

# The Effect of Proximity to Waste Dumps Site on Rental Values of Residential Properties in Minna, Nigeria

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**Abstract-** *This paper examined the effect of waste dump site on rental values of residential properties in Tayi community in Minna, Niger State. Two sets of structured questionnaires were administered to property occupiers (Landlords and Tenants) and Estate Surveyors and valuers firms in Minna. Two hundred (200) from the residents and ten (10) from the estate surveyors and valuers. The research questions were analyzed with simple frequency and frequency table while a 5 point likert scale were used to examine effect of factors on rental values. The study has established that proximity to dump site (Abattoir) in the community have a significant negative effect on the rental values of residential properties as a result of the liquid waste disposed without proper management thereby creating air pollution in the study area which posed a serious health threat to the occupant in the community and Estate Surveyor and Valuer should advise their clients and dangers of living or locating their properties in close proximity to any dumpsite location. The Government should also create awareness programme for residents in these areas on its health implications of such locations and or provide a better way of managing the waste produced the study area.*

**Index Terms-** *Wastes, Dump Site, Environment, Property, Value*

## I. INTRODUCTION

### 1.1 Background to the study

The generation of waste is inevitable as long as mankind continually exists on planet earth (NEST, 1991). Waste is known as any solid or semi-solid material(s) which has been discarded by its principal users and may or may not be found useful by another person, but form a nuisance to the health of the people and the immediate environment when left untreated. Waste could be explained, to mean scraps, used products, whether solid or liquid having no economic value or demand and which must be thrown away (Isimirah, 2002). Disposal of waste has

been a serious 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 degree of urban waste comprising grave 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 (Ogedegbe and Oyedele, 2006).

Waste and its management is a global phenomenon connected with practically all human activities and it cannot be separated from life. Moreover, the snags of waste which contemporary progression produce are clearly related to the living standards, socio-economic and cultural attributes of that environment (Zurbrugg, 2002). Leton & Omotosho, (2004) referred to solid waste as waste which is neither liquid nor gaseous, generated through a variety of daily human activities and is ultimately regarded as not valuable. Solid waste could, therefore, be garbage, refuse, or sludge which is residues of liquid effluent. Hoornweg & Thomas, (1999) posited that solid waste streams could be illustrated by; their sources, type of waste (solid, liquid, or gaseous states) produced as well as generation rate and composition. They further grouped wastes into eight viz. residential, industrial, commercial, institutional, constructional and demolition, municipal services, process, and agriculture. In another light, Duan, Huang, Wang, Zhou, & Li, (2008) however perceives solid wastes as solid or semisolid materials resulting from human and animal events and they are useless, unwanted, or hazardous.

The study of Ogedengbe & Oyedele, (2006) revealed a change in the rate of municipal solid waste

quantities and composition in developing and developed countries is unparalleled. They said that the greater the economic prosperity and the higher the degree of urban population, the more the quantity of solid waste generated. This is due to constant lifestyles changes, the related conveniences and products such as mobile phones, electronics, polyvinyl chloride plastics, disposable diapers pose special waste disposal challenges.

The aim of this paper is to investigate the effect of proximity to waste dump site on real estate values in the Tayi village community in Minna. Tayi community is located in Bosso Local Government Area of Niger State. It houses the abattoir of the State capital where all kinds of animals are slaughtered daily. The community has witnessed enormous growth since the sitting of the abattoir in the community attracting many people both the from within the state capital and outside. However, these have serious implications of waste generation in the area. The area has witnessed the enormous environmental pollution and mishap due to the presence of the dump site caused as a result of the abattoir. Residents within the area complain of health issues and passers-by also complain of foul odors emanating from the dump site.

## II. LITERATURE REVIEW

### 2.1 Concept of Waste and its Management

Waste and its management is a global phenomenon connected with basically all human activities and it cannot be separated from existence. Moreover, the snags of waste which contemporary evolution produce are evidently related to the living standards, socio-economic and cultural attributes of that environment (Zurbrügg, 2002). Leton & Omotosho, (2004) referred to solid waste as waste which is neither liquid nor gaseous, generated through various daily human activities and is ultimately regarded as not useful. Solid waste could, therefore, be garbage, refuse, or sludge which are residues of liquid effluent. Hoornweg & Thomas, (1999) posited that solid waste streams could be illustrated by; their sources, type of waste (solid, liquid, or gaseous states) produced as well as generation rate and composition. They further grouped wastes into eight viz. residential, industrial, commercial, institutional,

constructional and demolition, municipal services, process, and agriculture. In another light, Duan, Huang, Wang, Zhou, & Li, (2008) however perceives solid wastes as solid or semisolid materials resulting from human and animal events and they are useless, unwanted, or hazardous.

Waste can be seen as any material or article which requires to be discarded of as being broken, worn out, contaminated or otherwise spoilt and reduction, recycling and waste transformation are methods widely used to manage such solid waste. However, in all these methods there is constantly a residual matter to be disposed of even after the recovery process. The technique of getting rid of these wastes in an economic and environmentally friendly approach is called “sanitary landfilling” (Tchobanoglas and Kreith, 2002).

### 2.2 Review of Related Literature

A significant economic impact of solid waste falls upon residential property prices. It is affected by connectivity to road, infrastructure availability, and accessibility. Interestingly, residential property values are affected by solid waste management (Ogedengbe et al. 2006). While using the hedonic method, Havlicek et al. (1971) conducted a pioneering study in this aspect. He examined the impact of five landfills on property rental values in Fort Wayne, Indiana, the U.S.A, by a survey of 182 house sales and rent prices during the period 1962-70 near the landfill. House prices increased by \$9800 per mile from the vicinity of the landfill. A study by Havlicek (1985) at the same put gave a 5% rise. The water contamination due to a hazardous waste dump in Pleasant Plains, New Jersey, the U.S.A. using the hedonic method done by Gamble et al. (1982), observed that the price of houses sold before and after 1974 gave a 10% fall in house prices for 1.5 – 2.25 miles. In another study by Baker (1982) revealed a 21% - 0.55% decrease in house prices with a per-mile increase of 0.5 miles to 1.25 miles. The horrible odor from uncollected garbage and the landfill site, and the dirty surroundings are just right for breeding mosquitoes, insects, and flies. The smoke and noxious gases give rise to health hazards. A house or a dwelling unit combines a housing structure, access to basic facilities, and a high-quality

environment. (Kiel, 2006). The provision of housing and neighborhood facilities and amenity quality determine the variability in land values in a specific spot. The primary major factor determining the property's value is its location, and the quality of the environment is an extra value that gets into the property's sales price. As the direct market is not present for environmental goods, it is better to attribute value to them to see how the market and its price relate to a specific ecological quality. (Irfan & Pant, 2007). The famine of good environmental quality can ultimately affects house prices. Open disposal sites of waste in or near human habitats are fundamental concerns affecting societies. The study has looked into open solid waste disposal and its effect on residential property prices in Alappuzha town in Kerala. Alappuzha, known as 'Venice of the East, was Kerala's first planned town or municipality formed in 1919. The formation of the town was the work of Diwan Raja Kesava Das. The Alappuzha municipality is full of non-natural canals and bridges designed to facilitate trade by water and road. The town stretch over 46.77 sq km comprise of 50 wards. The solid waste generated will reveal an area's consumption patterns, sanitation, and waste management challenges. The daily amount of solid waste generated in the town is estimated to be around 80 tons. The municipality collects approximately 40 tonnes, and the rest are left uncollected. Generally, there is no separation of the wastes before disposal, and so the waste is mixed and disposed of. The waste is dumped in an open dump at Sarvodaya Puram in Mararikulam South Panchayat with 14.26 acres and is around 3Km from the town. The analysis focused on the open dumpsite. A pre-tested questionnaire was adopted for the survey, and the unit of analysis was the individual household with a sample size of fifty around the dump site taken at random. The researcher analyzed the respondents' opinions about the residential land value near the dumpsite. According to Howard and Irwin (1978) cited in Anifowose et al., (2011), an ideal waste disposal site is one that is located rationally in close proximity to the source of the waste, has suitable transportation access, not located in a low-lying area or floodplain, and underlain by geographically stable, strong and competent rock material. It is therefore crucial that many factors must be integrated into sanitary landfill siting decisions. In this regard, Oulun (2002), in an

attempt to create a new agenda for waste management, ascertained the significance of the definition of waste and its impact on waste management, and the function of ownership in waste management recognizing that present legal definitions are ambiguous and do not really give insight into the concept of waste. Facts reveal that there is no theory of management when there are numerous practices as how to deal with a particular type of waste. In a more recent study, Mothi (2022) studied solid waste disposal and its impact on property values and amenities: An assessment of open landfill. The study revealed that land fill by incineration, composting, pyrolysis, and vermicomposting are the most favored methods of waste disposal. However, the study shows that property prices changes either with the quality of waste or the distance from dump site. Also, Peter et al, (2016) assessed the impact of refuse dumps site on rental values of residential properties in FCT Abuja with a view to investigate the relationship between rental values of residential properties and distances away from the refuse dump site. The research revealed that location of properties is the major reasons for the change in rental values and the quality of neighborhood. Hachikaru and Wokero (2018) uses Z-test statistics to examined the impact of waste dump on real estate values in Port Harcourt and established that Rumuolumeni waste dump site has a negative impact on property values and health of residents with close proximity to waste dump. Wokero and Urueshayi (2015) studied the impact of open waste dumps on rental values of residential properties in Port Harcourt. The study compared rents of residential properties located close to open waste dumps and those located away, it revealed that the property located near the dump site tends to have a negative impact in terms of rent compared to the ones located far away. Adeniran et al (2018) opined that values of buildings as well as the physiological welfare of residents cannot be isolated from the building and the environment in which they have. Vissa-a-vis their waste disposal methods

Graiser (2007) specially engaged on a study where he referred solid waste as a solid material which is discarded while Rogdgers (2011) and Chukwuemeka et al (2012) argue that waste management is a systematic control of generation, storage,

collection, transportation, separation, processing, recovery and disposal of wastes. This refers to the Method for the collection, treatment, and discarding of the solid wastes of a community and the development and operation of these systems is often referred to as solid waste management. Inappropriate disposal of municipal solid waste can create unsanitary conditions, and these conditions in turn can lead to environmental pollution and therefore lead to outbreaks of vector borne disease—that is, diseases spread by rodents and insects. The tasks of solid-waste management present difficult technical challenges. They also pose a large variety of administrative, economic, and social problems that must be managed and solved. In another study, Nabegu (2010) examined the result of municipal solid waste analysis undertaken in Kano metropolis conducted through the collection of secondary data from the government agency i.e. REMASAB (Refuse Management and solution Board) charged with the responsibility of management of solid waste, interviews with stakeholders and field surveys specifically to address the noticeable gap that is vital for successful management. Field surveys were conducted in three residential zones that were representative samples of the city to understand its practice and spot the lacunae. In carrying out these, results show that the household sector in Kano metropolis formed the largest amount of waste in the city accounting for 62.5% and waste generated by various institutions accounts for only 5.8% while industries located within residential areas only contributed 2.9%. It was also estimated that Kano metropolis generates about 3085 tones of solid waste per day. Findings however revealed that the solid waste generated in Kano metropolis consisted to a large extent of organic and other biodegradable matter (43%) and constitutes 68.26% by weight of solid waste generated in the study area. Implications such as the emission of dangerous gases into the atmosphere and recovery of bacteria isolates such as coliform bacterias; (*E.Coli*, *Klebsielle* sp). It recommended that the government should put in place adequate facilities, services and opportunities to enhance proper management of solid waste and promote recycling and reuse of waste and should also engage on environmental awareness campaigns to sensitize the citizens to develop the right attitude about disposal. Akaninyere and Atser (2001)

sexamined the typology, characteristics and future trends of solid waste but not the effect of domestic waste. The major components of waste are degradable materials (food remnants, paper, and rags) and non-biodegradable plastics, tins, metals, bottles, glass, and bones. Food remnants however contributes significantly more than other components, this could be explained by the fact that most activities which affect the environment comes from the need for food; its production, processing and preparation. Moreover, the high percentage of food remnants could be viewed from the fact that this component of waste embraces all kinds of food waste from both commercial and domestic sources. Above all the common traditional use of fruits and vegetable on a large scale is another cause. Although, the trends of solid waste have been examined, the author failed to examine the effect of improper waste disposal on property values; hence the need for this paper.

### III. METHODOLOGY

The study adopted a descriptive research design. The study population, sample frame, sample size, and sampling techniques used are discussed alongside the various techniques of data analysis. The location of the study is Tayi, Minna Nigeria. In this study, the survey method was applicable through the use of self-administered questionnaires. This was found to be appropriate for this study because the survey of respondents namely, registered firms of Estate Surveyors and Valuers practicing in Minna and residents (tenants/landlords) of residential properties in the study areas were considered suitable in determining the effect (positive or negative) of proximity to refuse dumpsites on residential properties in the study area. The Study population in this study included firms of Estate Surveyors and Valuers within Minna and residents of residential properties in the study area. As shown in the NIESV Directory (2014), there were 19 firms of Estate Surveyors and Valuers in Minna while according to AEDC data base, (2023) the estimated population of residents apartments is 980. However, the sample size for the residents to be adopted for this study was calculated using this Kothari formula

$$n = \frac{z^2 \cdot p \cdot q \cdot N}{e^2(N-1) + z^2 \cdot p \cdot q}$$

Where: n: is the sample size for a finite population N: size of population which is the number of household's p: population reliability (or frequency estimated for a sample of size n), where p is 0.5 which is taken for all developing countries population and p + q= 1 e: margin of error considered is 3% for this study. z: normal reduced variable at 0.05 level of significance z is 1.96. This generated a sample size of 257. A set of closed-ended questionnaires were prepared and administered to gather information. The study also used the simple Random sampling technique in choosing the sample units for the residents in the study area. Sampling was clearly unnecessary for all the nineteen (19) registered firms of Estate Surveyors and Valuers as they are not too large for study. This method of sampling was adopted because it considers the heterogeneous nature of a study population. However, a five point likert scale were used to analyzed the opinion of estate surveyors on the effect proximity to dump site on rental values and the relative rent passing on one bedroom/two bedroom apartment in the study area and F-lay out which is a neighboring community to be able to make comparison. The five points scale is strongly agreed, agree, indifferent, disagree and strongly disagree.

Table 3.1 Distribution of Questionnaires

Questionnaires	Frequency (f)	Percentage (%)
Returned	200	77.8
Not Returned	57	22.2
Total	257	100

Source: Author's Field Survey,(2024)

#### IV. RESULTS AND DISCUSSION

The results collected from the questionnaires retrieved are analyzed below:

Table 4.1 Types of Home ownership

Item	Number of respondents	Percentage (%)
Owner	124	2
Occupier		
Rented	76	38

Apartment		
Total	200	100

Source: Author's Field Survey,(2024)

The table shows that the majority of the residents in the study area are owner occupiers with 62% while 38% are tenants.

Table 4.2 Types of waste generated in the study area

Types of waste	Frequency	Percentage (%)
Organic waste	42	21
Hazardous waste	14	7
Solid waste	40	20
Liquid waste	98	49
Recycled waste	6	3
Total	200	100

Source: Author's Field Survey,(2024)

The table shows that 49% of the waste generated in the dumping site (Abattoir) is liquid types of waste. 29% 20%,7% and 3% for organic waste, solid waste, hazardous waste, solid and recycle waste respectively.

Table 4.3 Method of waste disposal in the study area

Mehod	Frequency	Percentage (%)
Prevention & reducing waste	-	00
Recycling	-	00
Incineration	98	49
Sanitary Lndfill	102	51
Contact WB waste	-	00
Total	200	100

Source: Author's Field Survey,(2024)

The table shows the responses on the methods of waste disposal and management adopted in the abattoir. It revealed that none of the basic methods of waste disposal and management is been adopted while 5% and 5% were recorded incineration and and sanitary landfill respectively.

Table 4.4 Effect of generated waste in the study area

Effect	Frequency	Percentage (%)
Air pollution	182	91
Water Pollution	2	01
Soil contamination	6	03
Spread disease	10	05
Total	200	100

Source: Author's Field Survey,(2024)

The table shows the effect of generated waste on the environment and residents. It revealed that 91% of the waste causes air pollution and 2%,6% and 10% for water pollution, soil contamination and spread diseases respectively.

Table 4.4 Average rental values of buildings in the study area and a close environ

Types	Tayi (The study area)	F-Layout
One bedroom	₦100,00- ₦120,000	₦150,00- ₦200,000
Two bedroom	₦150,00- ₦200,000	₦200,00- ₦250,000

Source: Author's Field Survey,(2024)

The table shows that the rental value of one bedroom in the study area goes for about ₦100,00-₦120,000 as against ₦150,00-₦200,000 in F- lay out. And two bedroom for ₦150,00-₦200,000 and ₦200,00-₦250,000 for the study area and F- lay out respectively

Table 4.5 Factors that affect rental values of residential properties in close proximity to the abattoir in the study area

S/N	Factors	Strongly Agree(5)	Agree (4)	Indifferent (3)	Disagree (2)	Strongly Disagree (1)	Mean	Rank
1	Location	7	2	1	0	0	4.60	2 <sup>nd</sup>
2	Proximity to Abattoir	9	1	0	0	0	4.90	1 <sup>st</sup>
3	Accessibility	0	0	2	8	0	2.60	3 <sup>rd</sup>
4	Environmental zone	0	0	0	1	9	1.20	5 <sup>th</sup>
5	Road traffic & noise	0	0	0	1	9	1.20	5 <sup>th</sup>
6	Security	0	3	2	3	2	2.60	3 <sup>rd</sup>
7	Building age	0	0	1	1	8	1.30	4 <sup>th</sup>

Source: Author's Field Survey,(2024)

Remarks:

- 1.8 to 1.99= Very Low
- 2.0 to 2.99= Low
- 3.0 to 3.99= Moderate
- 4.0 to 4.99= High
- 5.00= Very high

The analysis above illustrates the various factors that influence changes in rental values of residential properties in close proximity to the refuse dumpsite ( Abattoir) location in the study area. From the analysis above, it can be seen that majority estate surveyors were of the opinion that location and proximity to the abattoir in the study area were the major factors that

can influence such changes in rental values of their properties ranking it as the highest among all other factors.

## V. CONCLUSION

The study established that generally there may be other factors that influenced the value of residential properties in the study area but how ever, proximity to dump site (Abattoir) in the community have a significant negative effect on the rental values of residential properties as a result of the liquid waste disposed without proper management thereby creating air pollution in the study area which posed a

serious health threat to the occupant in the community

#### 5.1 Recommendations

Estate Surveyor and Valuer should advise their clients and dangers of living or locating their properties in close proximity to any dumpsite location. The Government should also create awareness programme for residents in these areas on its health implications of such locations and possibly relocate the dumpsite or the residents or provide a better way of managing the waste produced the study area.

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