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Perception of Disamenity Hazards on Residential Housing Values in Lagos, Nigeria

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ABSTRACT

Landfill disamenities have been known to poison and threaten the natural environment with various degrees of contaminations and hazards ranging from air contamination to property diminutions. This current study identifies and evaluates the various environmental contaminants and hazards attributable to the four official landfills in Lagos State via perception. A total of 229, 2 341 and 315 structured questionnaires were administered to Estate Surveyors and Valuers, residents living within 1.2km distance from the four landfill sites and Lagos State Waste Management Authority (LAWMA) workers respectively and on the average, 78 percent were retrieved. Data analysis showed that residents living within 1.2km distance the landfills identified the most outstanding hazards detrimental to the environment and human health as poisonous odour, truck traffic, stigma, noise pollution and threats of insects, pests and rodents. The study suggested closing down of all four operational landfills sited within residential areas and also a stern discouragement of illegal dumpsites. It recommended establishment of new landfills which should run on latest technology to avert pollution and also be sited in uninhabited sites out of town. This as the study envisaged would reduce to barest minimum, landfill hazards and nuisance both to the environment and man.

Keywords: Landfill, Environment, Hazard, Nuisance, Pollution and Estate Surveyors and Valuers.

Paper Type: Research Paper

INTRODUCTION

The purpose of this study is to evaluate the hazards of sanitary landfills on residential housing as perceived by residents and Estate Surveyors and Valuers in Lagos, Nigeria. Lagos State being highly industrialised with a projected average population of between 12-18million persons, utilises 20-25% of its funds on waste management (Thomas 2000). This invariably fostered a total breakdown in solid waste management in the late 80s even until 1999 as previous military administrations in the state failed to meet acceptable standards. The result of this was not only injury on real estate value but also, severe injury on the immediate and distant environment (Ogedegbe and Oyedele 2006).

The establishment of four official landfills in Gbagada, Olusosun, Abule-Egba, and Solous to a large extent promoted environmental aesthetics and health in most parts of the state while condemning property investors and residents in close proximities to these landfills to the detrimental environmental damage of these disamenities. The environmental effects and damage caused by these landfills and dumps such as the accumulation of methane gas resulting to fires, underground water contamination, pungent stench and the heavy presence of rodent within landfill neighbourhoods posed severe threat to the health and well being of the immediate residents despite its diminutionary effect on property value. Therefore, the evaluation of hazards posed by these landfills on their immediate and distant environment cannot be over looked vis-a-vis its impact on the residents. It is thus the aim of this study to evaluate the environmental hazards impact these landfills constituted to the environment of Lagos metropoli.

The Microsoft Encarta Dictionary (2009), defines hazard as “something potentially very dangerous or a dangerous and unwanted outcome.” Different authors have defined and viewed hazard in various perspectives. Kates & Kasperson (1983) view hazards as a threat to humans and to things they consider valuable. Similarly, Deyle et al. (1998) defined hazard as an extreme event that poses risk to human settlements while Alexander (1993) regarded hazard as the exposure to some risk of disaster in the pre-disaster situation, due to the presence of human population in hazard-prone areas. Burton and Kates (1964) refer to natural hazards as “elements in the physical environment, harmful to man and caused by forces extraneous to him”. According to Deyle et al. (1998), consequences of harmful impacts of hazards include direct effects (injuries, deaths, health problems, and damage to personal property, public facilities, equipment, and infrastructure), and indirect effects (loss of jobs, business earnings and tax revenues, losses caused by business and production interruption, and the public costs of all phases of hazard adjustment). Invariably, the term “environmental hazard” implies the existence of a potentially dangerous entity acting as a contaminant in the environment. Such entities or “contaminants” therefore have capacity to interact with the environment to produce unwanted outcomes in the ecosystem. Inevitably, environmental quality is endangered at the expense and existence of hazards which could take the form of man made disamenities in the immediate locality. Environmental disamenity such as Landfills and other associate facilities have for sometime been thought to act as a major facilitator of potential dangers on the environment observers have noted.

Carrol et al (1996) claimed that real estate values declined following a major environmental mishap by studying the before and after impact of June 27, 1988, Pepcon Chemical Plant explosion in Henderson, Nevada, and the subsequent decision to relocate the plant 100miles away

from the original location. Following the plant's explosion, an 18% reduction coefficient was observed, but local real estate prices rebounded by 38% when Pepcon announced that the plant would be relocated. Comparisons indicated that the discrete distance from the plant's model produced better results than the continuous – distance quadratic model. While the above study considered before and after impact, the current study only considers the impact of landfills on property values during their existence.

Research on public perceptions of the risk associated with the toxic and hazardous contaminated sites have been carried out by various authors (McCluskey et al., 2001, T Gayer, 2000, Gayer et al. 2002). Gayer et al. (2002) in his study of the effect of cancer risk perceptions from Superfund sites on house prices in the Grand Rapids, Michigan found that people are willing to pay more for houses exposed to lower levels of Superfund cancer risk and residents' willingness to pay to reduce risks decreased after the assessment was released. This was conducted before and after the Environmental Protection Agency (EPA) released its assessment of site risks. Total cancer risk was also found to be the sum of cancer risk from soil and groundwater contamination at each of the Superfund sites.

Also, McClusky et al. (2001) in their study, analysed the impact of perceived risks on property value. The study ascertained that perceived risk had a negative relationship with house prices and media coverage increased perceived risk. In this context, perceived risk was assumed to be a function of lagged perceived risk and media coverage of the hazardous waste sites in Dallas County, Texas.

Hwang (2003) investigated the effects of Scientifically Estimated Environmental Risks (SEER), the perceived risk of floods, hurricanes and hazardous material releases (EPA Toxic Inventory Release Data) and hazard mitigation measure along with other locational and neighbourhood amenities on housing prices. He used a mail survey to obtain his pricing and consumer attitude data along with market values estimated by Harris County Appraisal District for the basis of his hedonic model to regress the dependent variables of estimated housing values against structural characteristics, neighbourhood characteristics, locational characteristics, city, hazard mitigation activities, SEERS, and risk perception. Since proximity to a Toxic Release Inventory (TRI) facility was significant at the 95% confidence level while the risk perception of floods and hurricanes was not, he concluded that people living near natural hazards such as floods and hurricanes were at greater risk to environmental hazards. Additionally, all the structural, neighbourhood and locational characteristics were statistically significant at the 95% confidence level. Landfill flooding is an environmental risk which is believed to be one of the causative factors for both surface and underground water pollution; consequently, it lowers nearby residential property values.

Wisinger (2006) in his research on the effects of Chemical hazardous sites on residential values in New York used hedonic model to test for correlation. The study found that housing values were lower near permitted Water Discharge Sites. Also, Wisinger further used regression analysis to determine if the role of terrorism could be analysed by comparing sales before September 11, 2001, (9/11) with sales after 9/11; it was established that the fear of potential terrorist attack on target public buildings lowered residential property values as in the case of

September 11, 2001. The study showed that there were other environmentally risky hazards other than landfill which impacted seriously on property values.

However, the attempt in this study was attempts to evaluate the hazards of landfills on residential housing within 1.2km distance from the landfill sites in Lagos, Nigeria. Obtainable results will form a good basis for understanding landfill hazards on neighbouring residents for the purpose of empirical generalisations.

MATERIALS AND METHODS

Primary data were collected through questionnaires distributed to Estate Surveyors and Valuers, residents within 1.2km to the four landfills as well as officials of the Lagos State Waste Management Authority (LAWMA). The study sampled every third houses within 1.2 km distances from the four landfill sites. The response is as follows; Gbagada –(848), Olusosun – (674), Abule-Egba –(422) and Solous –(397). In addition, 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 collected data were analysed using descriptive and analytical statistics.

Since the impacts of a landfill on nearby residential property values are not expected to be uniform as ascertained from 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.

The researcher also acknowledges major input from the unpublished PhD thesis of Dr. Cornelius Babatunde Omoogun in the Department of Estate Management, Covenant University titled: “The Impact of Municipal Landfills on Residential Property Values in Metropolitan Lagos” which where found useful and modified in the course of this study.

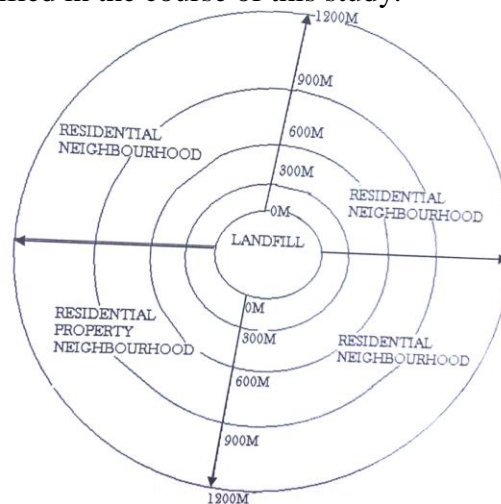


Figure 1 Job Involvement Terms: Distance-Value Gradient in Concentric Rings
Source: Author's Construct, (2010)

The relationship between landfill and property values was measured in a distance of 1.2km radius away from the landfill location. Measurement was based on interval of 300meters up to 1 200 meters in concentric rings.

RESULTS AND DISCUSSION

In an attempt at appreciating the residents' different levels of dispositions to the various environmental hazards associated with landfills, residents were asked to rate the various nuisance elements as perceived by them. The ratings so obtained are contained in Table 1. Table 1 bring into focus two distinct areas of analysis. The first contained the column dealing with resident respondents' percentage rating of the impacts of landfills on residential property values while the last column contained mean values of the ratings in absolute terms. In Table 2, ten potential hazard and health problems were rated by residents living within 1.2km radius of the landfills under this research. The results of the survey showed that the six major areas of nuisance and health risk were identified as the most crucial. Truck traffic constituted the greatest problem to the residents around the landfill sites as all respondents rated same as having high impact (100%). The next two significant hazard elements identified were air pollution and poisonous odour such that both recorded 96% respectively under high impact.

Table 1 Job Involvement Terms: Percentage Evaluation of Hazard Elements Of Landfill on Residents

	1	2	3	4	5
POTENTIAL NUISANCE	NO IMPACT	LOW IMPACT	MEDIUM IMPACT	HIGH IMPACT	MEAN RATING
Water Pollution	0	12	64	24	3.12
Air Pollution	0	0	4	96	3.96
Skin Irritation	4	4	80	12	3.1
Fear of Epidemics	0	8	64	28	3.2
Poisonous Odour	0	0	4	96	3.96
Stigma	0	0	28	72	3.72
Scavengers Threat	0	12	76	12	3.07
Noise Pollution	0	4	17	79	3.63
Truck Traffic	0	0	0	100	4
Blowing Trash	0	0	16	84	3.68

Source: Field Survey, 2010

Other major nuisance to residents include blowing thrash (84%), noise (79%) and stigmatisation (72%) as shown in high impact column. Skin irritation and scavengers' threat recorded 12% were of the least significant effect on the residents in landfill areas under study. Hence, they were not seen as important parameters when deciding to live around landfill sites. The hazard element arising from truck traffic had become more pronounced now that more fleet of waste trucks have been commissioned to stem up the frequency of waste collection in all the Local Government Council Areas. This in addition to other trucks licensed for the Private Sector programme (PSP) has increased tremendously the truck traffic especially in the four designated landfill sites.

While most of these trucks are waiting on queues to discharge their waste, the foul odour emanating from the stench tends to pollute the air even before it reaches its final location. The stigma effect attached to property in landfill neighbourhood is another area of concern to residents. Noise pollution around the landfill sites is usually associated with traffic noise arising from the blaring of automobile horns and honking when preparing to discharge their waste.

The survey reveals that four of the potential hazard impacts had low rating score but not without significant effect. For instance, fear of epidemics had a rating score of 3.2, while water pollution was rated with 3.12. skin irritation and scavengers threat were rated 3.1 and 3.07 respectively. From the data, all the nuisance and health challenges were potentially of negative impacts on property values and none of the areas of potential nuisance and health problems was having percentage ratings below 60%.

The study attempts to maintain a balanced view by asking Estate Surveyors and Valuers to rate the hazard elements as perceived by them. This was to corroborate the perceptions of residents in order to appreciate synchronisation or divergent views from both stakeholders. The perception of Estate Surveyors and Valuers is shown in Table 2. The table shows the hazard element perceived by Estate Surveyors and Valuer across the 4 landfill sites in metropolitan Lagos. Four major areas of hazard have been identified namely: Pollution, health hazards, stigma and truck traffic problems. Pollution problems were viewed from the point of surface and underground water pollution, air and noise while major area of health hazards associated with landfills were skin irritation, fear of epidemic outbreak, poisonous odour and the menace of rodents like rats and pests inclusive of insects such as mosquitoes and trash flies.

Table 2 Job Involvement Terms: Frequency Distributions of Hazard Elements Perceived by Estate Surveyors and Valuers.

Hazards		High (%)	Medium (%)	Low Impact (%)	No Impact (%)
Pollution	Water	60 (36)	90 (54)	9 (5)	8 (5)
	Air	113 (68)	39 (23)	15 (9)	0
	Noise	90 (54)	57 (34)	14 (8)	6 (4)
Health Hazards	Skin Irritation	39 (23)	69 (42)	50 (30)	9 (5)
	Epidemic	65 (39)	80 (48)	11 (7)	11 (6)
	Poisonous Odour	117 (70)	25 (15)	21 (13)	4 (2)
	Rodents	84 (61)	26 (19)	19 (14)	8 (6)
Stigma		88 (64)	35 (26)	4 (3)	10 (7)
Truck Traffic		85 (62)	37 (27)	12 (9)	2 (2)

Source: Field Survey, 2010

From Table 2, poisonous odour ranked highest with 70% level of impact on property values. Also, air pollution, stigma, truck traffic, insects pests and rodents and noise pollution had been identified as having the high impact on property values in metropolitan Lagos. Water pollution with 51%, fear of epidemics and skin irritation had been adjudged to have medium impact

according to the survey. Ranking the hazard elements therefore, poisonous odour (70%), air pollution (68%), stigma (64%), truck traffic (62%), rodents, insects, and pests (61%) and noise pollution (54%) were the critical impacts exerted on property values by the landfill sites.

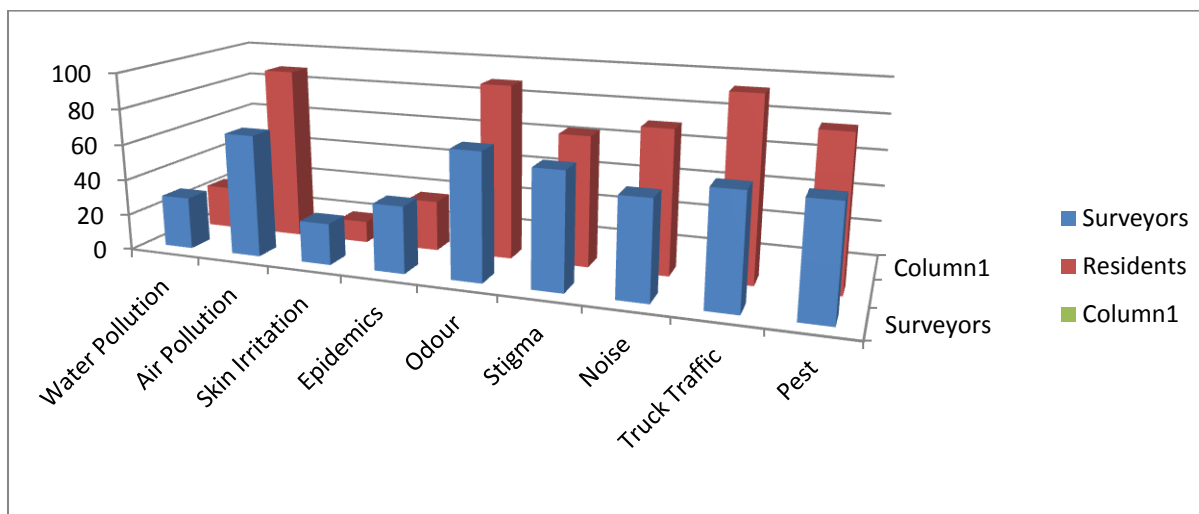
TABLE 3
Job Involvement Terms: Perception of Nuisance From Landfills by Estate Surveyors and Residents in Percentages.

Respondents	Water Pollution	Air pollution	Skin Irritation	Epidemics	Odour	Stigma	Noise	Truck Traffic	Rodents/ Insects.
Residents	24	96	12	28	96	72	79	100	84
Surveyors	29	68	23	37	70	64	54	62	61

Source: Field Survey, 2010

From Table 3, nine potential nuisance and health problems were rated by residents living within 1.2km radius of the landfills under this research. The results of the survey showed that 5 major areas of nuisance and health hazards were identified as most crucial. The composite table presenting the percentage rating of both parties was as shown in Table 3. The Table also displays in a concise form, the perception of each group as regard the nuisance elements. The ratings by residents appeared more realistic because they were directly affected overtime. Their perception had further being confirmed during the indepth interview conducted with resident associations.

Both residents and Surveyors had had ranked the potential nuisance associated with landfills. the six major sources of nuisance identified by the residents were truck traffic, air pollution and odour, noise pollution, stigma and pests while the six major sources of nuisance perceived by Estate Surveyors in a landfill neighbourhood were: Odour, air pollution, stigma, truck traffic, pests and noise pollution. From the table, it is apparent that the two groups had the same level of perception about the environmental impact of landfills. Both reports rated water pollution, skin irritation and fear of epidemics low, thus it had not been deemed to constitute serious threat to property values in any of the landfill sites. The different percentage level of hazard elements expressed by the Estate Surveyor and Valuers alongside residents is illustrated in Figure 2

Figure 2 Job Involvement Terms: Nine Major Sources of Hazards

CONCLUSION

The Olusosun landfill at Ojota being a cynosure of all eyes due to its strategic location deserves more government attention so as to reduce the level of environmental pollution arising from the fume and hail of flame causing air pollution. Locating landfills beside a major expressway should be discouraged. A landfill site without a perimeter wall does not speak well of government intransigencies to qualitative environmental management but gives the impression of filthiness characteristic of our environment. Government should therefore, as a matter of policy guidelines direct the fencing of all landfills as a way of meeting international standards.

This current study has established that the most outstanding hazard elements associated with the four landfill sites affecting the demand for housing around landfills and by implication, residential property values under this study were poisonous odour, truck traffic, stigma, noise pollution and threats of insects, pests and rodents. These observation has brought into focus those factors that hitherto may not have received much attention. It is therefore, hoped that if the Lagos State Government 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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