**THE EFFECT OF WASTE DISPOSAL SITE ON RESIDENTIAL REAL ESTATE VALUE IN MINNA, NIGERIA**

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***ABSTRACT***

*The aim of this study is to determine the effects of waste disposal sites on residential real estate values in Minna, Nigeria with the view of investigating the correlation between rental values of residential properties and their distances away from waste disposal sites within Minna, Nigeria. The research identified the types of residential properties within the study area and their distances away from refuse disposal site. Also, the study examined the level of impact waste disposal site has on property values. Result of this study will be useful to individuals, real estate investors and government in terms of policy making and implementation. Data for the study were collected through observations, field surveys, interviews and the administration of well-structured questionnaire to 52 respondents. Frequency tables and multiple regression analysis were used to analyze the data collected. The result of the study suggests that proximity to waste disposal site has no statistically significant effect on residential real estate value. This is as evident by the result of the regression analysis as the p-value for proximity to waste disposal site which is at 0.98, surpassing the 0.05 margin. The study recommends that property investors can go ahead to invest in residential properties in the study area as the presence of the waste disposal site does not affect property values.*

1. **Introduction**

**1.1. Background of the Study**

Man is naturally a waste generator and he accumulate wastes as a result of the improper deployment of energy and resources in his daily activities (Laohalidanond, Chaiyawong & Kerdsuwan, 2015). These wastes come in various forms; as organic, from food, leaves and others; plastics, glass, metal, toxic substances and hazardous/ non-hazardous solid and liquid wastes (Kolekar, Hazra, and Chakrabarty*,* 2016; Gupta, Yadav and Kumar*,* 2015). As man generates wastes, it is also his responsibility to dispose it off in a way that is not harmful to other living things and the environment. Where the waste is poorly managed, it becomes contaminants which in turn pollute water ways, block drainage systems, become breading site for rodents plus other disease causing insects and also affect the economic prosperity of the neighbourhood and country at large (Kumar, Smith, Fowler & Velis*,* 2017).

Globally, the amount of waste generated in 2016 is estimated to be about 2.01 Billion Tons per year with about 33% (663,300,000 tons) not properly managed in an environmentally friendly manner (The World Bank Group, 2021). This figure is expected to increase to about 3.4 Billion metric tons by the year 2050 reflecting an increase of about 70% within a 34 year time frame (Khandelwal, Dhar, Thalla, & Kumar, 2019). The high amount of solid waste generated globally according to Rana, Ganguly and Gupta,(2015) is as a result of population explosion, positive economic growth, rapid industrialization and urbanization. As nations grow and develop through population increase and urbanization, rising from low income through to high income levels, so also is the solid waste management condition made more challenging (Sharma & Jain, 2020).

Africa accounts for about 8.7% of the total global solid wastes, generating a projected annual solid waste of 174 Million tons in 2016, a figure that is expected to rise significantly to about 244 Million tons per year by the year 2025 (Godfrey, Ahmed, Gebremedhin, Katima, Oelofse, Osibanjo, Richter & Yonli, 2019). The rapid rate of urbanization in African countries has mounted serious pressure on cities, towns and their environs (Saghir & Santoro, 2018; Aliyu & Ahmad, 2017). Naturally as it applies to African countries, over 90% of solid wastes are disposed of in landfills, open burning, uncontrolled dumping in open sites and recycled (Godfrey *et al.,* 2019). Poorly managed dumpsites, public exposure to these dumpsites, as well as the increase in the amount of wastes generated within the continent have raised serious health, environmental and economic concerns (Dugbazah, Glover, Mbuli & Kungade, 2021). It is worthy of note that only 4% of the total wastes generated in Africa is recycled which in most cases is carried out by marginalized informal recyclers (Godfrey *et al.,* 2019). More so, developed countries have turned Africa to a dumping ground for harmful wastes including end of life of Electrical and Electronic Equipment (EEE) and used vehicles (Balde, Forti, Gray, Kuehr & Stegmann, 2017)

In sub-Saharan Africa, solid waste management is at its weakest form and is a major problem facing the region. Majority of the cities in this region battle with the problem, spending between 20% to 50% of their environmental budget on solid waste management but even at that, only 20% to 80% of the city wastes are collected (Orhorhoro & Oghoghorie, 2019). Most cities within this region are characterized by a heap of decomposing solid waste on major streets, markets, open lands, uncompleted buildings and drainage systems (Orhorhoro, Ikpe & Tamuno, 2016). The heaps of solid wastes seen within these cities is a source of concern for city managers as they block drainage systems and water ways thereby leading to flooding and erosion of the towns and cities. They also serve as breeding grounds for mosquitoes which are of serious health concerns.

Solid waste generation in Nigeria is estimated to be above 32 million tons annually, representing 18.4% of the total solid waste generation in Africa (Bakare, 2020). Majority of these wastes are generated at the household level while a sizeable number is also generated through activities of local industries, artisans and traders who litter the environment.

Solid waste management in Nigeria is under the control of the Federal and State Ministries of Environment while at the Local Government level, it is within the purview of the Department of Environment. The establishment of waste management Authorities in Nigeria has led to each state developing its own strategies for waste management most suitable for it (Nwosu & Chukwueloka, 2020).

According to a report published by Clean Up Nigeria in The Nation Newspaper, Akwa Ibom is the cleanest state in Nigeria as December, 2020. This is the result of a study conducted by the group (Clean Up Nigeria) between December, 2019 and November, 2020. The study ranked states against five indicators; Streets and road cleanliness; Vegetation and Drainage Control; Waste Management Service; Public Opinion Poll/ Social Media and Knowledge, Attitude and Practice of Hygiene and Sanitation of the People.

The improper way of waste management in Nigeria has undesirable effects on health and the environment through water, soil and air pollutions, environmental degradation, poor landscape and littering of the environment (World Health Organization, 2015).

The presence of dumpsites in close proximity to houses in urban areas has become a major problem affecting the present day society as such, prompting different researches to be conducted on the impact of dumpsites and landfills on property values and also as an environmental problem (Peter, Oni, Ibisola, Boroni & Amusan, 2016; Nwosu & Olofa, 2015). It is in view of the foregoing that this research seeks to examine the effect of waste disposal on residential real estate value in Minna, Nigeria.

**1.2. Mission Statement**

This empirical research is one that attempts to assess the effect of waste disposal site on residential real estate value in Minna. The research will therefore reduce the knowledge gaps in areas that require consideration for the realization of the stated objectives. The findings and recommendations from this research will provide a database and a foundation for further research into this subject matter. It will be valuable to not only government, but also individuals and real estate property investors as well; it will be a useful tool for policy reformation on residential location factors, and a guide to urban planners, civil servants, investors in real estate and academicians. The study will add to the existing body of literature on real estate investment location choices.

**1.3. Research Aim**

The aim of this study is to determine the effects of waste disposal sites on residential real estate values in Minna, Nigeria with the view of investigating the correlation between rental values of residential properties and their distances away from waste disposal sites within Minna, Nigeria.

**1.4. Research Questions**

i. What are the various types of residential properties and their distances from the waste disposal site in Minna, Nigeria?

ii. What are the rental values of residential properties close to and further away from waste disposal sites in the study area?

iii. What are the effects of waste disposal site on proximate residential property values in the study area?

* 1. **Research Hypothesis**

H0 – There is no statistically significant difference between rental values of residential properties close to waste disposal sites and the rental values of residential properties far from waste disposal sites.

H1 – There is a statistically significant difference between rental values of residential properties close to waste disposal sites and the rental values of residential property values of properties far from waste disposal sites.

**1.6. Scope of the Study**

This research is on the effect of waste disposal site on residential real estate value in Minna, Nigeria. In order to carry out an effective research and also for the purpose of producing a bias free result, the researcher has selected Kpakungu and Bajego in view of the existence of refuse disposal site within residential areas. Also, residential properties within the study area are grouped into two (2) using distance away from the waste disposal site as a yardstick. The first group, being residential properties within 150 metre radius of the disposal site, is categorized as proximate properties while all other residential properties located between 151 - 300 meter radius from the disposal site is categorized as distant properties as adopted from Igbara *et al.* (2016).

Furthermore, this study is focused on tenement buildings, one-bedroom and two bedroom apartments only. This is for the sake of convenience and availability of information as transactions in these types of properties are more frequent. All other residential property types other than the aforementioned are not considered even though some exist within the study are but in handfuls.

More so, the basis of comparison between the proximate and distant properties is the rental values of such residential properties. The choice of this is because residential properties within the study area are more let and leased than purchased or sold.

* 1. **Description of the Study Area**

The city of Minna is the state capital of Niger state in Nigeria. The city is located on Latitude 9 37’ North and Longitude 6 33’ East. It occupies a land area spanning about 884 hectares. It is encapsulated by the Bosso Local Government Area of the state and has a distance of about 150km by road from Abuja, the federal capital city of Nigeria (Aliyu, 2013).

**2.0. Conceptual Framework**

**2.1 Solid waste generation, collection and transportation**

Solid waste refers to all unwanted or useless materials that are in their solid state of matter and are thrown away by members of the society or any substance a person or an organization considers worthless to it (Kolekara *et al.,* 2016: Orhorhoro & Oghoghorie, 2019).

The day to day activities of human coupled with inappropriate energy and resource utilization leads to waste generation (Laohalidanond *et al.,* 2015). The population of humans living in urban areas especially in developing countries is rapidly growing on daily basis as it is estimated that two-third of the world population will be living in urban areas by the year 2025 (UN-Habitat and UNESCAP, 2015).

In Nigeria today, the rate at which solid wastes from diapers, plastics and other waterproof materials are generated is increasing (Nnaji, 2015). Also, food wastes contribute about 50% of the total wastes generated in urban areas within Nigeria (Nnaji, 2015).

Rana, Ganguly and Gupta (2015) opined that the amount of waste generated in a nation has a positive relationship with its urbanization, population explosion, economic growth and industrialization. As countries grow and develop from low income levels through to high income levels, their solid waste generation also grows alongside thereby making solid waste management more difficult (Sharma & Jain, 2020).

With a global population of 16%, High Income Countries generated a total of 34% of the global waste in 2016 while the Low Income Countries of the world that account for 9% of the global population contributed about 5% of the global waste generated the same year (World Bank Group, 2018).

Igbinomwanhia, Obanor and Olisa (2017) carried out a research on solid waste characterization to determine an effective solid waste management option in Amassoma community in Bayelsa State. The result of their findings revealed that over 1,115kg of solid waste is generated daily within the community comprising of biodegradable materials (compostable waste), combustible and incombustible wastes accounting for 51.34%, 33.62% and 15.04% respectively of the total wastes generated.

Waste collection and disposal systems on the other hand are faced with series of challenges. Some of such problems include the non-existence of dumpsite within the neighbourhood, the use of one waste receptacle for all waste types, the small nature of waste bins in overpopulated neighbourhoods leading to overflow of waste (Udoh & Inyang, 2016). Olukanni, Adeleke and Aremu (2016) identified some of the factors affecting waste collection and disposal to include people’s attitude towards waste management, poor and inadequate solid waste management infrastructure, weak government policy, the economic status of households and inadequate funding of the sector.

Egbu and Okoroigwe (2015) suggested that households must be encouraged to patronize private waste collectors instead of relying solely on the government provided collectors, even though the responsibility of waste collection and transportation rests on the government. This they say will help solve some of the problems presently witnessed in waste management sector.

**2.2 Real estate**

Real estate may be defined as the totality of land, building, natural resources, all immovable property permanently fixed to land as well as the interests that exists on such land. According to Anjali (2019) real estate can be classified into seven (7) based on their uses. These are: residential real estate, industrial real estate, commercial real estate, retail space, land, fix and flip properties and mixed use.

**2.3 Real estate as an investment**

Anjali (2019) defines real estate investment as the acquisition of physical properties which are generally immovable, ownership and use can be transferred and are also capable of generating regular streams of income in the future.

In recent times, there has been a significant growth in intangible assets investment in Nigeria but real estate is still considered as good and well-diversified investment portfolio (Garay, 2016).

**2.4 Residential properties**

Residential properties are used wholly or substantially to provide living accommodation, or residence for individuals or families. Olusegun (2003) identified that residential properties are of various types as follows:

1. **Tenement Properties**: These are properties usually design such that each consist of double row of rooms separated by a corridor or passage the walls can be mud or sandcrete block works. It is particularly known in Nigeria as “face me, I face you”. They are usually let on a room and parlour basis, while the occupant share common entrance to the house as well as other common area such as passage, kitchen, bathroom and toilet. They are also referred to as “rooming apartment”.
2. **Flat**: A self-contained accommodation unit on one floor in a block of other units.
3. **Maisonette**: This is a two family house having quarters with separated entrance for two families usually storey with separated apartment on each floor.
4. **Terrace Bungalow**: This is a self-contained single storey accommodation unit in a row of three or more units.
5. **Semi-datached Bungalow**: A self-contained storey accommodation unit in a two family apartment separated by a party wall.
6. **Detached Bungalow**: This is a self-contained single storey accommodation unit on its own ground.
7. **Terrace House**: A self-contained accommodation unit on more than one floor in a row of three or more units.
8. **Duplex**: A self-contained accommodation unit on more than one floor in a two family residence, separated by wall, it can be described as semi-detached house.
9. **Detached House**: A self-contained accommodation unit on more than one floor on its own ground.
10. **Mansion:** This is a luxury accommodation; it is a very large imposing residence with many self-contained dwelling units.

**2.15 Residential property and rental value**

A building is regarded as residential building when more than half of the floor area is used for dwelling purposes. Other buildings should be regarded as non-residential.
Two types of residential buildings can be distinguished: houses (ground-oriented residential buildings): comprising all types of houses (detached, semi- detached, terraced houses, houses built in a row, etc.) each dwelling of which has its own entrance directly from the ground surface; other residential buildings: comprising all residential buildings other than ground-oriented residential buildings as defined above. Several factors ranging from accessibility, physical characteristics of the neighbourhood services and facilities, social environment, individual site and dwelling characteristics all forms part of what informs the selection of new residence (Nasir, 2021). They further stated in the work that besides all the above mentioned attributes, location is also one key determinants of house price. Location is a time – distance relationship or linkage between a property or neighbourhood and all other possible origins and destinations of people going to or coming from the property or neighbourhood. In the opinion of Adesoji (2010) good quality housing provides the foundation for stable communities and social inclusion. This presupposes to say that people will go to any length to get good value for their money.

With this development in many metropolitan areas, high income earners tend to live outside the center of the city while low income families continue to reside in the cities, close to employment centers.

**2.16 Effects of waste disposal site on residential property value**

Nwosu and Olofa (2015) investigated the effect of the existence of a dumpsite on the rental values of residential properties in Apete, Ibadan. In their study, structured questionnaires were administered to 100 randomly selected residents located around the dumpsite. The result shows no significant effect of the dumpsite on the rental value of residential properties even as distance decreases to the dumpsite. The reason according to them, may be as a result of the settlement being predominantly inhabited by students and low income earners.

Peter *et al.* (2016) investigated the influence refuse dumpsites have on residential property rental values in Utako area of the Federal Capital Territory, Abuja. The study was aimed at investigating the relationship between rental values of residential properties and the distance of such properties away from the dumpsite. To achieve this, the researchers administered questionnaires to all registered firms of Estate Surveyors and Valuers in the area and also residents within 500 metres radius of the dumpsite in concentric manner. The data generated were analyzed using the Concentric Rings Model and Linear Regression Models. The result of their study however, proved the existence of a significant impact of the dumpsite on rental values of residential properties. The closer a property is to the dumpsite, the lesser the rental value and vice versa.

Igbara *et al.* (2016) studied the changes in rental values of residential properties in Rumuolumeni area of Port Harcourt and its environs due to the presence of dumpsite. With a total population of 504 residential properties, this was divided into zones of A and B. Zone A, representing residential properties within 150 metre radius of the dumpsite while Zone B represents residential properties located between 151 – 500 metre radius of the dumpsite. The data gathered was analyzed using multiple regression technique. The result however, shows that there is a significant difference between rental values of residential properties of the same type across the two zones..

**3.0. Research Methodology**

**3.1. Population of the Study**

The population for the study consists of 202 inhabited housing units located within 300 metre radius to Kpakungu waste disposal site.

**3.2. Method of Data Analysis**

All data collected from field survey will be subjected to one form of statistical analysis or the other based on the objectives of this research. Concentric ring model, frequency and percentage tables and linear regression will be employed in analyzing the data collected for this study.

4.0. Result and Discussion

4.1. Results

**Table 4.7 Type of apartment occupied**

|  |  |  |
| --- | --- | --- |
| **Type** | **Frequency** | **Percentage** |
| Tenement building | 15 | 28.8 |
| Self-contain | 15 | 28.8 |
| One Bedroom | 8 | 15.4 |
| Two Bedroom | 14 | 27 |
| **Total** | **52** | **100** |

Source: Author’s Field Survey, 2024

The Table above describes the types of apartments occupied by the respondents within the study area. From the table, it could be seen that tenement buildings and self-contains have the highest frequencies of 15 each representing 28.8% of the total respondents. With a frequency of 14 and a percentage of 27, is 2 bedroom flats while 1 bedroom flat has the lowest frequency.

**Table 4.8 Residential property types and their distances away from waste disposal site**

|  |
| --- |
| **Residential Property Types** |
| stance in Metres | Tenement | Self Contain | 1 Bedroom Flat | 2 Bedroom Flat |
| F | F | F | F |
| 0 – 150 | 10 | 5 | 5 | 3 |
| 151– 300 | 6 | 8 | 6 | 9 |
| **Total (52)** | **16** | **13** | **11** | **12** |
| **% of Total (100)** | **30.8** | **25** | **21.2** | **23** |

Source: Author’s Field Survey, 2024

Table 4.8 above shows residential property types with their distances away from waste disposal site. As shown on the table, 9 tenement houses, 4 self contains, 3 one bedroom and 6 two bedroom flats are located within 150 metre radius of the waste disposal site. This brings to the total of 23 residential properties that are considered to be in close proximity to waste disposal site.

More so, the table also presents residential properties that exists farther away from waste dumpsites as tenement buildings have a frequency of 6, self-contains with 11, one bedroom flats with 5 while 2 bedroom have a frequency of 8.

**Table 4.12 Test of significance for factors on rental values**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* |
| Intercept | 78287.57 | 55541.07 | 1.409544 | 0.166806 |
| Household Income…X1 | 0.792449 | 0.229181 | 3.457746 | 0.001358 |
| Proximity to dumpsite…X2 | -160.738 | 6509.072 | -0.02469 | 0.980428 |
| Location of the property…X3 | 2864.612 | 10568.91 | 0.271041 | 0.787826 |
| Accessibility…X4 | -13078.6 | 8579.125 | -1.52446 | 0.135673 |
| Road traffic and noise…X5 | -9617.09 | 6166.414 | -1.55959 | 0.127147 |
| Security…X6 | -6472.3 | 7353.347 | -0.88018 | 0.384292 |
| Building age…X7 | 5899.731 | 7052.106 | 0.836591 | 0.408053 |
| Neighbourhood quality…X8 | 3777.455 | 9243.486 | 0.408661 | 0.685082 |
| Increase in cost of construction…X9 | -3855.41 | 12382.28 | -0.31137 | 0.757225 |
| Increase in population…X10 | 6776.674 | 13284.59 | 0.510115 | 0.612921 |
| Rent control measure…X11 | -19623.8 | 11517.01 | -1.7039 | 0.096566 |
| Structural characteristics…X12 | 10464.09 | 9736.784 | 1.074697 | 0.289287 |
| Availability of infrastructure…X13 | 878.9543 | 8254.834 | 0.106478 | 0.915764 |

Table 4.12 above presents the result of significance test performed for the factors perceive to have effect on rental values of residential properties.

From the table, it could be seen that proximity to dumpsite is not significant with a P-value of 0.98 therefore, we conclude that solid waste disposal site does not have any significant effect on residential real estate value. However, household income on the other hand, with a p-value of 0.001 which is less than 0.05 has significant effect on residential property values within the study area. This finding is in compliance with the findings of Udo and Egbenta (2002); andNwosu and Olofa (2015) which concludes that waste disposal sites does not have negative effect on property values. This study is at variance with the studies of Bello and Bello (2005); Ogedengbe and Oyedele (2006); and Adewusi and Onifade (2006), which assert that waste dumpsites have negative effect on rental values.

This may be due to the fact that majority of the respondents are low-income earners and majority of the residential properties are tenement buildings.

**5.1. Conclusion**

In conclusion, the findings of the research shows that household income is the major determinant of rental values of residential properties within the study area as against the assertions of some researchers (Bello and Bello, 2005; Ogedengbe and Oyedele, 2006; and Adewusi and Onifade, 2006) who opined that waste disposal sites negatively affect property values.

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