

Examining the Negative Impact of Abattoir Operations on Residential Property Value within Abattoir Site in Port Harcourt Metropolis

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Abstract.

Property Values are known to respond to various indices such as market forces of demand and supply, serene environment, etc. Thus intending occupants especially for residential purposes would always desire an environment that is void of environmental issues and other vices. This study seeks to examine the impact of Abattoir operations on residential property values in Port Harcourt Metropolis. The study adopted a descriptive survey design where structured questionnaires were administered to Landlords, Tenants and Estate Surveyors and Valuers leaving or operating within the study area while Abattoir operators were interviewed on the functionality and sanitary state of the Abattoir. A total of 145 questionnaires were administered and 106 representing 73.0 % were retrieved and use for analysis. Analyze data were presented using tables and thematic analysis. The study revealed an average of 26.7 and 39.8 decline on rental value in Oginigba and Asuabie-Town respectively using Woji as baseline. The study recommends a relocation of Trans-Amadi abattoir and Government rolling out mitigation plans to address the stigma on residential properties

Key words: Abattoir, Abattoir Operations, Residential Property, Property Value.

1. Introduction:

The nature of life in a particular environment is directly characterized by the human activities in and around that environment thereby adding positively to the value of the environment or impacting negatively to its existence. In food animal production, there are associated waste being generated in the process, more attention ought to be focused on the interaction between the production processes and environmental condition in such a way that contamination, degradation and damage of the environment could be avoided (Victor, 2017). In the study of Harnos (2019), He submitted that there is a connection /interaction between urban services and residential property values in an urban center. This means that the existence, safety and productivity of life and property in and around an environment depend to a large extent on government regulations and proper monitoring to exert control on public good and private investments. Thus environment is either developed potentially, otherwise it is degraded and destroyed by individual players if check and monitoring is not prioritized. Hence Tamenech and Temirat (2017) opine that the interaction between animal production and the environmental condition at any location should be highly regulated such that could seek a wholesome and safe meat production and avoid environmental pollution and associated human health hazards.

Abattoir is seen to be an important urban land use, its day to day activities such as animal slaughtering, trimming and washing of meat result in its enormous known advantages especially in the supply of food protein to the teeming population of the city. However, Bello (2009) revealed that despite the advantages that abattoir may portray, that there are hazards and known threat being posed to the immediate environment. Such threat is basically environmental hazard associated which include among others, carbon emission from burning of furs into meat [kpomo], direct discharge of organic wastes into the surroundings and also the indiscriminate litter of animal droppings by herds of cattle and goats in the area. Such meat production that can meet the demand in the city is produce in a large quantity, and its bye-product such as leather and skin is associated with livestock waste spills which are detrimental to humans and the environment at large if definite precautions are not taken (WHO, 1991).

Abattoir waste disposal and management in Nigeria and Port Harcourt in particular are carried out indiscriminately and inadequately in such a way that the operator care-less about the environmental health and health of people in and around their vicinity of operations, thereby constituting environmental hazard to lives in their close proximity (Aniebo, 2008). Ezeoha and Ugwuishiwu (2011) observed that abattoir size, types and number of livestock's processed on daily basis are directly proportional to the pollution potential of such abattoir to its immediate environment. Trans-Amadi abattoir being the feeder that supply processed meat to other community market is known for its large scale processing. Investors on residential/commercial properties and owner-occupier developers have suffered a great lost on their investment and thereby looking up to the aid of government agencies responsible for regulating the activities of these abattoir operations to save their investment as their investments in property within the area crumbles due to the stigma and the environmental issues created.

1.1 Aim of the Study

The study is aimed at examining the negative effects of abattoir operations on residential property values in Port Harcourt.

1.2 Objective of the Study.

The specific objective of this study is to

1. Examine the negative effect of abattoir operations on residential property values.
2. Investigate the degree of rent decline experienced by property owners in close proximity to slaughter house due to its operations.

2.

Review of Literature

2.1 Abattoir

Abattoir is one of the facilities available in most towns and cities in common practice for slaughtering of animals to supply meat for human consumption Bello and Oyedemi, (2009). According to Collins English Dictionary, abattoir is any premises use for or in connection with the slaughter of animals whose meat is intended for human consumption and include a slaughterhouse, but does not include a place situated on a farm. Bello and Oyedemi (2009) explained that the provision of abattoir facilities in neighborhoods is crucial to the sustainability and efficiency of the residential properties value. The location and management of abattoir in the residential neighborhood is to provide an environment in which the tenants or landlords may have an easy walk to the abattoir where they may obtain their daily household foods. The accessibility and nearness of abattoir to consumers may present some advantages, but the effect of its management on the built environment and health of residents posed great risk (Bello and Oyedemi, 2009). This study is more concern of being expressed over danger to the health of residents who are neighbors to abattoirs where level of awareness is low with regards to values on residential properties. Today in the expression of Bello and Oyedemi (2009), residents who are closer to abattoirs doubt the compatibility of abattoir with residential land use with expression of dissatisfaction with the location and management of abattoir in their neighborhoods where residential properties are situated.

2.2 Abattoir Operations

Abattoir is seen as a facility where animals are slaughtered for consumption as food for humans (Canencia *at el.*, 2016). According to Bello and Oyedemi (2009), provision of basic facilities and services in abattoirs is crucial to the sustainability and efficiency of neighborhoods environmental quality (Auwalu and Ibrahim, 2015). Abattoir operations pose significant challenges to the effectiveness of environmental management as it is associated with decreased in quality of human life residing close to these abattoirs (Adeyemo, 2002). The abattoir operations especially where modern or effective waste disposal system are not practiced have negative effect on air and water quality within the residential properties within the same neighborhood Bello and Oyedemi, (2009). Fearon, Mensah and Boateng (2014) stated that abattoir operations are meant to recover the edible portions of the slaughtered animals for human consumption. However, locating these facilities and its operations in residential neighborhoods, its disadvantage outweighs their advantage (Auwalu, 2015). Oyedemi (2004) as cited in (Auwalu et al., 2015) stated that abattoir operations are associated with some diseases; pneumonia, diarrhea, typhoid fever, asthma, wool sorter diseases, respiratory and chest diseases as reported by medical experts. Currently, as regards to the above assertion,

abattoir operation at the Trans-Amadi Abattoir apparently does not meet the required standard specified under relevant laws

with the significant quantities of waste materials: organic and inorganic solids generated. According to Fearon, Mensah and Boateng (2014), solid waste at abattoir consists of bones, undigested ingest and occasionally absorbed fetuses, while the liquids comprises of blood, urine, water, dissolved solids and gut contents. Studies has pointed out that abattoir operations are responsible for the pollution of face surface and underground waters as well as air quality which indirectly affect the health of occupants of residential properties living within the abattoir vicinity (Fearon *at el.*, 2014).

2.3 Neighborhood

The term neighborhood can be described as an area within which common characteristics of population and land use prevail (Alonso, 1964). According to Ogumba (2010), neighborhood characteristics affecting property value include the class of property in the area, environmental conditions like atmospheric pollution and noise levels, socio-cultural factor like population density, demographic mix, availability of water supply, roads, electricity supply. With absence of these features, property values are reducing through rent a prospective tenant would offer. The environmental condition and noise level in abattoir neighborhoods have great effect on the environment. Therefore, abattoir operations and activities seriously posed a threat to environmental conditions with an increase in air, water, and noise pollutions which significantly affect residential properties value. The assertions have shown that abattoir operation is directed to the neighborhood's environmental conditions thereby creating an effect on property values. The creation of land use pattern/land value to its course defines how useful some sites are for a particular use (Ogunba, 2010). The above pointed out the issues in the sitting of abattoir with other land use, because abattoir land use will have relied on residential land use. The infiltration of undesirable land uses in the neighborhood changes zoning controls and environmental pollution which reduces demand, and bringing negative pressure on residential property values. Cellmer, Senetra and Szczepanska (2012) observed that residential property values are also influenced by the environmental attributes of a given location, including neighborhood quality. The choice of residential property location is largely determined by the tenant's financial capacity, preferences and needs which arise in view of their personal circumstances such as neighborhood quality (Zrobek, Trojanek, Zrobek-Sokolnik and Jorojanek, 2015).

2.4 Neighborhood Quality

According to Wong (2005) as cited in (Shuaibu *at el.*, 2018), neighborhood quality is seen as a multi-dimensional idea with wide range of aspects. Many authors have different perception of neighborhood quality. In the other hand, Fatemeh (2013) considers neighborhood quality as a phenomenon or event that formed interactions with the physical characteristics on one hand and cultural patterns and mental abilities on the other hand. Environmental quality is defined by the neighborhood quality depending on the wellbeing of the residents of an urban centre (Shuaibu *at el.*, 2018). The above particularly applies to the fact that neighborhood quality has direct impact on the socio-economic development of any city. A sustainable neighborhood quality is pertinent to a participatory approach with enhance collaboration between stakeholder to maintain present property values and neighborhood stock (Ilesanmi, 2012). The ideally, emphases laid on neighborhood quality relates to property values, housing quality and quality of life of the occupant.

2.5 Residential Property

According to Douglas (2001), various classification schemes can be used to describe types of properties. However, a more workable and more inclusive of these have classified the type of properties used as; residential, commercial, industrial, recreational, transportation agricultural, mineral, services area, contaminated/brown field. According to Ekenta (2010), residential properties are properties suitable for living in. Residential properties account for most of the area of cities use for dwellings that represent the areas where most people live (Douglas, 2001). Residential properties include single family houses, duplexes, block of flats, marionettes, tenement buildings, semi-detached bungalows, detached bungalows, etc. (Akujuru, 2001). When flats are available for rent, it is considered a good investment (Kuye, 2000). The rental value of residential properties is dependent on the condition, location and

neighborhood of the premises, and the availability of services such as lifts, boilers, water supply electricity, etc. (Kuye, 2018). According to Ogunba (2013), residential properties occupies the largest use of land in urban areas, and it is generally forced out of central areas by the expansion of business uses. Only high income and local authority housing especially in United Kingdom that are not forced out. Hence, house users have to balance accessibility requirements with those of amenity.

2.6 Stigmatizing Effect of Abattoir Waste Dumps

The stigmatizing effect of abattoir waste dumps is one that is taken most seriously, primarily because of the extremely high risk found among people in their vicinity developing cancer (Hamilton and Viscusi, 1999); since industrial proximity already points at a bundle of environmental risks (noise, smell and traffic), and it is impossible to single out the effect of the abattoir waste. Environmental hazards have different effects on different segments of the real estate market. Ihlanfeldt and Taylor (2004) estimated the total loss of property value in every segment within a 1.5-mile radius of a contaminated site found a 10% total decrease in value. It is interesting that some property owners were against locating abattoir site in property development area, because they were afraid that when stigma set in the future, such would result in lower sale values (Gregory, 1996). Neupane and Gustavson (2008) found that a vicinity of a large abattoir waste dump, that its negative effect on property value that extends to a few hundred meters’ radius from the activity site cannot be over emphasis .

3. Research Methodology

The study adopted a survey research design which according to Ali (2006), is a study that is mainly concerned with describing and explaining events as they are without any manipulation of what is being observed. Also (Naoum, 2013) says that a survey research design is useful when establishing the relationship and association between the attributes or objects and how they associate with one another. The survey involves a planned collection of data over a large area for the purpose of making a well-informed decision.

4. Results and Discussions of findings

Table 4.1: Questionnaire Administration and Retrievals

Study Area	Administered		Retrieved		Not Retrieved	
	Freq.	%	Freq.	%	Freq.	%
Woji	48	100.0	35	73.0	13	27.00
Oginigba	48	100.0	35	73.0	13	27.00
Asuabie Town	49	100.0	36	73.5	13	26.50
Average	145	100.0	106	73.0	39	27.00

Source: Author’s Field Investigation, 2021

Table 4.2 Abattoir Waste Generation

Waste Category	Cattle/day	Goat/day	Sheep/day	Total/day	Total/year
Blood/head (kg)	882	61.2	32.4	975.6	356,094
Intestinal content/head (kg)	560	146.2	56.25	762.45	278,294.25
Waste tissue/head(kg)	448	68.0	36.0	552.0	201,480
Bone head(kg)	826	175.1	92.7	1,093.8	399,237
Total	2,716	450.5	217.35	3,383.55	1,235,095.25

Source: Author’s Field Investigation, 2021

4.1 Environmental Hazard Found with Abattoir Operations

Table 4.3 shows the environment challenges faced by respondents in and around the abattoir neighborhood to include air pollution, soil pollution, noise pollution, proliferation of insects and stigmatization. The air quality is affected through smoke from burning of tires and firewood including stinky odor from abattoir wastes. The soil is polluted through run off waters as well as vehicular movements. Insects proliferated around perching on blood and liquid intestinal fluids emptied at the premises. Also stigma is attached to residential properties within and around the abattoir creating fear and anxiety for relocation decision of investors as well as reducing demand and the property values.

Table 4.3 Environmental Problems Found with Abattoir Operations

Environmental Hazard	Outcome	Location
Air Pollution	Air quality (smoke and odor, nuisance)	Burning and washing points
Soil Pollution	Contamination of surface and underground waters, as well as river bodies.	Burning, washing and marketing points
Noise Pollution	High noise from abattoir operators, vehicular movement and livestock	Burning, washing, butchering, transport and marketing points
Proliferation of Insects	Rodents and Flies as a result of blood and liquid intestinal fluid washed and emptied at premises	Burning, washing, dumps and marketing points
Environmental Stigma	Reduce demand, create fear and anxiety, reduce value, induce relocation decision.	Within residential properties proximity to abattoir

Source: Author’s Field Investigation, 2021

4.2 Factors Affecting Prospective Investor Not Investing within the Study Area

Table 4.4 shows the factors influencing prospective investor not to invest in residential property developments in proximity to abattoir operational area. Table 4.4 reveals that there is reduction in values, elastic demand, marketability difficulty, scaring of prospective investors and physical deterioration of property produce weighted sums of 3.31, 3.26, 3.18, 3.16 and 3.15 respectively; while unwillingness to pay rent, relocation decision, increased crime, health hazards, filthy environment and increased demand for basic amenities produce weighted sums of 3.12, 3.10, 3.09, 3.01 and 3.00 respectively. The factors influencing the decision of prospective investors of residential properties not to invest in neighborhood at close proximity to abattoir are detailed in Table 4.4. It implies that the identified variables will significantly affect residential property investment decision at abattoir operational neighborhood.

Table 4.4: Extent of Abattoir Effect on Prospective Investors

Abattoir Effect on Residential Property Values	Weigh: N = 106					$\sum fx$	$\frac{\sum fx}{\sum f}$	%	Rank
	5	4	3	2	1				
Reduced value	25	23	22	21	15	340	3,31	66.2	1 st
Inelastic demand	24	22	21	20	19	330	3.16	63.4	4 th
Marketability difficulty	23	22	22	22	17	330	3.18	63.7	3 rd
Scared prospective investors	24	24	21	21	16	337	3.26	65.2	2 nd
Physical deterioration of property	24	22	21	20	19	330	3.15	63.0	5 th

Unwillingness to pay rent	22	23	22	21	18	328	3.12	62.4	6 th
Relocation decision	23	21	23	19	20	326	3.09	61.8	8 th
Increased crime	24	22	21	20	19	330	3.15	63.0	5 th
Promotes health hazard	23	28	19	20	16	352	3.10	62.0	7 th
Promotes filthy environment	21	21	23	22	19	321	3.01	60.2	9 th
Increased demand for basic amenities	22	21	21	21	21	320	3.00	60.0	10 th

Source: Author’s Field Investigation, 2021

4.3 Average Rental Values in Trans-Amadi Abattoir Neighborhoods

Table 4.5 shows the impact on the environment through current rental values assessment, as it’s affected by abattoir operation in the neighborhoods: Woji, Oginigba and Azuabie-town. The study reveal that the current average rental values of batchers in Woji to be ₦42,000 per annum; Tenement building, ₦102,000 per annum; Self-contained, ₦225,000 per annum; 1bedroom, ₦350,000 per annum and 2bedroom flats, 525,000 per annum. In Oginigba neighborhood, the current average rental values for batcher was ₦35, 000 per annum; tenement buildings, ₦86, 000 per annum; self-contained, ₦200,000 per annum; 1bedroom, ₦225,000 per annum; and 2bedroom, ₦375,000 per annum. Furthermore, at Azuabie town neighborhood, current average rental values for batchers was ₦27,000 per annum, tenement buildings, ₦66,000 per annum; self-contained, ₦165,000 per annum; 1bedroom flat, ₦200,000 per annum; and 2bedroom flat was ₦300,000 per annum. Table 4.5 shows that the current average rental values of residential properties were higher in Woji, moderate in Oginigba and lower in Azuabie-town. The analysis implies that the abattoir operation at Trans-Amadi Abattoir badly affected propertyvalues at Azuabie town and moderate at Oginigba when using Woji neighborhoods as baseline.

Table 4.5: Current Average Rental Values in the Various Neighborhoods

Residential Property Types	Woji (₦)	Oginigba (₦)	Okujagu (₦)
Batchers	42,000.00	35,000.00	27,000.00
Tenement building	102,000.00	86,000.00	66,000.00
Self-contained apartments	225,000.00	190,000.00	165,000.00
1 bedroom apartment	350,000.00	225,000.00	190,000.00
2 bedroom flats	525,000.00	375,000.00	300,000.00

Source: Author’s Field Investigation, 2021.

4.4 Degree of Rent decline on Properties within The Trans-Amadi Abattoir Neighborhood

This illustration shows how environment affect rental value of properties in the neighborhood and as it affect the rent accruing to property owners due to the negative impact of abattoir operation within the residential neighborhoods. Table 4.5 was adopted to establish rate of rent decline, comparing the current average rental values of residential properties in the three (3) neighborhoods. Since the current average rental values in Woji neighborhood was higher than Oginigba and Azuabie town, residential properties in Woji was used as bench mark for this analysis.

Table 4.6 illustrates that a feasible reduction of 16.6% and 35.7% of rent for batcher structures in Oginigba and Azuabie-town respectively as compared to Woji, 15.7% and 35.3% decrease for tenement buildings in Oginigba and Azuabie-town respectively as compared to Woji; 15.5% and 26.7% reduction for self-contained in Oginigba and

Azuabie town respectively as compared to Woji. Also, the table indicates that 35.7% and 47.7% of rent decline for 1bedroom in Oginigba and Azuabie-town respectively; and 28.6% and 42.8% rent decline for 2bedrooms in Oginigba and Azuabie-town respectively. The average rent reduction for residential properties for both Oginigba and Azuabie-town was 26.7% and 39.8% respectively as compare to average rental values in Woji per annum. Due to the proximity of Trans Amadi Abattoir to Azuabie town than Oginigba and Woji, residential properties values were negatively affected in Azuabie Town neighborhood. From observation, it was discovered that most of the effluent discharge both as air and water pollution flow towards Azuabie Town; the direction of the wind, and the flow of surface waters in the river. Most of the smoke and odor from the Abattoir were blown to the direction of Azuabie Town over a good number of years. And this has negatively created greater consequences on the neighborhood of Azuabie Town.

Table 4.6: Degree of Rent Decline on Property Owners

Residential Property Types	Woji		Oginigba		Azuabie-town	
	Amt (₦) p.a	%	Amt (₦) p.a	%	Amt (₦) p.a	%
Batchers	42,000.00	100.0	35,000.00	16.7	27,000.00	35.7
Tenement building	102,000.00	100.0	86,000.00	15.7	66,000.00	35.3
Self-contained apartments	225,000.00	100.0	190,000.00	15.5	165,000.00	26.7
1 bedroom apartment	350,000.00	100.0	225,000.00	35.7	190,000.00	47.7
2 bedroom flats	525,000.00	100.0	375,000.00	28.6	300,000.00	42.8
Average Loss	248,800.00	100.0	182,200.00	26.7	149,600.00	39.8

Table 4.6 above shows the average reduction in rental values for five (5) residential property types; Batchers, Tenement building, Self-contained, 1 bedroom, 2 bedrooms which are predominant housing in the study area. The difference between the average rents for two zones (Oginigba and Azuabie-Town) was obtained through the comparison of the average rental values in Woji neighbourhood

Conclusion

Abattoir operations at the Trans Amadi Abattoir has significantly contributed to the economic development of Port Harcourt Municipality. However, there are serious problems with the conditions under which it's operate. But for the wrong approach to waste disposal and management, the volume of effluent generated at the abattoir potentially has posed serious health implications to the communities within the study area. The study revealed that the methods of waste disposal/management at the abattoir are through washing of blood and intestinal fluid into drain empties in the nearby river or right at the abattoir premises with some left over bones. The study has set the standards to estimates abattoir waste generated for proper waste management. But this can't be achieved due to challenges found in the abattoir operations. The abattoir currently lacks basic facilities, obsolete facilities, lack of government policy enforcement, apathy of government towards it responsibilities. Despite the vast potential of the abattoir, it appears that the limited facilities provided have been run down over the years. It is believed that it will be of higher benefit to the environment if the abattoir is totally relocated to another developing area thereby giving Government and opportunity to design anew to meet global best practice in abattoir facility and waste management /disposal system. Also, mitigation measures should be put in place such as building of the existing road network, provision and improvement on basic infrastructures like road, improve power supply, running water, creating an attractive environment that will build investors confident in the affected area to croup the existing stigma that effects is feasible in the affected neighborhood as revealed through the percentage of rent reduction as seen in the study.

Recommendations

The study recommended improvement in infrastructural provision considering the present rate of urbanization to aid urban renewal scheme and also improve neighborhood quality using the following listed approaches.

- 1. An Executive Order to Relocate Trans-Amadi Abattoir:** The location of the Tran-Amadi Abattoir was good enough some thirty years ago when it was relocated to it presence site, but the vast development and urban sprawl being experience in Port Harcourt over the years has voided the compatibility of this facility in its current location

and as it is today, an executive order for relocation seems to have been over delayed by the executive arm of government and policy makers.

2. Stigma prevention and remediation measures. Environment so widely stigmatized could be difficult to be accepted by investors who care much about returned on their investment. A mitigation process is recommended such that will bring about building of roads, provision of basic amenities such as power, water supply and urban planning in the affected neighborhood which could make the location much more attractive.

3. Adoption of Pollution Prevention Measure: Pollution prevention measure suggested for abattoirs in Nigeria should be adopted. This preventive measure is a product of recovery and waste minimization strategy. This is the process whereby the amount and strength of waste are reduced by dry removal of solid wastes and installation of screens on wastewater collection channels.

4. Education and Public Awareness: Public participation should be encouraged through education and public awareness. The creation of public awareness and enlightenment on possible impact of abattoir pollutants and formulation of new policies for proper checks and better management of abattoir operations through media campaign, gender balance participation, information exchange and networking with the focus of tuning the mind toward acceptability.

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