

**Pollution and the Urban Aesthetics in the Industrial Districts of Lagos,
Nigeria; Any Correlation?**

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Abstract

The paper examines the reciprocal tendencies between the environmental pollution and the urban aesthetics in the industrial districts of Lagos, Nigeria. A total of two hundred and forty questionnaires were randomly administered in twelve industrial districts of the Lagos region. Data were descriptively and inferentially analyzed. Also, secondary sources of data were adopted. The study posits that urban aesthetics could be understood from the perspective of industrial pollution. The paper reveals the following types of pollution as potent and influencing on the urban aesthetics; air, water and land pollution. The research bewrays the pertinence of the following indices to urban aesthetics; clean water and air, infrastructures, housing, health and sanitary environment. The canonical correlation analysis between the industrial pollution and the urban aesthetics revealed a value 3.6358 which was significant at 0.05 levels. The paper recommends a massive public enlightenment campaign to educate the masses; especially the entrepreneurs on the essence of curtailing pollution; while developmental activities should be carried out in a way that will make the cities livable and sustain urban aesthetics. Finally governments should strictly enforce the environmental laws.

Key Words: Environmental pollution, urban aesthetics, Industrial districts, Lagos region

Introduction

Industrial pollution as a result of human activities has posed a serious problem, not in Nigeria alone but globally. Pollution could be very harmful to human beings, livelihoods, animal and plant lives; it also has a serious consequence on sustainable development. Industrialization and advancement in science and innovation coupled with advancement in transportation and building construction has significantly contributed to increasing industrial, human wastes and effluents culminating to environmental degradation and pollution, such as water pollution, noise pollution, land pollution, urban heat and urban sprawl. The consequence of urban heat and sprawl is loss of green area. Pollution poses a serious challenges contributing to deteriorating quality of air, water, land and forests and therefore, there is the need to stem pollution, which constitute a great menace to these vital components of urban aesthetic.

Urban aesthetic is an essential component of the urban realm, circumscribed by the prevailing contemporary reality. Urban aesthetic is the assemblage of structures that form an interrelated whole, the city, it fosters understanding quantitative approaches and qualitative analyses that aspire to determine the value of visual and non-visual aesthetic characteristics. Urban aesthetic includes the smells, its noises, its taste, its sights as well as the unseen history. Components of urban aesthetics include; clean air, clean water, land as well as the physical, natural and artificial entities of the environments.

Regional clusters may be used as a catch-word for older concepts like industrial districts, specialized industrial agglomerations and local production systems. A regional cluster may be defined as a geographically bounded concentration of interdependent firms. According to Rosenfeld (1997) a "cluster should have active channels for business transactions, dialogue and communication". Without active channels even a critical mass of related firms is not a local production or social system and therefore does not operate as a cluster. It is argued that regional clusters are the best environment for stimulating innovation and competitiveness of firms (Ashem and Isaksen 2000). Krugman (1993) has argued that concentration is the most striking feature of the geography of economic

activities and has its benefits. So having production and resources already concentrated in a region gives a region a competitiveness advantage. Clusters are specialized in a small number of industries, reflecting the mere general point that economic, entrepreneurial and technological activities in specific industrial sectors tend to agglomerate at certain places (Malmberg, 1996; Strange, 2008). The implied agglomeration, externalities or economies across firms in an industry or sector may be due to various forces, including a conglomeration of specialized inputs and informational or knowledge spillovers. Externalities are costs and benefits of transactions that are not reflected in prices. Pollution is the most commonly used example of a negative externality. Scitovsky (1954) first developed a conceptual framework to distinguish two different types of externalities according to how they are mediated, first technological externalities and pecuniary externalities. Though, there are lots of benefits derived as a result of industrial cluster, it also has negative effects such as overcrowding, pollution, high cost of land and traffic congestion, Vibration, irritating fumes, increase in house rent, crime rate increase. This paper therefore, posits that urban aesthetics could be further analyzed from the perspective of industrial pollution, using Lagos industrial districts as a case study.

Conceptual Issues/ Literature Review

Despite all the advantages that are enjoyed as a result of industrial concentration in a region, there are some negative consequences, such as overcrowding, high cost of living and environmental pollution, Fagbohunka (2015). Industrial cluster has generated a surge of interest among environmentalist and planners who are interested in its environmental impacts. In recent years, scholars such as Wheeler (2009) have tried to analyze the correlation between environmental damage, and the growth of firms particularly in developing countries where the growth has been phenomenal. Ofomata (2001) agreed no less with the assertion that "the rapid population growth in Nigeria resulting in increase in production, urbanization and industrialization, which are of course, resource- based development and its attendant pressure have led to

environmental degradation in Nigeria". Okude (1999); Fagbohunka (2015) emphasized that the stress which have of course, been associated with the use and mis-use of the environment, have manifested in pollution, sudden change, ozone depletion, congestion, flooding and erosion and many others. Industrial pollution has significant effect on the environment, ranging from human health, water resources, infrastructure and transportation, Fagbohunka (2015). Powel (1996) have argued that the concern about environmental awareness through environmental education dates back to John Evelyn's work of 1664. He identified others (such as Sir Matthew Hale, 1667, John Ray (1661); Adam Smith, (1776); Perkins Marsh, 1864; e.t.c.) that have made the impact on the move towards the endless search for reconciliation between uses of the God given resources. In recent years, Scholars such as Bloom (2007) have tried to analyze the correlation between environmental damage and the growth of firms particularly in developing countries where the growth has been phenomenal. According to Scott (2006) the environmental impacts of firms in the developing world have tended to be ignored, although the promotion of such enterprises is seen as a way to provide employment and incomes, there is little evidence available on environmental impact and sustainability. There is indeed the general assumption that because they are development facilitators, these industries have little impacts.

The Study Area and Methods

Lagos region which is situated along the south west of Nigeria, approximately between latitudes 6°27' and 6°37' north of the equator and longitudes 3°15' and 3°47' east of Greenwich meridian, with a land area of about 1,088km², covers about 32 percent of the land area of Lagos state. Lagos region is the leading, industrial, commercial, financial and maritime nerve-centre of the country. It is, in part, the recognition of the marked concentration of industries in the Lagos region that informed its choice as the study area for this work.

Three major factors account for the subsequent growth of the Lagos region over time. These factors are (i) the construction, in 1958, of the railway as the most important means of linking the city (the port) with a rich hinterland, (ii) the development of the Lagos harbor into the largest along the west African coast 1908 and 1917, and (iii) the construction in 1900, of carter bridge (reconstruction in 1933 and 1979 to link the Island with the mainland and the hinterland. In addition to this is the official commissioning of the third Mainland Bridge in 1992, to link Lagos Island with Oworonshoki, which has since become another growth point in the Lagos region. The core of the state and a highly urbanized local government areas consisting of Lagos Island, Lagos Mainland, Surulere, Apapa and Eti-Osa. The centre and most developed of this chain of Island is Lagos Island. Lagos provides a good outlet for goods from the hinterland transported by rails, road and the waterways through the Lagos harbour. The Lagos state population figure for the 2006 national population census is 8,048,430.

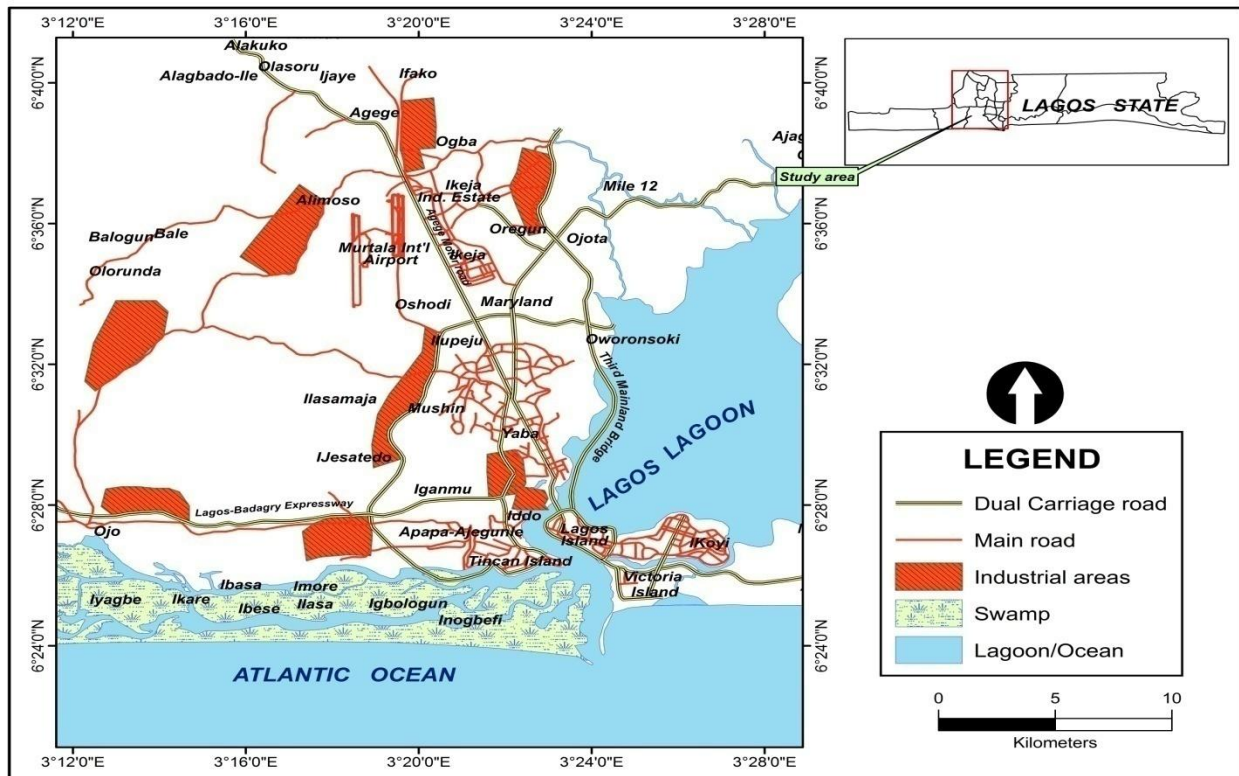


Figure 1: Lagos Showing Industrial Estate Areas

Source: Author's Analysis, 2017.

A total of two hundred and forty questionnaires were randomly administered in the immediate environment of twelve industrial districts of the Lagos region, namely; Apapa, Matori, Agbara, Ikeja, Ilupeju, Ijora, Iganmu, Oshodi/Isolo, Ogba, Ikorodu, Oregun, Surulere/ Mushin. Twenty questionnaires were randomly administered in the immediate environment of each of these districts. In addition to the use of primary data, secondary data also served as a complement.

Findings

Table 1: Demographic Characteristic of Respondents

1.	Sex	Number	Percentages
	Male	180	75
	Female	60	25
2.	Age (in years)		
	Less than 20	10	04
	21-30	48	20
	31-40	64	27
	41-50	48	20
	51 – 60	37	15
	Above 60	33	14
3.	Occupation		
	Farming	19	08
	Civil servants	64	27
	Trading	87	36
	Others	70	29
4.	Level of Education		
	No Formal education	06	03
	Primary education	63	26
	Secondary Education	75	31
	Tertiary Education	96	40

Field Survey, 2017.

Table 1 reveals the demographic characteristics of the respondents, 180(75%) were males, 60(25%) were females. Also, 64(27%) respondents were between 31 and 40 years, while 10(04%) were less than 10 years. Furthermore, 87(36%) were traders, whereas 19(08%) were farmers. Seventy five (31%) have secondary education, compared to 6(3%) that have no formal education.

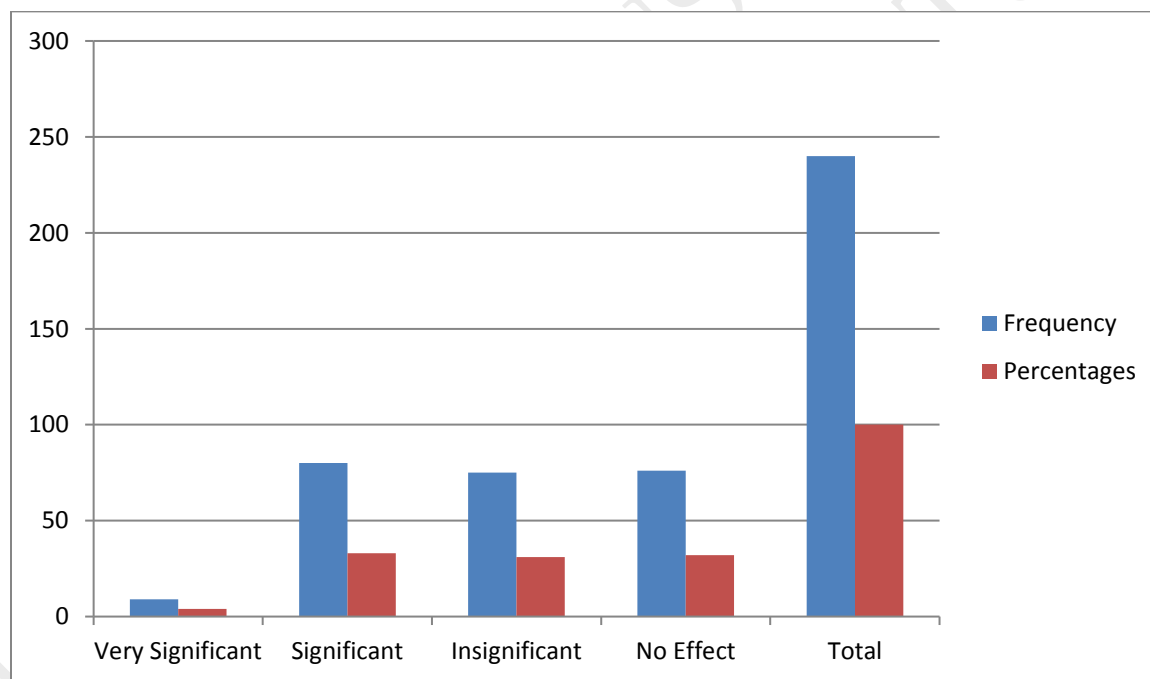
Table 2: Effects of Air Pollution on the urban Aesthetics

Effects	Frequency	Percentage
Very severe	52	21
Severe	95	40
Not severe	75	31
No effect	18	08
Total	240	100

Source: Author’s Analysis, 2017.

Table 2 depicts the effects of air pollution on the urban aesthetics, 95(40%) opined that air pollution is severe, while 52(21%) believed that it is very severe. Another, 75(31%) agreed that the air pollution is not severe on the urban aesthetics, whereas 18(08%) opined that air pollution has no effect.

Figure 2: Significance of Water Pollution on the urban Aesthetics



Source: Author’s Analysis, 2017.

Fig. 2 shows the significance of water pollution on the urban aesthetics, out of 240(100%) respondents, 80(33%) agreed that water pollution is significant, while 09(04%) opined very significant. Furthermore, 75(31%) believed that water pollution is

insignificant, whereas 76(32%) agreed that water pollution has no effect on the urban aesthetics.

Table 3: Effects of Thermal Pollution on the urban Aesthetics

Effects	Frequency	Percentage
Positive	12	05
Negative	35	15
No effect	193	80
Total	240	100

Source: Author's Analysis, 2017.

Table 3 reveals that 12(05%) respondents believed that thermal pollution has positive effects on the urban aesthetics, while 35(15%) agreed that it has negative effect. Also, 193(80%) agreed that thermal pollution has no effect on the urban aesthetics.

Table 4: Significance of Land Pollution on the urban Aesthetics

Effects	Frequency	Percentage
Very Significant	54	22
Significant	95	40
Insignificant	49	20
No effect	42	18
Total	240	100

Source: Author's Analysis, 2017.

Table 4 shows that 54 (22%) respondents agreed that land pollution has a very significant effect on the urban aesthetics, while 42(18%) believed that it has no effect. Another, 95(40%) opined that land pollution is significant, whereas 49(20%) believed that land pollution has no effect on the urban aesthetics.

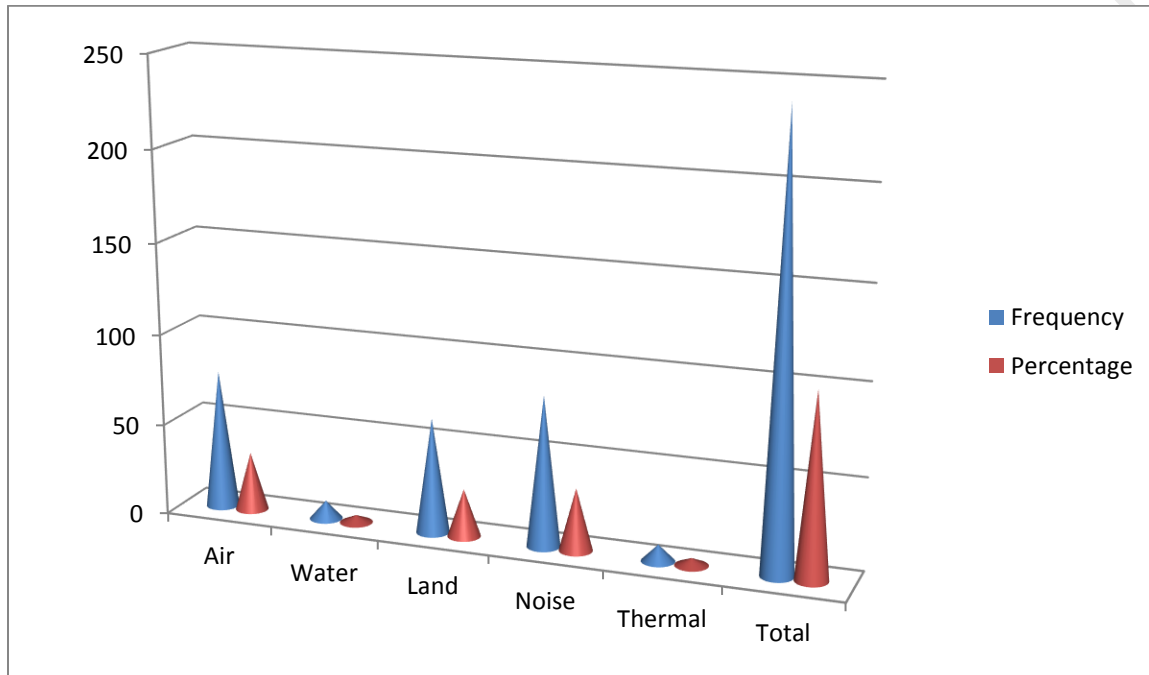
Table 5: Severity of Noise pollution on the urban Aesthetics

Effects	Frequency	Percentage
Very Severe	68	28
Severe	96	40
Not severe	40	17
No effect	36	15
Total	240	100

Source: Author's Analysis, 2017.

Table 5 reveals that 68(28%) respondents agreed that noise pollution is very severe on the urban aesthetics, while 40(17%) opined it is not severe. Another, 96(40%) opined that noise pollution is severe, whereas 36(15%) agreed that noise pollution has no effect.

Figure 3: Dominant Pollution influencing the urban Aesthetics



Source: Author's Analysis, 2017.

Fig. 3 depicts the dominant pollution influencing the urban aesthetics. Out of 240(100%) respondents, 82(34%) believed that noise pollution is dominant, whereas 9(04%) opined thermal pollution. Also, 76(32%) agreed that air pollution is dominant compared to 63(26%) respondents who believed that land pollution is dominant.

Table 6: Crosstabulation of Respondents Perception of industrial pollution on the Urban Aesthetics

Pollutions	Very severe		Severe		Not Severe		No Effect		Total	
	No	%	No	%	No	%	No	%	No	%
Air	-	-	47	19.6	11	4.6	17	07	75	31
Noise	23	9.6	37	15	11	4.6	11	4.6	82	34
Water	-	-	-	-	7	2.9	12	05	19	08
Land	5	02	26	10.8	5	02	09	3.8	45	19
Thermal	-	-	-	-	06	2.5	13	5.4	19	08
Total	28	11.7	110	45.8	40	16.7	62	25.8	240	100

Source: Author’s analysis, 2017.

Table 6 shows the crosstabulation of respondent’s perception of environmental pollution on the urban aesthetics. Forty seven (19.6%) attested that air pollution is severe on the urban aesthetics, compared to 37(15%) who opined that noise pollution is severe on urban aesthetics. Another, 23(9.6%) believed that noise pollution is very severe, as opposed to 5(02%) who agreed that land pollution is very severe. Furthermore, 17(07%) respondents believed that air pollution has no effect on urban aesthetics, whereas 11(4.6%) agreed that noise pollution has no effect on the urban aesthetic

Table 7: Ranking of Urban Aesthetics in order of Importance

Advantages	Very important		Important		Not important		Total	%
	No.	%	No.	%	No.	%		
							240	100
Clean water	38	15.8	05	2.1	-	-	43	17.9
Air	39	16.3	07	2.9	-	-	46	19.2
Infrastructures	24	10	12	05	-	-	36	15
Housing	33	13.8	11	4.6	-	-	44	18.3
Health	40	16.7	01	0.4	-	-	41	17.1
Sanitary environment	20	08	10	4.2	-	-	30	12.5

Source: Author’s Analysis, 2017

Table 7 shows the ranking of the urban aesthetics in order of importance. It is very apparent that all the urban aesthetics indices were considered, important and very important. For instance, 38(15.8%) respondents believed that clean water is very important as compared to 39(16.3%) respondents who believed that air is very important. Also, 12(05%) considered infrastructures as important, while 11(4.6%) respondents agreed that housing is important. Interestingly none of the respondents considered any of the urban aesthetics as not important.

Table 8: Government Efforts in Curtailing Industrial Pollution

Effects	Frequency	Percentage
Adequate	17	07
Inadequate	125	52
Grossly Inadequate	60	25
Nil	38	16
Total	240	100

Source: Author’s Analysis, 2017.

Table 8 reveals government efforts in curtailing industrial pollution, 125(52%) agreed inadequate government efforts, while 60(25%) opined that government efforts is grossly inadequate. Seventeen (07%) respondents believed that government efforts are adequate in curtailing industrial pollution.

Table 9 shows the result of Canonical Correlation Analysis of industrial pollution and urban aesthetics. It reveals that industrial pollution have a stronger variation coefficient, with r value of 0.9213, r² value of 0.84879 and 85% variance, while the structural characteristics has r value of 0.7621, r² value of 0.5808 and 58% of variance.

The Roy’s Largest Root Test depicted in table 10 was employed to test for the significance of the canonical correlations at 0.05 significant levels; result of the test shows the calculated F-value 3.6358 and the tabulated F-value 2.85. The calculated F-value is greater than the tabulated value; this suggests that urban aesthetics is significantly influenced by pollution in the Lagos industrial districts.

TABLE 9: Summary of result of Canonical Correlation Analysis.

Variables	Canonical Correlation			Decision
	(r)	r ²	% of variance	
Set I Accept H ₁				
Y ₁₋₁₁	0.9213	0.85	71%	
Set II				
X ₁₁₁ – X ₅₅₅	0.7621	0.58	60%	

Source: Author’s Analysis, 2017.

TABLE 10: Roy’s Largest Root Test of Significant

R	df _r	df _e	Level of Significant	Calc. F	Tab. F.	Decision
0.9213						
0.7621	9	7	5%	3.6358	2.85	H ₁ is accepted

Source: Author’s Analysis, 2017.

Summary and Conclusion

The paper has investigated the correlation between pollution and urban aesthetics in the Lagos industrial districts of Nigeria. Perhaps, it is this strategic position of the Lagos region within the country, which explains why industrial concerns and trading companies are concentrated in this region. The research has shown that industries were concentrated in Apapa, Matori, Agbara, Ikeja, Ilupeju, Ijora, Iganmu, Oshodi/Isolo, Ogba, Ikorodu, Oregun, Surulere/ Mushin (Lagos industrial districts). Despite the facts that industrialization is a panacea to socio-economic development of the region, there are some negative consequences.

The paper has underscored the correlation of the industrial pollution and urban aesthetics. The research has found out that air pollution and water pollution is severe and significant respectively. Thermal pollution was considered as having no influence on the urban aesthetics. Land pollution was also considered to have a significant effect, while air pollution was believed to having a severe impact on the urban aesthetics. Noise pollution was considered to be the most dominant affecting the urban aesthetics. On the aggregate level, the paper has reveals that industrial pollution is severe on the urban aesthetics. The ranking of the urban aesthetics in order of importance has shown that all the urban aesthetics indices were considered, important and very important respectively. It was evident from the research that government is not doing enough to curtail industrial pollution in the region. The canonical correlation analysis between the environmental pollution and the urban aesthetics revealed a value 3.6358 which was significant at 0.05 levels. This further lends credence to the fact that there is correlation between the pollution and the urban aesthetics in the industrial districts of Lagos. Meaning that the activities of these industries negatively affect the urban aesthetics.

It must be noted that the growth in urbanization and industrial development coupled with improper pollution and waste management control, have added a great dimension to land area pollution in Nigeria and other developing countries. Despite the facts that a number of laws and acts to protect the environments have been passed since independence in Nigeria, these laws, acts and environmental policies need to be further reingovorated and strengthened by the government. Also, it is recommended that massive public enlightenment campaign should be embarked on by the government to educate the masses; especially the entrepreneurs on the essence of curtailing pollution; while developmental activities by government at the federal, state and local levels coupled with corporate and private interests should be carried out in a way that will make the cities livable and sustain urban aesthetics.

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