

but also for the country and international community. The soot first appears as clouds laden with dark particulate matters on the skyline in several parts of the state. But for their blackish nature and the fact that they are not characterized with cooler temperatures, these soot-laden clouds would have been mistaken for harmattan haze. This sight is easily noticed in the morning and evening hours and particularly, between the months of November and March when the rains subside. The menace of the soot is not discriminatory neither is it a respecter of persons and locations as its deposits and particles filter into homes and other closed areas just as it settles on cars, streets, water bodies, wetlands, plants and animals – there is virtually no safe place against soot in the state.

This perhaps lays credence to the April 2018 ranking of Port Harcourt as the worst polluted city in the world with an air index of 188. Similarly, in December 2020, AirVisual ranked Port Harcourt as “very unhealthy” for sensitive groups having attained an air index of 207.817. In what appears to be a trend, AirVisual’s ranking of air quality in Port Harcourt for July, 2021 threw up an air index of 152 far above the standard (0-50) and moderate (51-100) levels. Currently, Air Visual Air Quality Index for Port Harcourt is 150 US AQI and classed as unhealthy for sensitive groups. It went further to state categorically that PM2.5 (Black Soot) is the major pollutant with concentration more than 10.7 times above the WHO annual air quality guideline value (Air Quality Air Visual, 2022). After 76 years of oil exploration and exploitation in the Niger Delta particularly in Rivers State, it is expected, and this has formed the basis of major public outcries, that a comprehensive environmental audit to ascertain how the environment has fared is long overdue. Sadly, this is yet to be successfully done. For this reason, the environmental impact assessment of 76 years of oil exploration and exploitation in Rivers State is somewhat unknown hence not much appreciated. This, perhaps, explains why the issue of black soot pollution in Rivers State which has lingered for about six years is yet to receive the desired attention.

2.6 Concepts of Property and Property Values

Concept of Property

The concept of property has no single or universally accepted definition and various academic disciplines like law, economics, anthropology, and sociology treat the concept more systematically and within or between the different disciplines and field definitions vary.

In common use, property may be regarded as simply one's own thing and it is the relationship between individuals and the objects, which is seen as being the holders' "own" to dispense with as they see fit.

The social scientists conceive property as a bundle of rights and obligations. In the property species, Wilson, (2016), explores how Homo sapiens acquires, perceives, and knows the custom of property, and why it might be relevant to social scientists, philosophers, and legal scholars for understanding how property works in the twenty-first century. Arguing from some hard-to-dispute facts that neither the natural sciences nor the humanities – nor the social sciences squarely in the middle – are synthesizing a full account of property, Wilson offers a cross-disciplinary compromise that is sure to be controversial: Property is a universal and uniquely human custom, (Wilson, 2016).

Elinor, Ostrom and Edella, (1992), identified property as bundles of rights, having five elements of these rights to natural resources that appear in various bundles: access, rights to hike or canoe, for instance, but excluding rights to withdraw resource units; withdrawal, such as the right to catch fish or divert water; management, the right to maintain, improve, and transform a resource; exclusion, the right to decide who has access and withdrawal rights and how those rights are transferred; and alienation, the right to lease or sell exclusion and management rights. The legal concept of "property" refers to the many different kinds of relationship between a person and an object, object rather than the object itself (CB1.5), also Yanner vs Eaton.

Concept of Values

In an attempt to define "value", as widely as possible, it can be referred to as "any consideration, sufficient to support a simple contract", Opara, (2013). Values are standards or

ideals with which we evaluate actions, people, things, or situations. Beauty, honesty, justice, peace, generosity are all examples of values that many people endorse, Lau and Chan, (2014). Values can be defined as broad preferences concerning appropriate courses of actions or outcomes. As such, values reflect a person's sense of right and wrong or what "ought" to be. "Equal rights for all", "Excellence deserves admiration", and "People should be treated with respect and dignity are representatives of values. Values tend to influence attitudes and behavior. a publication by Bankrate, (2019) property value refers to the worth of a piece of real estate based on the price that a buyer and seller agree upon. According to economic theory, the value of a property converges at the point where the forces of supply meet the forces of demand. In other words, the value of a property at any given time is determined by what the market will bear.

2.7 Sources of Soot in the Study Area

Emissions from asphalt plants, combustion of fossil fuels and tyres, vehicular emissions, etc releases gases and chemicals into the air in an especially destructive feedback loop. The introduction of carbon dioxide and other greenhouse gases which are by-products of combustion raises the earth's temperature or rather increases heat. Air pollution not only contributes to climate change but is also exacerbated by it. This increasing warmer weather facilitates smog formation due to atmospheric chain reactions in the presence more ultraviolet radiation. Haze is an atmospheric phenomenon in which dust, smoke and other dry particulates obscure the clarity of the sky.. This results in the pall of aerosols that covered the skies of Port Harcourt metropolis. The implication of the situation is quite varied and can be expressed in the following scenarios: (i) Ecological damage to plants (crops) through deposition of oxides of carbon, nitrogen, sulphur and volatile organic compounds in the aerosols on plant leaves, acidification of soils and water bodies. This will ultimately lead to poor crop/fruit yields, fish catches, dwindling agricultural productivity and livelihoods. (ii) Increased Health Hazards expressed as heightened respiratory diseases especially in children

and the elderly, and the risk of developing mutations, carcinogenesis in the long term and teratogenic possibilities in developing foetuses, as a result of constant inhalation of these carbonised aerosols (iii) Rapid deterioration of amenities such as car chassis, roofing sheets and other metallic and non-metallic materials. (iv) Increased cost of house care as constant cleaning and washing of household ware is required. (v) Reduction in the Aesthetic value of our surroundings, due to the deposition of the black soot on all surfaces. (vi) Black rains!

3.0 Research Method

The study is a survey research, as it seeks to ask the opinions of practitioners, landlord and tenants, on the effects of environmental degradation on real property value in Port Harcourt; the study population was grouped into two, with peculiar questions to their circumstances. The first group consists of real estate firms, because they are in charge of land development and 40 practicing real estate firms in Port Harcourt who indicated having management properties in Abuloma were used , 90 community landlords in charge of the sales of land, in Abuloma, Port Harcourt City Local Government Area. The sample size for the study consist of 130 respondents who were administered questionnaires and 114 of the questionnaires were retrieved giving a response rate of 87.7%.

4.0 Findings of the Study

Sources of Soot Found in the Study Area

Table 1: Response on the sources of soot found in the study area

S/N	Variables	SA	A	UD	D	SD	Σ	Mean
1	Burning fossil fuels like oil refining and smokes from vehicles	39	30	20	16	9	416	3.64
2	Emissions from asphalt plants	50	40	10	10	4	464	4.07
3	Remnants from burned bushes	43	39	15	11	6	444	3.89
4	Burnings from illegals refinery stations	45	29	15	15	10	426	3.73

5	The introduction of carbon dioxide and other greenhouse gases which are by-products of combustion	40	31	19	13	11	418	3.66
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Source: Field Survey, 2022

The table 1 shows the responses of the respondents on the sources of soot found in the study area, there are 5 items on the questionnaire as shown in table 1. First item on Burning fossil fuels like oil refining and smokes from vehicles has a mean score of 3.64, second item on Emissions from asphalt plants mean score is 4.07, third item on Remnants from burned bushes has a mean score of 3.89, fourth item on Burnings from illegal refinery stations has a mean score of 3.73 and finally the fifth item on The introduction of carbon dioxide and other greenhouse gases which are by-products of combustion has a mean score 3.66. From the mean score, it is observed that the responses are all above 2.5 which represent a moderate response to 3.5 which is an indication of a strong response.

Nature of Soot and Its Effects on Property Values in Study Area

Table 2: Response on the nature of soot and its effects on property values in study Area

S/N	Variables	SA	A	UD	D	SD	Σ	Mean
1	The black soot is a type of air pollutant that can have a defect on the body of a building because of its chemical composure	41	40	16	12	5	442	3.87
2	Less property acuirements by tenants due to the effects of black soot on the study area	30	40	15	19	10	403	3.53
3	Tenants who live in areas affected by black soot are likely to generate respiratory diseases	30	54	15	10	5	436	3.82
4	Soot are black in colour and they reduce the value of properties due to its deterioration causes on the building	45	39	20	10	-	461	4.04
5	Areas largely affected by soot depletion results to low populace of living and housing properties in such areas are left retarded	36	34	22	20	2	424	3.71

Source: Field Survey, 2022

The table 2 shows the responses of respondents on nature of soot and its effects on property value in study Area, there are 5 items on the questionnaire as shown in table 2. First item on The black soot is a type of air pollutant that can have a defect on the body of a building because of its chemical composure has a mean score of 3.87, second item on Less property acquirements by tenants due to the effects of black soot on the study area has a mean score of 3.53, third item on Tenants who live in areas affected by black soot are likely to generate respiratory diseases has a mean score 3.82, fourth item on Soot are black in colour and they reduce the value of properties due to its deterioration causes on the building has a mean score of 4.04 and finally the fifth item on Areas largely affected by soot depletion results to low populace of living and housing properties in such areas are left retarded has a mean score of 3.71. From the mean score, it is observed that the responses are all above 2.5 which represent a moderate response to 3.5 which is an indication of a strong response.

Challenges of soot on the physical properties in the study area

Table 3: Response on the challenges of soot on the physical properties in the study area

S/N	Variables	SA	A	UD	D	SD	Σ	Mean
1	Soot deposits in homes and surrounding environments reduces the rate of property development	44	30	20	10	10	422	3.70
2	Residential property prices have increasingly been influenced by the quality of air and its deterioration therefore, affects urban property values	50	39	15	0	10	461	4.04
3	Environments with high degradation results to poor purchase of properties	40	39	11	14	10	427	3.75
4	Tenants avoid acquiring properties in areas with high level of environmental degradation	32	33	24	18	7	407	3.57
5	The rate of property development is measured by the level of environmental degradation	44	30	15	20	5	430	3.77

Source: Field Survey, 2022

The table 3 shows the responses of respondents on the challenges of soot on the physical properties in the study area and there are 5 items on the questionnaire as shown in table 3. First item on Soot deposits in homes and surrounding environments reduces the rate of property development has a mean score of 3.70, second item on Residential property prices have increasingly been influenced by the quality of air and its deterioration therefore, affects urban property values has a mean score of 4.04, third item on Environments with high degradation results to poor purchase of properties has a mean score of 3.75, fourth item on Tenants avoid acquiring properties in areas with high level of environmental degradation has a mean score of 3.57 and finally fifth item on The rate of property development is measured by the level of environmental degradation has a mean score of 3.77. From the mean score, it is observed that the responses are all above 2.5 which represent a moderate response to 3.5 which is an indication of a strong response.

The Impact of Soot on Property Value in Study Area

Table 4.7: Response on the impact of soot on property value in study area

S/N	Variables	SA	A	UD	D	SD	Σ	Mean
1	Tenants are willing to pay high for a property in an environment with improved air quality	30	29	28	17	10	394	3.45
2	One of the ways to improve the values of property is by effective pollution control	29	40	15	20	10	400	3.51
3	The decision to buy a home is measured by environmental quality	20	36	20	28	10	415	3.64
4	Proper soot management helps in the development of property values	29	40	23	13	9	409	3.58

Source: Field Survey, 2022

The table 4 shows the responses of respondents on the impact of soot on property value in study area and there are 4 items on the questionnaire as shown in table 4 First item on Tenants are willing to pay high for a property in an environment with improved air quality

has a mean score of 3.45, second item on One of the ways to improve the values of property is by effective pollution control has a mean score of 3.51, third item on The decision to buy a home is measured by environmental quality has a mean score of 3.64 and finally the fourth item on Proper soot management helps in the development of property values has a mean score of 3.58. From the mean score, it is observed that the responses are all above 2.5 which represent a moderate response to 3.5 which is an indication of a strong response.

5.0 Discussion of Findings

The study revealed that burning fossil fuels like oil refining and smokes from vehicles, emissions from asphalt plants are some of the sources of soot found in the study area. This study is in line with Carter, (2019), who concluded that Emissions from asphalt plants, combustion of fossil fuels and tyres, vehicular emissions, etc. releases gases and chemicals into the air in an especially destructive feedback loop. The introduction of carbon dioxide and other greenhouse gases which are by-products of combustion raises the earth's temperature or rather increases heat.

The study also revealed that black soot is a type of air pollutant that can have a defect on the body of a building because of its chemical composition, less property acquisitions by tenants due to the effects of black soot on the study area, soot are black in colour and they reduce the value of properties due to its deterioration causes on the building. This was in agreement with American Public Health Association, (2020), who viewed that the nature of soot found in the study area is the black soot. The black soot is a type of air pollutant. Its diameter is about 2.5mm. As a pollutant, it comprises a variety of other pollutants like chemical acids, metals, and dust particles. Over the years, soot has been classified as a threat to public health as public health generally, is concerned with promoting and protecting the health of people and the community where they live, learn, work and play.

The study further revealed that soot deposits in homes and surrounding environments reduces the rate of property development, residential property prices have increasingly been influenced by the quality of air and its deterioration therefore, affects urban property values, environments with high degradation results to poor purchase of properties. This finding was in line with Zavadskas *et al.*, (2007), who identified that Property prices differed depending on property location from the source of pollution, whereby it exerts a rather sizeable influence on property prices.

Finally, study revealed that the decision to buy a home is measured by environmental quality; proper soot management helps in the development of property values. This finding is in line with McCluskey and Rausser (2003), who viewed that residential property owners in close proximity to the hazardous waste site experienced lower housing appreciation rates.

6.0 Conclusion

From the findings the researchers concluded that:

The Effects of Environmental Degradation on Property Value in Abuloma Area of Rivers State includes factors such as residential property values are reduced by increased proximity to hazardous waste sites, property prices differed depending on property location from the source of pollution, whereby it exerts a rather sizeable influence on property prices, Soot deposits in homes and surrounding environments reduces the rate of property development, Tenants avoid acquiring properties in areas with high level of environmental degradation, The decision to buy a home is measured by environmental quality.

Based on the findings of this study and conclusions drawn, the following recommendations were made:

7.0 Recommendations

1. The Federal Government of Nigeria should ensure that regulatory bodies in charge pollution control such as soot carry out their functions effectively and efficiently to eradicate cases of low property values due to soot.

2. Property investors should erect properties in areas far from environmental pollution which increases the number of tenant population and in turn promotes property developments.
3. Real estate valuers should ensure that clients are advised properly on location of their investments and the need to carry out environmental assessment before investment is carried out.



References

- Abumere, F. (2002). *The Nigerian Environment*, National Open University of Nigeria, Lagos. *The Reagent Printing and Publishing Company*. p213
- Acho, T. (1998). Trans-West African Gas pipeline to stop Global warming. *The Global South Journal*. 2 (3), 105-113.
- Agbola, S. C. & Agbola, G. (1997). *Environmental Pollution and Control in Chemical Process Industries* (2nd Ed.) New Delhi: Khanna Publishers. p1273.
- Areola, R. (2001). Effects of Gas Flaring on the Soil, Air and Water Quality of Obigbo North. *Centre for Env. And Science Education*. Lagos State University 153p.
- Carter, R. (2019). Health Issues Concerning Inhalation of Petroleum diesel and biodiesel exhaust. In *Plant oil as fuels: Present State of Science and Future developments* (Martini, N. and J. Schell eds) Berlin : Springer. p92-103.

- Efobi, H. (2004). *Environmental Economics: An Indian Perspective*. New Delhi: Oxford University Press.
- FGN, (2008). "Simulation of Air Pollution in a Wind Tunnel". In: *Spectroscopy from Space*. (Demaison, J., Ed.), Kluwer Academic, Dordrecht, 275-299.
- FRN, (2007). "Integrating Uncertainty Theories with GIS for Modeling Coastal Hazards of Climate Change." *Marine Geodesy*, 26, 5-18.
- Hales, O. (2000). "Laser Photoacoustic Spectrometry and its Application for Simulation of Air Pollution in a wind tunnel". *Analyst*, 124, 1205-1208.
- Ibrahim, K. (2013). *Hedonic Property Prices and Valuation of Benefits from Reducin Urban Air Pollution in India*. Institute of Economic Growth, Delhi University, Enclave, pp. 1 – 27.
- Johnson, B. (2002). Effects of occupational exposure to noise and dust on blood pressure in Chinese industrial workers. *A review on Clinical and Experimental Hypertension*, 40, 257- 261.
- Marmot, R. (2006). Assessment of nuisance from deposited dust particulates using a simple and inexpensive measuring system. *Clean Air*, 11, 77-81.
- Mercado, T. (2008). Ensuring environmental sustainability through STEM education: a strategy towards attaining the 7th millennium development goal. *Science Teachers Association of Nigeria (STAN) 54th Annual Conference Proceeding*, pp. 284.
- Muoghalu, O. (2004). Bioaccumulation of heavy metals by yeasts from Qua Iboe estuary mangrove sediment ecosystem, Nigeria. *African Journal of Microbiology Research*, Vol.3 (12), pp. 862-869.
- National Population Commission, NPC, (2008). Comparative assessment of rainwater and groundwater quality in an oil producing area of Nigeria: environmental and health implications. *Journal of Environmental Health Resources*, (6) 2. Pp. 111-118.
- Nwachukwu, N., Chukwuocha, K. & Igbudu, D. (2012). "Gas flaring in Nigeria: Analysis of changes in its consequent carbon emission and reporting," *Accounting Forum*. 37(2), pp. 124-134
- Scott, Y. & Canter, L. (1997). Air quality in the vicinity of a landfill site in Rumuolumeni, Port Harcourt, Nigeria. *Journal of environment and earth science* (14)(10).
- Singh, R. (2003). Exposure to heavy metals in soot samples and cancer assessment in Port Harcourt, Nigeria. *Journal health pollution* 9(24). (2019 proceedings of the America national academy of science.
- Wilson, N. (2016). Effects of occupational exposure to noise and dust on blood pressure in Chinese industrial workers. *Clinical and Experimental Hypertension*, 40, 257- 261.
- World Bank Report (1980). *Environment ethics and human health*. Hastings canter bioethics briefing.