness to pay for better environmental services. The study recommended economic empowerment of the people, diligent consideration in the location of dumpsites and adoption of public-private initiative in the provision of public infrastructure. The study established that real estate values are readily influenced by the residents' willingness to pay for both structural as well as neighborhood characteristics where the real estate is located.

Bello (2009) conducted a study on the effect of waste dump on real estate values in a Lagos State metropolis, using rental and capital value gradients across three neighborhoods (OkeAfa (Isilo), AgbuleEgba and Ojodu) close to refuse dumps, the study established that rental values of properties adjoining these locations have been reduced by 37% for block of flats at OkeAfa (Isilo) and 33% in Ojodu for tenement apartments respectively. Similarly a reduction in capital values of the vacant plots in the vicinities of AgbuleEgba and Ojodo ranged from 20% to 33% respectively.

Kumaret al(2004) found that poorly managed dump sites result of several environmental problems which include emission of obnoxious gasses, ground water contamination and leakage of methane gas.

## RESEARCH METHODOLOGY

Survey design is a method in which a group of items is studied by collecting, analyzing and interpreting data for a few people considered to be a representative of the study population. A descriptive research design is very suitable for large samples. Based on this the study adopted a descriptive survey research design. The population of this study comprises 130 property occupiers (residential properties) and 165 business operators (commercial properties) in the area of investigation. Simple random sampling was used to select respondents for the study. Therefore, through random sampling, 105 business operators and 120 property occupiers, making a total 225 people were selected for the study. Two hundred and twenty-five (225) questionnaires were administered, out of which 210 were correctly filled and were used.

The instrument used for the study comprised two sets of structured questionnaire. A four (4) point rating scale was used with the following response categories.

Strongly agree	-	4
Agree	-	3
Disagree	-	2
Strongly disagree	-	1 = 10
Means rating	-	$10/4 = 2.50$

Decision; responses equal to or above 2.50 is regarded as agreed, while responses less than 2.50 are regarded as disagreed.

The research questions were analyzed using mean rating ( $\bar{X}$ ) and standard deviation (SD) while hypothesis wastestedwithZ test statistical technique which has its constant variables as follows;

Degree of freedom (df) = 208

Level of significance (p) = 0.05

Critical value of Z = 1.96

#### Full Meaning of Terms

Standard deviation = SD

Mean = ( $\bar{X}$ )

Number of respondents = N

Calculated value of Z = Z

Standard Error= SE

**Decision rule** for hypothesis testing using Z test, if the calculated value of (Z) is less than the critical value (1.96) the hypothesis is accepted but rejected if the calculated value is higher than the critical value.

## RESULTS AND DISCUSSIONS

After retrieving the questionnaires, 210 were correctly filled and were found useful, and were therefore used for the data analysis below.

#### Research Question 1:

What are the effects of the waste dump site on the health of the inhabitants within the area?

**Table 1: The Effect of Waste Dump Sites on the Health of Inhabitants within the Area**

S.No	Variables	Respondents			
		Business Operators		Property Occupiers	
		$\bar{X}$	SD	$\bar{X}$	SD
1	Waste dumps give rise to cholera	2.68	1.70	2.78	1.87
2	Malaria arises from mosquitoes in waste dumps	2.70	1.82	2.68	1.70
3	Typhoid fever arises from pollution from waste dump	2.90	1.85	2.88	1.62
4	Pollution from dumpsite causes catarrh and cough	2.76	1.75	2.78	1.87

Table 1 indicated that all the meanscores of the health indicators were above 2.50, which showed that all the respondents agreed that waste dump site has a negative effect on the health of residents in the areas. The indicator with the highest mean is typhoid fever with a mean score of 2.90 and least is cholera with a mean score of 2.68.

#### Research Question 2:

What are the causes of improper waste management in Port Harcourt metropolis?

**Table 2: Causes of Improper Waste Management in Port Harcourt Metropolis**

S. No	Variables	Respondents			
		Business Operators		Property Occupiers	
		X	S D	X	S D
1	Insufficient fund	2.85	1.80	2.70	1.50
2	Inadequate trained personnel's	2.76	1.97	2.65	1.61
3	Lack of proper education	2.95	1.82	2.80	1.70
4	Poor equipment	3.40	2.65	2.96	1.80
5	Poor enforcement of waste management laws	2.78	1.80	2.76	1.65
	Grand Mean/ Standard Deviation	2.95	2.0	2.77	1.65

Table 2 showed that all the mean scores of the variables were above 2.50, which is an indication that all the respondents agreed that all the variables are the causes of improper waste management in the city. The predominant causes are poor equipment with a mean of 3.40, lack of proper education with a mean of 2.95 that is public enlightenment, which is closely followed by insufficient funding with a mean of 2.85. This implies that the provision of good quality equipment, educating the masses on the three R's (reduction, reuse and recycle) of waste management and provision of sufficient fund should be key priorities of governance to achieve sustainable and proper waste management and disposal.

**QUESTION 3:**

How does waste dump site affect the values of properties surrounding it?

**Table 3: Analysis of Responses on the Effect of Waste Dump on Property Values Surrounding It**

	Variables	Respondents			
		Business Operators		Property Occupiers	
		X	S D	X	S D
1	Waste dump affects rental values	2.86	1.82	2.78	1.80
2	Waste dump inhibits the interest of tenants	2.78	1.80	2.68	1.62
3	Dump site residents lack security of tenure	2.70	1.73	2.80	1.75
	Grand Mean/ Standard Deviation	2.78	1.78	2.75	1.72

Table 2 indicated that all the mean scores of the indicators were above 2.50, which showed that all the respondents agreed that the waste dump site has a negative effect on the rental values of both commercial and residential properties in the area. Table 2 also revealed that waste dump site affects tenure security and tenants' interest to continue in occupation of the properties in the area.

**TESTING OF HYPOTHESIS****Hypothesis 1**

Ho: There is no significant difference in the opinions of business operators and property occupiers (respondents) on the effect of waste dump site on the health of inhabitants within the area.

**Table 4: Z-Test Result on the Opinions of Business Operators and Property Occupiers on the Effect of Waste Dumps on the Health of Inhabitants within the Area**

Respondents	$\bar{X}$	S D	N	d f	p	S.error	Z.cal	Z.crit	Decision
Business Operators	2.77	1.42	100						
				208	0.05	0.20	-0.05	1.96	Accept
Property Occupiers	2.78	1.40	110						

Table 4 showed that the calculated value of the  $Z$  – test is -0.05, while the critical value is 1.96 at df of 208,  $P=0.05$ . Since the calculated value is less than the critical value, the hypothesis is accepted. We, therefore, conclude that there is no significant difference in the opinion of property occupiers and business operators on the negative effect of waste dump site on the health of inhabitants within close proximity to the dump site.

### Hypothesis 2

There is no significant difference between the opinions of the business operators and property occupiers on a causes of improper waste management in the Port Harcourt metropolis.

**Table 5:  $Z$ - Test Analysis on Causes of Improper Waste Management**

Respondents	$\bar{X}$	S D	N	d f	p	S.error	Z.cal	Z.crit	Decision
Business Operators	2.98	2.2	100						
				208	0.05	0.28	0.28	1.96	Accept
Property Occupiers	2.9	1.9	110						

Table 5 showed that the calculated value (0.28) is less than the critical value (1.96), therefore the hypothesis is accepted. It is therefore concluded that there is no significant difference in the opinion of property occupiers and business operators on a causes of improper waste management in the Port Harcourt metropolis.

### Hypothesis 3

There is no significant difference between the opinion of business operators and property occupiers on how waste dump sites affect property values.

**Table 6:  $Z$ -Test Resultson the Opinions of Business Operators and Property Occupiers on How Waste Dump Sites the Effect Property Values**

Respondents	$\bar{X}$	S D	N	d f	p	S.error	Z.cal	Z.crit	Decision
Business Operators	2.78	1.78	100						
				208	0.05	0.24	0.12	1.96	Accept
Property Occupiers	2.75	1.72	110						

Table 6 showed that the calculated value (0.24) of  $Z$  is less than the critical value (1.96), therefore the hypothesis is accepted. It is concluded that the waste dump site has a negative impact on both commercial and residential properties in close proximity to the dump site.

## CONCLUSION AND RECOMMENDATIONS

The study has established that the Rumuolumeni waste dumpsite has a negative impact on property values and health of residents within close proximity to the waste dump site. The study also found that poor equipment, insufficient funding, inadequately trained personnel, lack of proper education and lack of enforcement of waste management laws contribute to improper waste management in the Port Harcourt metropolis. The study further revealed that the waste dump site poses a huge threat to the health of inhabitants within the dump area and that the waste dump causes a significant reduction in property values within the dump sites. The study recommended that the waste dumps should be sited far from residential areas and engineered sanitary landfill should be constructed to avoid pollution of the environment (water, land, and air) which is a huge threat to health and to enhance property values.

## REFERENCES

1. Adewusi, A. O. and Onifade, F. A. (2006). "The Effect of Urban Solid Waste on Physical Environment and Property Transactions". *Journal of Land use and Development Studies*, Vol. 2.
2. Bello, M.O. and Bello, V.A. (2008). Willingness to pay for better Environmental Services: Evidence from the Nigerian Real Estate Market. *Journal of African Real Estate Research*, 1(1), 19-27.
3. Bello, V. A. (2009). *The Effect of Waste Dump Sites on Proximate Property Values in Lagos, Nigeria*. Unpublished Ph.D Dessert, Federal University of Technology, Akure, Nigeria
4. Gamble, H.B., Roger, H.D., James, S. & Donald, J. E. (1982) *Effect of Solid Waste Disposal Sites on Community Development and Residential Property Values*. Institute for Research on Land and Water Resource University Park: Pennsylvania State University.
5. Harlicek, Jr., J., Richardson, R & Davies, L. (1971). *Measuring the Impacts of Solid Waste Disposal Site Location on Property Values*. *American Journal of Agricultural Economics*, 53(5): 297-314.
6. Isimirah, N.O (2002): *Understanding the Nature, Properties and Sources of Waste for Quality Environment*. Port Harcourt: Tom and Harry Publications Ltd.
7. S. O Ojoawo, F. A Oginni, M. Jolayemi & O. J Adenrele, *Domestic Wastes Generation Pattern and Composition in Osogbo and Environs, Osun State, Nigeria*, *International Journal of Civil Engineering (IJCE)*, Volume 3, Issue 4, June-July 2014, pp. 47-56
8. Kumar, S. Mondal, A. N., Gaikwad, S.A., Devotta, S, Singh, R.N.(2004): *Qualitative Assessment of Methane Emission Inventory from Municipal Solid Waste Disposal Site: a case study*. *Atmospheric Environment*, 38, 4921-4929.
9. Lim, J.S and P. Missions (2003) *Does size really matter? Landfill Scale Impacts on Property Values*, Unpublished Working Paper, Department of Economics, Ryerson University, Toronto.
10. Mundy, B.( 1995) "The Impact of Hazardous Materials on Property Value". In: Jaffe, A.J (ed.) *The Real Estate Reader*, Cambridge, Blackwell Publishers.
11. Nelson, A. C., Genereux, J. and Genereux, M. (1992). *Price Effects of Landfill on house Values*. *Land Economics*, 68, 350 – 65. Published by University of Wisconsin Press stable.
12. NEST, (1991): *The Nigerian Threatened Environment: A National Profile, of the Nigerian Environmental Study/Action Team* Ibadan.
13. Ogedegbe, P.S. and Oyedele, J.B. (2006): *Effect of Waste Management on Property Values in Ibadan, Nigeria*. *Journal of Land Use and Development Studies*, Vol. 2, No.1.
14. Oluwande, P.A (2002) "An Overview of Urban Solid Waste Management in Nigeria." A paper Presented at The Workshop on Waste Disposal Environmental Pollution and Community Health, Industrial Unit and Technology. University of Ibadan 13-16<sup>th</sup> June.

15. Ossai, R. M. (2006). *Moving Solid Waste Management into the 21<sup>st</sup> Century in Nigeria. A paper Presented at the 6<sup>th</sup> National Council Environmental Meeting held at Katsina State Secretariat, Katsina, 13<sup>th</sup> – 17<sup>th</sup>, November, 2006.*
16. Nitish Puri, Jagdish Chand & Aditya Agrawal, *Engineering Properties of Highly Compressible Clay Stabilized with Pozzolanic Wastes, International Journal of Civil, Structural, Environmental and Infrastructure Engineering Research and Development (IJCSEIERD), Volume 3, Issue 5, November-December 2013, pp. 199-208*
17. Reichert, A. K.; Small, M. & Mohanty, S. (1992). "The Impact of Landfills on Residential Property Values". *The Journal of Real Estate Research*, 7, 297 – 314.
18. Wokekoro, E. and Uruesheyi, L. (2014). *Impact of Open Waste Dumps on Rental Values of Residential Properties in Port Harcourt, Nigeria. International Journal of Science and Research*, (3)3, 226-230.