

Monetary Implication of Environmental Disamenities on Housing Investment in Lagos State: The Ojota Scenerio

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Abstract Numerous studies have ascertained the diminutionary tendencies of disamenities such as solid waste landfills on real estate investments despite previous mixed conclusions. This study examines one of the four landfills in Lagos State- Olusosun landfill located in Ojota, Lagos and its estimated financial implication on the real estate market in Lagos State, Nigeria. A relational distance of 1 200m radius was established between the landfill and residential properties by which property values were measured based on consistent intervals of 300meters up to 1 200 meters in concentric rings. The study indicated within the Olusosun landfill neighbourhood, an increase in property values were evident as distance away from the landfills increased indicating that residential houses in close proximity to the landfills suffered value loss. Property appreciation relative to distance averaged 6% within the concentric rings of the landfill while the an estimated total loss on the real estate market via the landfill found to be approximately =N=2.1billion. The study recommended that if improved technology could not be utilised in the effective management of the various sanitary landfills within developed areas of the state, the current landfills in operation be closed down and relocated to the outskirts of the city to forestall a consistent appreciation in real estate investment in the state.

Keywords: Landfill, Distance, Residential Property, Property Value & Monetary Loss.

1. Introduction

Investing in real estate involves the purchase, ownership, management, rental and or sale of real estate for profit. Real estate as an asset is an embodiment of rights with limited liquidity relative to other investments. It's cash flow generative nature makes it the favourite investment of able and wealthy individuals inclusive of organisations and institutions. Capital for real estate investing are most times accessed at a cost, through mortgage leverage, cooperative societies and or personal savings overtime. In Nigeria, the goal of every able bodied man is to own at least an enclosure (shelter) he can call his own for himself and his family thus, there is a high drive to build, to own and to generate secured cash flows as a means of income from real estate.

Since real estate assets are typically very expensive to acquire/produce in comparison to other widely available investment instruments such as stocks and bonds, its appreciational potential must be harnessed and sustained optimally in a bid to secure a steady income stream for the investor. In line with the trinity of investment- security of capital, security of present returns on capital and security of future incomes are crucial requirements for an investment to be termed "ideal". Inclusively, every factor attributable to enhanced real estate value must of necessity be favourable to an investor's choice of real estate investment. These factors of which location is chief include neighbourhood amenities, accessibility, building finishes, nature of structure etc. The presence of value depressants such as landfills also terned a disamenity within the locality of

a real estate have been known to erode its potential to optimally generate income and also its open market value.

Facts have continually been established via researches that operational landfill within cities birth negative externalities which include but not limited to environmental stigma and damage through the formation and accumulation methane gas, groundwater contamination, bad odours, vermin and flies, while litters may spread from the landfill if not properly managed. In addition, the covering and compacting of the solid waste with soil suspends airborne dust which have proved hazardous to the health of neighbouring residents and passer-by as well. The economic impact of landfills on proximal values is important for a number of reasons. Foremost, a disparity in price between similar properties located in non landfill neighbourhoods and those within a landfill neighbourhood is created. Furthermore, affected real estate investors want to know what effect, if any, the presence of a landfill has or will have on the value of their assets. Likewise, in the event of a landfill project being subject to cost-benefit analysis, estimates of property price effects can be incorporated into the cost-benefit profile. Earlier researches on the impact of sanitary landfills on residential properties have found negative relationship between residential house prices and proximity to landfills. These studies indicate that values of residential properties situated within a six kilometre radius from any prominent landfill site rise by approximately 5 to 7% per 1.6 km distance away from the said site. Negative value effects have been rarely found for properties located in excess of six kilometres away from landfills. Property values, however, fall more dramatically (i.e. between 21 and 30 percent) the closer (i.e. in a 400m to 800m radius) the properties are situated to a landfill site. A few recent studies, however, have found no statistically significant relationship existing between house prices and proximity to modern landfills.

Currently, this attempt employs a quantitative approach in ascertaining the financial loss accrueable to the Ojota resident property market via the Olososun landfill. Section 2 presents previous studies on sanitary landfills and the the subsequent section discusses data collection and research methods utilised in the current study. Section 4 describes the data analysis and discussion employed in the study. Research findings were dealt with in section 5 while Section 6 recommends feasible solutions geared at abating landfill diminutions in the real estate market. Lastly, section 8 concludes the study.

2. Previous Studies on Sanitary Landfills

American literature have for long indicated that sanitary landfills negatively impact residential properties as far back as 1971. One of such foremost studies in this field of knowledge (Havlicek, Richardson and Davies 1971) found an increment in house pricing by \$0.61 per foot of distance from landfills in Fort Wayne, Indiana. The same results were obtained for landfills in Minnesota (Nelson et al 1992, 1997), Baltimore (Thayer et al 1992), Columbus, (Hite et al 2001), and Toronto (Lim and Missios 2003). Gamble et al (1982) estimated hedonic pricing regressions for house sales near a landfill in Boyertown in Pennsylvania. The purpose was to determine the extent of impact the landfill had on surrounding property values. When the distance was split and separate regressions estimated by year of sales, the estimated coefficients for distance to the landfill were not statistically significant at the 5% level of confidence. One of the estimated implicit prices was even negative implying higher prices closer to the landfill. This result was later cited by Cartee (1989) and Parker (2003) as evidence that modern landfills need not have negative impacts on property values. Though it could be argued that the modern landfill in this context must have incorporated certain inherent qualities that helped lessen the environmental effects of the landfill. Also, the span of the distance split in the above study was not specified so as to show the magnitude of the impact. This present research would address the gap by adopting 1.2km radius of the concentric ring to measure the impact of the landfill on value. A linear regression model would be employed at 95% degree of confidence.

Havlicek, Richardson and Davies (1985) analysed 182 single family house sales between 1962 and 1970 surrounding four landfills in the Fort Wayne, Indiana region. Their variables of interest were both the linear distance of residential properties from the nearest landfill and the deviation (in absolute degrees) from the prevailing downwind direction from the landfill. Both the distance and the wind variables were of the hypothesised sign and were significant at 5% confidence level. Their results indicated that for each degree away from downwind, the value of the house increased by about \$10.30 and for every thirty centimeter of distance away from the site, price increased by about \$0.61 in a linear fashion. Residents signified their preparedness to pay for more when asked how much more they would be willing to pay for an identical house located a kilometer increment further away from the hazardous waste site. The above study is significant to the current study because the distance variable was a common factor central on both studies. A small sample size of 182 single family house sales was adopted for analysis whereas a larger sample size of 2 341 has been adopted in the current study. Also, the choice of residential properties as a focus of research introduced a degree of similarity. However, while Havlicek, Richardson and Davies (1985) adopted a linear distance of 1 mile or 1.6 kilometers in their study in a developed country, the present study has adopted 1.2kilometers in view of the fact that in Lagos, the overall pattern of development does not exhibit a well laid out plan like developed countries. One major outstanding feature of their study was the rigour of not only splitting the distance into centimeters, but also ascribing values to residential properties near the landfill. The distance gradient relationship adopted in the current study was 300meters to a maximum of 1 200 meters both in linear form and concentric rings.

Cartee (1989) specifically embarked on a study to consider whether sanitary landfills had any adverse effect on community development and residential property values, and if so, measure their magnitudes in selected areas of Pennsylvania. Ten sanitary landfills operating under permits from the Department of Environmental Resources in Pennsylvania were selected for the study. The sanitary landfills were selected based on the presence of residential development in the surrounding communities. The objective was to measure the effects of the landfills on community developments and residential property values. "Study areas" were defined as delineated as those around one mile of the landfills. Four randomly selected areas, each one-half mile in diameter, located three miles away from each landfill site constituted the "control areas". Several types of data were collected for the landfill and control areas. These data included the number of properties by size, class, dates of new residential building and proximity of properties to the landfill with respect to three distance zones. For properties purchased from 1977 to 1981, several other house, lot and locational characteristics were also studied.

The study used multiple regression technique to measure the effect of landfills on residential property values. Regression results showed that in 1977 and 1979, the landfill had no discernable effects on residential property values. In 1978, the "distance to the landfill" variable was significant at 5-10% level of confidence. This suggests that distance variable was strongly intercorrelated with some other variables. The outcome of the research showed that different sets of property characteristics and different functional forms led to the general conclusion that things other than proximity to the sanitary landfill were more relevant to explaining property values. It can be deduced from the study that the real estate markets are dynamic and local in many respects. Also, landfills are rather heterogeneous varying in size, visibility, accessibility and appearance and that these intervening variables could affect study conclusions.

Reichert, Small and Mohanty (1991) examined the effects of proximity to five municipal landfills in Cleveland, Ohio in the United States. The semi-rural towns studied were Belchertown, Hudson, Ware, Clinton, Pepperrell and Leicester, all located in Central and Western Massachusetts, which had, landfills with varying sizes, operational status and history of contamination. Using Ordinary Least Squares, inflation adjusted housing prices were regressed upon the series of variables derived from previous studies. Regression results indicated that only one landfill (Pepperrell) had a significant negative impact on property values. Although this particular landfill was closed, it was unlined and uncapped, and the fact that the landfill was on

the US EPA's "potential health risk" list might have contributed to its visibility in the community. Extrapolated results showed that a typical house located half a mile from the landfill experienced a 6% rise in property value, while the same increased in value by one percent when located two miles away. This six percent differential for a house valued at \$120,000 (the average value for the study) was \$7,200. However, in respect of Hudson, Ware, Clinton, Pepperell and Leicester, no statistically significant effects were found. The reason could be that these effects did exist but were not detected in the study or possibly of the small sample sizes drawn on each of the landfills. Overall, the study did not provide grounds for broad generalisation about the effects of rural landfills on property values. It cannot be said that large landfills affect property values more than small ones as Hudson was the largest landfill studied and its effect was statistically insignificant. Open landfills do not affect values more than closed, as Hudson and Ware were still operating and show no significant effect. Landfills which seem to pose a threat to human health may affect property values more than others: Pepperell was on EPA's list as potentially posing a threat to human health. If the depreciation of local property values around the landfill was a concern of town officials, it seems that the best course of action would be to keep the landfill as clean and policed as possible.

In a more relevant study, Nelson et al (1992) studied the effect of a Ramsey, Minnesota landfill on 708 house sales between 1979 and 1989. Their dependent variable was residential property sales' prices, while distance from the landfill, age of house, number of bedrooms and bathrooms were also included as independent variables. The author found that the two landfills had a negative effect on single family house values for homes within 2 mile radius. The study showed that a home located at the boundary of the landfill could suffer a reduction in value of more than 12% while the value of a property located at one mile radius from the landfill could decrease by an estimated property gradient of 6.2%. The result of this study contrasts with Gamble et al (1982) who found no negative impact resulting from proximity of residential houses to landfill. Nelson, et al (1992) adopted 2 miles as the maximum distance.

Bouvier et al (2000) estimated hedonic regression for houses located near six landfills in Central and Western Massachusetts, two of which were open and active during the study period. The six landfills differed in size, operating status and history of accumulation. The effect of each landfill was estimated by the use of multiple regressions. In five of the landfills, no statistically significant evidence of an effect was found. In the remaining case, evidence of an effect was found, indicating that houses in close proximity to this landfill suffered an average loss of about 6% in value. Also, for two of the landfills, the estimated Marginal Implicit Price (MIP) of distance was positive for one distance and negative for the other, but statistically insignificant for both cases. It was observed from the study that the estimated negative coefficient had high sampling variability due to small sample size. The small sample size had thereby introduced some degree of unreliability in the result obtained. The study however established an empirical relationship between residential property values and proximity to a landfill or set of landfills. Cambridge Econometrics et al. (2003) conducted economic study of house prices around landfill sites in the United Kingdom that was undertaken as part of a landfill tax review for the Department of Environment, Food and Rural Authority (DEFRA). The study provided additional evidence of an association between proximity to landfill and wealth. The study looked at over half a million sales of houses situated near 11 300 U.K landfill sites and found that those properties sited within half a mile of a landfill site suffered statistically significant disadvantages. The value of houses situated less than a quarter of a mile away from the landfill site were an average of £5 500 lower than the value of a similar house not situated near a landfill site. For those houses over a quarter of a mile from the site but under half a mile, the fall in the property value was an average of £1 600 and less than a quarter of a mile saw a fall of 40%. Even within the U.K, there were significant regional disparities with the most marked effects in Scotland, where areas in closest proximity to the landfill site (disadvantaged socio-economic groups) may migrate to areas near hazards to take advantage of lower housing prices. This development as shown in the study by Reichert et al (1991) is characteristic of landfill neighbourhoods because as

vacancy ratio increases due to the flight of most residents, people of low class take advantage of this to pay lower rent. The distance-value gradient used in the above study would be employed in the current study using concentric rings with the maximum of 1 200 meters.

Similarly, Adewusi and Onifade (2006) focused on the effect of urban solid waste on physical environment and property transactions in Surulere Local Government Area of Lagos State. Questionnaires were randomly administered on residents and firms of estate agents to gather data on the subject matter. Data obtained were analysed 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. However, the study did not monetary explicit on the change in values.

In the same vein, Bello (2007) used multiple regression analysis to determine the effect of waste dumpsites on property values in Olusosun neighbourhood at Ojota, Lagos State. The study found that property values increase with distance away from dumpsites. Also, 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 waste water disposal, water and electricity supplies, neighbourhood 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 neighbourhoods in Akure, Nigeria. He combined multiple regressions and predictive model to determine property values as a function of housing attributes and logistic model as 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 residents willingness to pay for both structural as well as neighbourhood characteristics where the real estate is located. However, Bello and Bello (2008) failed to relate property values with distance from the waste dump site as an environmental disamenity. This present study fills this gap.

Bello (2009) carried out a study on the effects of waste dump sites on proximate property values in Lagos, Nigeria using three dump sites located at Olusosun, Abule Egba and Solous adopting 1km distance measurement to assess the effects of the dumpsite on the neighbourhoods. The research sampled 334 residents from the three waste dump sites and 107 Estate Surveying and Valuation firms in metropolitan Lagos. The study was in the main to measure the effect of waste dump on property values and to develop an appropriate valuation methodology to carry out valuation of properties affected by waste dump sites. A combination of valuation methodologies was adopted such as Paired Sales Analysis, Contingent Valuation Analysis, Option Pricing Model and Hedonic Approach. The study found that there was a weak linear relationship between rental value and satisfaction of occupants in the neighbourhood of the waste dumps.

In Akinjare et al. (2011), the impact of four operational sanitary landfills (Gbagada, Olusosun, Abule-Egba and Solous) on proximal residential properties in Lagos metropolis of Nigeria was studied using a sample size of 2 341 residents. Inclusively, 229 Estate Surveyors and 315 Lagos State Waste Management Agency (LAWMA) officials provided data for the study. Evaluation using a hedonically derived regression function in analysing data estimates drawn from administered questionnaires showed a slight evidence of statistical significance indicating that all residential property values increased with distances away from landfill sites at an average of 6% for the four landfills. Similarly, in another study Akinjare et al (2011), the price effects of landfills on residential housing in Lagos, Nigeria was determined using all four landfills in the Lagos metropolis. Using concentric rings, there was an indication that the highest property values were recorded for properties between the 601m and 900m range from the landfill. There was no threat posed by the landfill to properties beyond the 900m concentric ring. Also, the study showed that 30.2% of residential properties were situated within the 601m and 900m distance range from the landfills while 41.4% of residential properties were situated between 901m and 1 200m boundary. This study established that there is a negative correlation between landfills and proximal residential property values within the 300 meter demarcated concentric

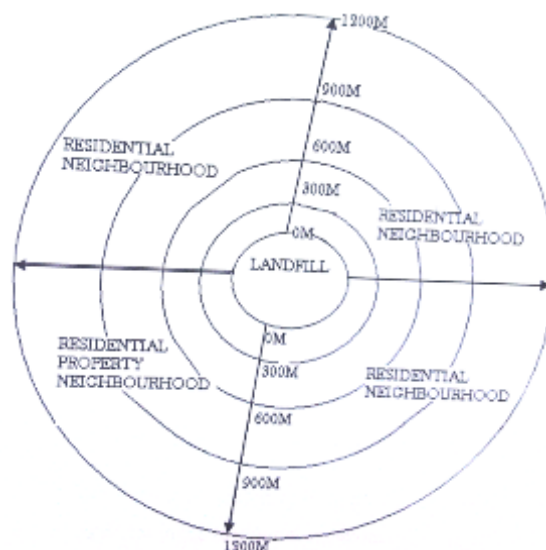
rings extending to 1.2km. The study failed to indicate the estimated aggregate loss in value of investors real estate within the immediate residential scope of 1 200m from the four landfills. This current study fills this gap by estimating the aggregate monetary loss created by the Olusosun landfills in its immediate residential neighbourhood.

In line with the aforementioned studies, this current study attempts to determine the relationship between distance from Olusosun landfill and aggregate monetary loss in neighbourhood residential property values. Obtainable results will form a good basis for understanding property market behaviour and consequently draw a comparison between past studies and the current one for the purpose of empirical generalisations. The present study relies on relative distance from Olusosun landfill as a variable to measure its impact on residential property values in within the Ojota property market. The essence is to estimate and appreciate the value loss in real estate within 1 200m of market of Olusosun landfills.

3. Data Collection and Research Methods

Questionnaires were distributed to Estate Surveyors and Valuers, residents within 1.2km of the Olusosun landfill neighbourhood as well as officials of the Lagos State Waste Management Agency (LAWMA). The survey involved every third houses within 1.2 km distances from the landfill site. The responses from residents around Olusosun amounted to 674. Also, 229 Estate Surveyors and 315 Lagos State Waste Management Agency officials returned questionnaires administered to them. The survey recorded an average response rate of 78% and the collated primary data were analysed using a descriptive and analytical statistics. Since the impacts of a landfill on nearby residential property values are not expected to be uniform as ascertained by literature, values are expected to increase with distance away from the landfill, the concentric ring model was then used in analysing landfill impacts on residential property values.

Figure 1. Distance-Value Gradient in Concentric Rings.



Source. Author's Construct, (2010)

The relationship between landfill and property value was measured in a distance of 1.2km radius away from Olusosun landfill location. Measurement was based on interval of 300meters up to 1 200 meters in concentric rings aiding the computation of the landfill's impact on neighbouring residential property at specific and varying distances in Nairage value.

4. Data Analysis and Discussion

Information gathered were analysed as shown in Tables 1 – 4. From Table 1, it is observed that

while the various type of residential properties around the Olusosun landfill location increases as the distance away from the landfill increases, property values of various residential properties increase outwardly. The analysis of Table 1 revealed that 4.5% of the houses were located within 0-300meters, 17.5% were within 301-600 meters, 32.6% located within 601-900m and another 45.4% located within 901-1 200 meters. Total monetary value for each category of property was also computed within each concentric ring as shown by the Table 1.

Table 1. Cross-Tabulation of Mean Property Values and Distances of Properties Within 1 200m Radius of Olusosun Landfill (=N=000,000.00)

Dist. (m)	Residential Property Type															No of Ppties	% of Total
	Tenement House			4nos, 3b/r Flats			4b/r Duplex			4b/r Detached + b/q			5b/r Detached + b/q				
	F	P.v	F.pv	F	P.v	F.pv	F	pv	F.pv	F	p.v	F.p.v	F	p.v	F.pv		
0-300	0	2	0	8	4.5	36	8	6	48	5	6	30	9	7.5	67.5	30	4.5
301-600	12	2.5	30	34	6.5	221	31	8	248	25	8	200	16	9.5	152	118	17.5
601-900	30	4	120	58	8	464	69	10	690	31	11	341	32	10.5	336	220	32.6
901-1200	62	4	248	72	9	648	63	11	693	59	11	649	50	11	550	306	45.4
Total																674	100.0

Source: *Statistical Analysis, 2009*

Table 2 analyses the estimated total value for each property type within the various concentric ring. Total real estate investment within 1 200m radius was estimated at =N= 5.772 billion. Tenement housing within the 1 200m landfill neighbourhood which was the least accounted for 6.9% of total real estate investment while the four bedroom duplexes constituted the highest form of residential investment (29.1%). The table also showed that 23.7% of total real estate investment were 4nos 3bdrm flats, 21.1% were 4b/r Detached + b/q while the remaining 19.2% were 5b/r Detached + b/q within the 1 200m landfill neighbourhood.

Table 2. Estimated Investment in the Residential Real Estate Market Within 1 200m of Olusosun Landfill (=N=000,000.00)

Property Types	Property Values Across the Concentric Rings (F.pv)				Total	% of Total
	0-300m	301-600m	601-900m	901-1 200m		
Tenement House	0	30	120	248	398	6.9
4nos, 3b/r Flats	36	221	464	648	1 369	23.7
4b/r Duplex	48	248	690	693	1 679	29.1
4b/r Detached + b/q	30	200	341	649	1 220	21.1
5b/r Detached + b/q	67.5	152	336	550	1 105.5	19.2
					5 771.5	100.0

Source: *Statistical Analysis, 2009*

Table 3 analyses the impact of Olusosun landfill on adjacent and neighbouring properties within the 1 200 meter radial perimeter and a consistent pattern of residential property distribution is

observed. The number of residential properties increase as distance away from the landfill increases. Using the present value (PV) of similar residential properties in non landfill areas of Ojota, the loss in value of individual units of housing were computed and aggregated across the various concentric rings. Property values losses within the concentric rings were as follows: =N=218.72million value loss within 0-300m radial diameter, =N=419million value loss within the 301-600m ring, =N=454.48million value loss within 601-900m range and =N=390million value loss within 901-1 200m. In total, a value loss of =N=2.091billion was ascertained to be eroded off the residential property market of Ojota due to the presence of Olososun landfill.

Table 3. Cross-Tabulation of Mean Property Values and Estimated Aggregate Monetary Loss in Real Estate Investment within 1 200m Radius of Olusosun Landfill

Property Type	Olusosun Residential Neighbourhoods (=N=000,000.00)													
	PV of Residences in Landfill Areas				PV of Residences in Non Landfill Areas	Difference in PV of Residences between Non landfill & Landfill Areas								Agg. Loss in Real Estate Investment
	0-300m	301-600m	601-900m	901-1200m		0-300m		301-600m		600-900m		901-1 200m		
						F	pv	F	pv	F	pv	F	pv	
Tenement House	2	2.5	4	4	5.93	0	3.93	12	3.43	30	1.93	62	1.93	
4nos 3bdrm flats	4.5	4.5	8	9	10.0	8	5.5	34	5.5	58	2.00	72	1.00	419.00
4bdrm duplex	6	8	11	11	12.88	8	6.88	31	4.88	69	1.88	63	1.88	454.48
4bdrm Detached + b/q	8	8	11	11	13.50	5	5.50	25	5.50	31	2.5	59	2.50	390.00
5bdrm Detached + b/q	7.5	9.5	10.5	11	16.03	9	8.53	16	6.53	32	5.53	50	5.03	609.71
Total														2,091.91

Source: *Statistical Analysis, 2009*

Again, the analysis of Table 4 vividly indicates the variance between the mean values of the various cadre of residential properties within the 1 200 meter radial confines of the Olusosun landfill and also, the mean values of similar properties outside the 1 200m radial confines of the landfill. The percentage increase in value is presented with tenement housing having the highest value increment of 89.5% while the cadre of 4 bedroom detached houses ranked the least with a value increase of 42.12%. A 66.46% increase in residential value was attributable to the 5bedroom detached +b/q cadre, 43.11% incremental value to the 4bedroom duplex housing cadre while 53.85% increment in value was accrued by the 4nos 3bdrm flats cadre.

Table 4. Mean Values for Various Residential property Types Within and Outside 1 200m Radius of Gbagada Landfill Neighbourhood

Location	Gbagada Non Landfill Residential Neighbourhood in (=N=000,000)			
Property Type	Landfill	Non landfill	Diff in Value	% Increase.
4nos 3bdrm flats	13.83	16.3	2.47	17.86
4bdrm duplex	14.11	17.4	3.29	23.32
5bdrm Duplex+ b/q	19.73	23.8	4.07	17.64
5bdrm Detached+ b/q	14.94	25.3	10.36	30.95

4bdrm Detached+ b/q	17.54	22.5	4.96	31.37
3bdrm Duplex+ b/q	14.2	16.6	2.4	16.18
Tenement House	4.1	8.8	4.7	51.22

Source: *Field Survey, 2010*

Lastly, Table 5 presents a summary of the study's findings. An estimated =N=5 771.5 billion worth of residential investment was deduced as the present value of Olusosun landfill neighbourhood (within 1 200m radii confines) and a total loss of =N= 2 091.91billion in value was also indicated and attributable to the nearby Olusosun landfill. Without the landfill, the Table estimates the neighbourhood value of Olusosun in the region of =N=7 863.41. This vividly shows the enormous diminution in the real estate market of Ojota caused by its disamenity.

Table 5. *Summary of Residential Neighbourhood Values Across Olusosun Landfill Location =N=(000,000.00)*

Estimated Value of Olusosun Residential Neighbourhood (With Landfill)	Aggregate Loss in Real Estate Investment.	Estimated Value of Olusosun Residential Neighbourhood (Without the landfill)	% Property Value Appreciation Away From Landfill
5 771.5	2 091.91	7 863.41	6

Source: *Statistical Analysis, 2009*

5. Research Findings

Across the Olusosun landfill neighbourhood, the survey revealed that an increase in property value was evident as distance away from the landfill increased. The results of both Tables 2,3 & 4 estimates the worth of the study area without Olusosun landfill at =N=5 773.59 billion. A huge monetary loss of =N=2 091.91billion was ascertained to be in existence within the landfill neighbourhood, therefore, without the landfill, Olusosun property market would have estimated =N=7 863.4billion. There was an indication that the highest property values were recorded for properties within the 601m and 900m range from the landfill. There was no threat posed by the landfill to properties beyond the 900m concentric ring. Also, the study showed that 32.6% of residential properties were situated within the 601m and 900m distance range from the landfill while 45.4% of residential properties were situated between 901m and 1 200m boundary.

Furthermore, the study suggested that in order to mitigate the adverse impacts of the landfill on residential property values, amenities such as health centers, bore holes, street lighting facilities in a bid to enhance these plagued neighbourhoods.

6. Recommendations

The study recommends that instead of Government turning burrowed pits into landfills, the site selection criteria as enuciated by Luthbom and Lagerkvist (2003) with respect to distance between landfills and settlements, occurrence of surface water, ground water, ecological and hydro geological conditions on and around the site, existing and pending laws and regulations and transport systems and communications should be considered exhaustively. Despite governments efforts at environmental sustainability presently, it is recommended that if improved technology can not be utilised in the effective management of the various sanitary landfills within developed areas of the state, the current landfills in operation be closed down and

relocated to the outskirts of the city to forestall a consistent appreciation in real estate investment in the state. This would preserve the present and future values of borrowed and hard earned scarce capital in form of real estate. There is also an urgent need for the formulation of suitable action plans and education of the grass root by LAWMA in order to improve waste management and projection in the nearest future. There is the need to expand recycling programmes through modern methods with a view of turning waste to wealth in metropolitan Lagos.

Finally, the support of the private sector and NGOs is also required most especially in the area of organising maintenance workshops and enlightenment programs which should include the grassroots participation and input.

7. Conclusions

This current study has established that there is a negative correlation between landfills and proximal residential property values within the 300 meter demarcated concentric rings extending to 1.2km. It is therefore, hoped that if the Lagos State Government is able to look into the recommended solutions, individual and institutional real investment holdings financed by bank loans and its likes would continually appreciate in value vis-a- vis an improved environment. By this, the value of investments in real estate would be sustained on a general scale in Lagos State.

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