THE DIMENSIONS OF ENVIRONMENTAL POLLUTION IN LAGOS METROPOLIS, NIGERIA

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ABSTRACT

Care for the environment has gradually become monumental responsibility among countries of the world. This goal is of utmost significance for achieving 'sustainable consumption', 'sustainable communities' 'sustainable future', and 'sustainable world'. Thus, this study presents a sociological analysis of the dimensions of environmental pollution with the motive to provide practical information on the process of waste discharge in Lagos metropolis, Nigeria. Also, to empirically showcase the *culture of coping with pollution* that is almost absence in contemporary study. The study adopts descriptive survey design in which questionnaire and in-depth interviews are methods used for data collection while data analysis was carried out using descriptive statistics and content analysis. The result revealed that there is strong correlation between wastes production, disposal and pollution in Lagos metropolis. As such, a majority of the residents, specifically those living in polluted environs, develops coping strategies to survive living in polluted environment.

Keywords: Environment, Pollution, Culture, People, Development

INTRODUCTION

The term 'environment' has been defined to mean the aggregate of geographical, physical, biological, socio-cultural, political setting that determine one's survival and the ability to meet existential developmental needs. In simple expression, Einstein interprets the environment to mean "everything that is not me" (see Singh, 1995). This simply means that environment comprises of entire surrounding, space or condition that encircles an organism, species or race; without which survival will be impossible (Aluko, 2001; Adesiyan, 2005). The growth, life and death of all living beings depend on the environment in which they exist. Therefore, it is imperative for everyone to protect the environment thus our world. This study presents the dimensions of environmental pollution in Lagos metropolis, Nigeria with the motive to provide practical information on the process of waste discharge, public perception and coping strategies of the people in Lagos metropolis, Nigeria.

The essence of environment in the process of achieving sustainable development cannot be underrated. Proponents of sustainable development also affirmed that without productive environment to provide a resource foundation, it would be difficult or impossible to envision attaining sustainable society (Kate, Parris and Leiserowitz 2005; Morelli, 2011). For a fact, this posture fully captures the dynamic nature of development which goes beyond the lines of what poor nations should do to become richer, or asking of development assistance, to a well encompass focus on the inseparable connection between environment, social and economic development. It equally led to the popularization of sustainable development as a concept, goal and movement towards building the capacity of current generation to meet its needs and develop without jeopardizing the opportunity of the future generations to meet theirs and develop (Brundtland 1987, UNDP 2006; Stoddart, 2011; Akanle, 2014). This is also inherent in the concept of *Green Development* which stands to uphold the motion that development must resonate with the environment in friendly manner. In other words, sustainable development is a kind of developmental approach that promotes intergenerational equity, accessibility, compatibility and quality control of the environment. It also includes concerted efforts to achieve improved quality of life for all, and to enable multi-stakeholder groups to define their vision of sustainability and work towards it. This, according to Hill, McMillan, Farina (2003) has the following features:

- An ethical, empowered and personally fulfilled individuals
- A well-defined community built on collaborative engagement, tolerance and equity
- A sound social system and institutions that is participatory, transparent and just
- Perception of environment practices that value and sustain biodiversity and life-supporting ecological processes

The United Nations Development Programme (2006) emphasized that environment is the source of global economy thus it must be protected and sustainably managed. Environment in this context can be classified into micro and macro levels. The micro level environment includes social, psychological, family related environment, architectural beauties of buildings and gardens (Bronfenbrenner and Crouter, 1983). Others included human likes and dislikes, stress and enjoyment, privacy and effect of crowding ambience (Macionis, 2005).

On the other hand, macro level of human environment encompasses rivers, biodiversity, forests, seas, marine resources, dams, energy, ozone layer and the likes (Adesiyan, 2005). However, both the micro and macro levels of environment interact with each other to influence wellbeing of living beings as well as societal development (Adesiyan, 2005; Adewolu, Akintola,

Jimoh, Owodehinde, Whennu and Fakoya, 2009). Due to the growing rate of environmental inequalities and its associated social vulnerabilities in the world, there is need for international organizations, national institutions, corporate enterprises to collaborate and develops proactive measures and regulations that can save the environment from further degradation (see UNCED 2002; FoE 2005) with motive to have a just and caring environment. This process of environmental resurgences is what we referred to as *Care for the Environment* similar to what other authors called 'Green Environment' or 'Sustainable Environment'- an ideological stance stemming from the relevance of the environmental compatibility with cultural, physical, social, technological, economic and structural elements that made up the social system in the context of attaining 'sustainable consumption', 'sustainable communities' 'sustainable future', and 'sustainable world'.

Unfortunately, altitude for care for the environment among urban residents in Nigeria is still very low or almost not existing at all. The way environmental resources (i.e. air, water and land) are being abused on daily basis in Lagos, Nigeria has been a great concern for discerning individual, researchers, organizations and governments who spend huge resources (time, money, materials and mental power) on ecological, infrastructural and health-related matters just to ensure sustainable life, livelihood and development. Let's take a cursory look at some academic reports on environmental pollution in Lagos State, Nigeria. Okebukola (2001) reported that haphazard disposal of gaseous-chemical waste is a major determinant for the spread of gastrointestinal and parasitic diseases in Lagos State. In another study conducted by Adewole (2009), it was revealed that about 10,000 M^3 of untreated industrial waste-water are being discharged into Lagos lagoon on daily basis which result in high rate of water contamination, freshwater shortage and water-related diseases. Similarly, Akanni (2010) reported that the high volume of noise pollution from places of worship with amplified, motorists, machines and frequent use of power generators in industries and households led to growing numbers of people (particularly those living and working around noisy environs) with hearing difficulties, high blood pressure and other deadly diseases in Lagos metropolis, Nigeria.

More so, Solaja, Omobowale and Kalejaiye (2014) reported that solid-metal waste materials are unethically discharged on fallow land, around residential houses, public space and even under the overhead bridges in some parts of Lagos metropolis, Nigeria. This amounted to rising spread of bad odour in public places and inhalation of this odur can cause severe damage to the survival of living beings in the State. Noteworthy, is the fact that the consequences of air pollution is not only localized but also materialized in cross-regional and global dimensions as environment is generous in its distribution of consequences of air pollution across geographical locations (Buchheim, 2004; Kreis, 2006). The basic concern here is that pollution will inevitably undermine the process of achieving sustainable environment which do lead to development in Nigeria. Indeed, there is utmost need to care for the environment in as much as it is the home for all living beings and any other things that depends on the environment for survival. It is important at this juncture to recall Adelakun (2003) who submitted that promotion of environmental quality depends on how individual and community see themselves in relation to their environment. Because, it is the way people perceive the environment that they treat it. And it is the way the environment is treated that will in turn influence life. Thus, this study presents the dimensions of environmental pollution with the motive to provide practical information on the rising neighborhood risks affecting sustainable environment in Lagos metropolis, Nigeria. The purpose of this study therefore is to examine the nature of environmental pollution in Lagos Metropolis with the intention of revealing the process of waste discharge, public perception and coping strategies of the people in the Lagos metropolis. The consequence of the coping mechanism would also be identified.

Previous Studies/Concept of Environmental Resources

Human environment is endowed with essential resources that nourishes and sustains life of all living beings. Mismanagement of these resources has effects with vast implication on the wellbeing of humans, plants, animals and the environment itself. Environmental resources are often classified as natural (such as air, land, water, vegetation etc) and minerals (such as crude oil, gold, zinc, copper etc.) embedded in the physical composition of the environment. To a large extent, these resources play essential role in the process of developing social institutions, artifacts, science, technology and dreams to fashion an environment obedient to human purpose and direction.

However, studies have proved that environmental resources are 'finite resources' (that is they are limited in quality and quantity) and can be exhausted, especially when human activities is pursued at the expense of the environment (Meadows, Meadows, Randers, and Behrens, 1972; Livernash and Rodenburg 1998). Owing to this posture, proponents of neo-Malthusian environmentalism launched the *Limit to Growth* hypothesis (Meadows, Meadows, Randers, and Behrens, 1972). According to Meadows et, al. (1972) the pioneers of *Limit to Growth* thesis, Earth's finite resources (i.e. supply of oil, natural gas, and other energy sources) are falling sharply and will continue to drop if there is no conservation policies to control production consumption rate of environmental resources in industrialized societies. It is in light of this, Brown, Lenssen, and Kane (1995) categorically affirmed that natural environment has reached a limit and has begun to give "vital signs" to show that human overexploitation of natural and mineral resources in guise of development can destroy the earth. It is in this womb that the embryo of contemporary environmentalism began to fertilize (Mebratu, 1998) and the birth gave the call for sustainable environment or environmental conservation. Or else, the world will run into *Environmental Resource Deficit*- a situation whereby environmental resources become debilitated and lack the capacity to provide support for sustainable development- in nearest future (see Macionis, 2005). Now the question that comes to mind is; what shall it profit a nation who lavishly utilized environmental resources for the sake of development and yet, the resources to sustain the development is no longer available for use? The ready answer you get is; there is ultimately no gain. This fact was reiterated by Akanle (2014) who emphasize that *while development is important and must be achieved, experiences of many developed Euro-American countries, and recently China, have shown that development must be sustainable*. With this in mind, it is pertinent for developing nations to rethink and react actively towards a caring environment in the pursuit for desirable socio-economic development. The care must however cover all the types of environmental resources available in the interest of sustainability.

Environmental resources are tangible and non-tangible in nature. They equally differ in quantity and quality across regions, societies and nations. Some of these resources have intrinsic value of their own with long-term utilization while others does not. Consequently, Awan (2013) identified four common types of environmental resources which are:

i.   **Renewable Environmental Resources**: These are resources that are capable of natural regeneration into useful products within specific period of time. As such, these kind of environmental resources are always available for consumption as long as their capacity to regenerate is not interrupted by human activities or natural disasters. E.g. soil, clean air and water.

ii. **Non-Renewable Environmental Resources**: These are natural resources that lack the capacity to regenerate or the rate of renewable is slow thus they are relatively scarce for consumption or fixed in quantities. E.g. ground water, minerals etc.

iii. **Continuous Environmental Resources**: These are resources that are constant and available with the immunity of solar energy. They cannot be affected with gross mismanagement but they could be affected by atmospheric pollution. E.g. wind, gravity, tidal energy and solar energy

iv. **Extrinsic Environmental Resources**: These are resources which can breakdown or deflate in quality and quantity if they are not effectively managed. E.g. human skill, institutions' management abilities.

From the foregoing, it is obvious that irrespective of the type or category of environmental resources, it is clear that sustainable development can only be achieved by total care for all resources for maximum output, which affect quality of life subsequently. In effect, any form of use or misuse (including pollution) must be reduced, controlled, managed or completely eradicated in the society.

METHODOLOGY

Research Design: The descriptive survey design was used in this study. It involved the use of a self-designed questionnaire and interview guide in collecting data from the respondents. This method was chosen in order to make reference to phenomena as they exist in real life and to fully capture the situation under study.

**Brief Profile of Lagos State**

Lagos State is the commercial and industrial nerve of Nigeria; it is equally the home of the highest number of industries and commercial establishments in Nigeria. Though it is the smallest state in Nigeria with an area of 356,861 hectares of which 75,755 hectares are wetland, yet it has the highest population (estimated at 17.5 million) which is over five per cent of the national estimate. Lagos state consists of twenty (20) Local Government Councils and thirty-seven (37) Local Government Development Areas.

Table 1: Twenty Local Government Councils and their population

Local Government Councils	Male	Female	Total
Agege	564,239	468,825	1,033,084
Ajeromi-Ifelodun	723,644	711,651	1,435,295
Alimosho	1,099656	947,370	2,047,026
Amuwo-Odofin	301,012	223,959	524,971
Apapa	**264,728**	**257,656**	**522,384**
Badagry	187,427	192,993	380,420
Epe	153,360	170,274	323,634
Eti-Osa	**460,124**	**532,391**	**983,815**
Ibeju-Lekki	49,613	49,927	99,540
Ifako-Ijaiye	380,112	364,211	744,323
Ikeja	**328,778**	**319,942**	**648,720**
Ikorodu	364,207	324,838	689,045
Kosofe	527,539	407,075	934,614
Lagos Island	461,830	398,019	859,849
Lagos Mainland	326,433	303,036	629,469
Mushin	684,176	637,341	1,321,817
Ojo	507,693	433,830	941,523
Oshodi-Isolo	**514,857**	**619,691**	**1,134,548**
Somolu	**517,210**	**507,913**	**1,025,123**
Surulere	698,403	575,959	1,274,362
Grand Total	9,115,041	8,437,901	17,552,940

Source: Lagos State Bureau of Statistics, 2005

Fig 1: Map of Lagos State
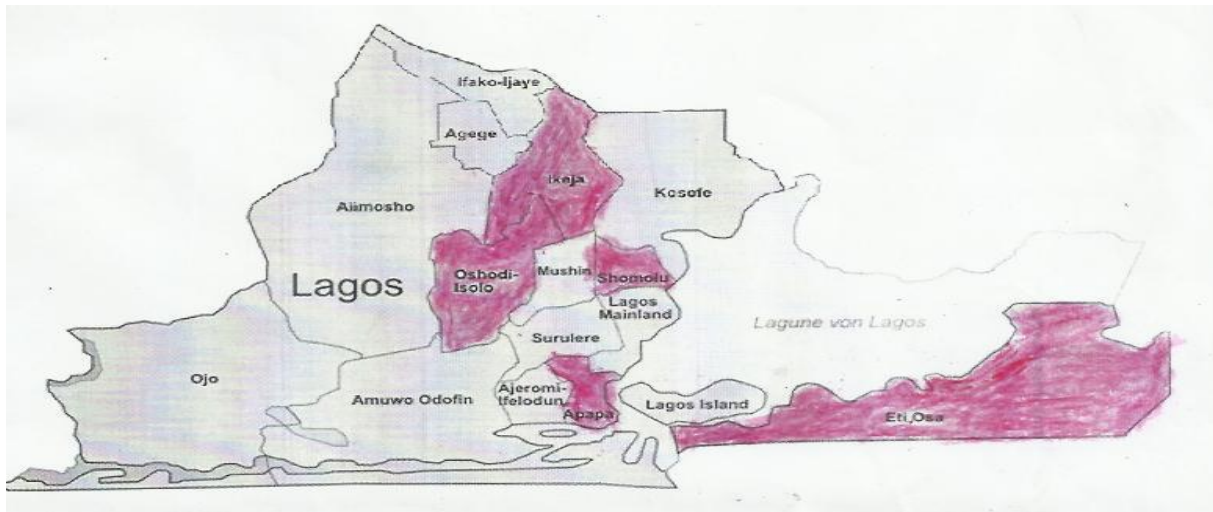
Subject: Subjects for the study were the residents of polluted communities in Lagos metropolis, staff of Lagos State Waste Management Agency (LAWMA) and Lagos State environmental regulation officials within the selected Local Government Councils. *Household survey* method was used to select respondents for the study. The *household survey* method started with careful discussions with key informants who have stayed in Lagos state for more than five years as well as those who are

knowledgeable about the subject matter and are willing to share their knowledge in the course of the research. They assisted in guided tour to polluted areas and their Local Government Councils in Lagos metropolis. The following LG councils (Apapa, Oshodi/Isolo, Eti-Osa, Somolu /Yaba LGDA, and Ikeja) were listed by the key informant as areas experiencing pollution at the time of the study.

Afterward, cluster sampling method was used to select cluster communities experiencing environmental pollution due to industrial and commercial activities in the LGAs. For instance, Computer village, Alade and Oregun communities were selected in Ikeja Local Government. Also, Gaskiya, Owoseni, Badia and Abete communities were selected in Apapa Local Government. For Eti-Osa Local Government, Ikate/Lekki, Maroko/Okun Aifa, Igbo-Efon/Maiyegun and Addo-Okeira communities were selected. And, in Somolu/Yaba LGDA communities like Adekunle, Aiyetoro, Makoko, Alagomeji and Bariga were selected. While, communities like Mafoluku, Igbehinadun, Shogunle, Baruwa and Apena were selected in Oshodi/Isolo Local Government. Thereafter, balloting sampling method was employed to select five streets in the selected polluted communities. Subsequently, household survey in which the total number of houses on the selected streets were determined and the sample size distribution for each Local Government Areas were used to pick households through systematic sampling method at regular interval from which people who are 18years and above and knowledgeable enough to understand the subject matter were selected to fill the questionnaires thereafter; purposive sampling was used to pick respondents for in-depth interview section. In essence, multi-stage method was used to select 340 respondents for gathering quantitative data and 15 interviewees for qualitative data.

Research Instrument: The instruments used in this study are questionnaire and interview guide that was designed by the researchers.

Procedure: The subjects were given the questionnaire to fill as well as in-depth interviews were conducted in their respective neighborhood.

DATA PRESENTATION AND MAJOR FINDINGS
Socio-economic and Demographic Characteristics
Results of socio-economic and demographic characteristics of the respondents as presented on the table 2 showed 177 participants representing 54.3% of male participants; while 149 participants represent 45.7% of female participants. A majority of the respondents 23.6% age bracket fell between 28 – 32 years of age, while the least 5.2% fell within 53years and above. Meaning that bulk of the residents in polluted areas of Lagos metropolis are economically active population who are more mobile than the elderly. The marital status of respondents showed that 40.2% were single, 40.8% were married and 3.7% divorced. This shows that most of the people that participated in the study were married male with family responsibilities and many were also single. Furthermore, the educational status of the respondents showed that most respondents were very literate having one form of educational qualification or the other (97.9%), while only 2.1% had no formal education. The literacy level of the respondents notwithstanding, the degree of pollution is very high. One would have

thought that education would have impacted positively on the environment to warrant a care attitude for the environment for the benefit of the living beings in the areas.

Table 2: Demographics and employment distribution of respondents

Sex	Frequency	Percentage
Male	177	53.3
Female	149	45.7
Total	326	100.0
Age range	**Frequency**	**Percentage**
18-22	16	4.9
23-27	43	13.2
28-32	77	23.6
33-37	69	21.2
38-42	30	9.2
43-47	38	11.7
48-52	36	11.0
53 and above	17	5.2
Total	326	100.0
Marital status	**Frequency**	**Percentage**
Single	131	40.2
Married	143	40.8
Separated	12	9.2
Divorced	30	3.7
Widower	20	6.1
Total	326	100.0
Education	**Frequency**	**Percentage**
No education	7	2.1
Primary education	34	10.5
Secondary education	50	15.3
OND/NCE	66	21.2
Graduate qualification	129	39.6
Post graduate	37	11.3
Total	326	100.0
Occupation	**Frequency**	**Percentage**
Civil servant	92	28.2
Private/factory workers	67	20.6
Traders/ business owners	79	24.2
Apprentice	62	19.0
Student	16	4.9
No work at all	10	3.1
Total	326	100.0
Income	**Frequency**	**Percentage**
No income	10	3.1
Less than # 20, 000	37	11.3
#20, 001 -# 40, 000	44	13.5
# 40, 001 -# 60, 000	90	27.6
#60, 001- #80, 000	53	16.3
#80, 001- #100,000	37	11.3
#100,001 and above	55	16.9
Total	326	100

Source: Field Survey, 2013

Furthermore, the distribution of occupational status showed that 28.2% were civil servant, 20.6% were private/factory workers, 24.2% were traders/personal business owners, 19.0% were apprentice, 4.9% were students and 3.1% were unemployed. In effect, a majority (92.0%) of respondents are employed and they probably work within the polluted environs. Also, the income distribution of respondents showed that most of them (27.6%) were earning NGN 40,000-NGN60,000 per month, while only 16.9% were earning NGN100,000 and above and 3.1% had no source of income. It could be inferred from the income distribution above that a majority of the respondents were people of limited means of income while some had no source of income at all.

Nature of Environmental Pollution in Lagos Metropolis

Table 3: Nature of Environmental Pollution in Lagos Metropolis

Do you experience environmental pollution in your neighborhood	Frequency	Percentage
Yes	304	93.3
No	22	6.7
Total	326	100.0
What are the forms of environmental pollution in your neighborhood	**Frequency**	**Percentage**
Noise	96	31.5
Dust	08	2.6
Industrial Smoke/Emission	27	8.9
Gaseous-chemical	11	3.6
Bad odour from open dump site, blocked drainages and canals	68	22.4
Water contamination	94	31.0
Total	304	100.0
Which of the kind of pollution stated above do you find most devastating	**Frequency**	**Percentage**
Noise	81	26.6
Dust	07	2.3
Smoke/emission	26	8.6
Gaseous-chemical	13	4.3
Bad odour from dumpsites	74	24.3
Water contamination	103	33.9
Total	304	100.0

Source: Field Survey, 2013

Result on table 3 revealed that 93.3% of the respondents claimed that they experience pollution in their neighborhood while only 6.7% disputed this. Thus, a majority of the respondents acknowledge the occurrence of pollution in their neighborhood. The finding upholds Magbegbeola (2001), Adewole (2009) and Guti, Aji, and Magaji, (2012) who submitted that there is environmental pollution in some part of Lagos metropolis due to rising rate of urbanization, industrial and commercial activities. To corroborate this, Adelakun (2003) and Adesiyan (2005) noted that poor sanitation exercise, lack of proper planning for buildings and nonchalant attitude amounted to the occurring environmental pollution in Lagos State, Nigeria.

Investigating the forms of environmental pollution in their neighborhood, 31.5%, of the respondents said noise pollution 2.6 % said dust incident, 8.9% said industrial smoke/emission, 3.6% said gaseous-chemical probably from industries around them and 22.4% said bad odour from open dump site, blocked drainages and canals near their houses and industrial premises,

while 31.0% said water contamination which must have been a result of environmental pollution. Therefore, it can strongly be deduced that noise, water contamination, bad odour from dumpsites and smoke are the forms of pollution in study locations as adduced and confirmed by the respondents.

Furthermore, the inference on table 4.3 showed that a majority (33.9%) of the respondents rated water contamination as the most devastating form of pollution in their vicinity, followed by noise (26.6%) and bad odour from dumpsites (24.3%). The finding corroborates Akanni (2010), Adewole (2009) and Awosika et., al (2010) who reported that the incidence of water contamination is overwhelming in many cities in Nigeria particularly in Lagos State due to indiscriminate discharge of industrial, commercial and domestic effluent on public land, or in drains, river and lagoon. Perhaps an attempt uncovering underlying social realities and process surrounding the entire process of environmental pollution in Lagos compelled the need for qualitative study to strengthen the outcome of this study. Below are the various views expressed by the respondents on the issue of pollution, its effects and how the residents have been coping prior to this study. An informant from the government agency in charge of waste management in Lagos was interviewed he agreed that

> *Yes, there is pollution in some communities in Lagos metropolis. For instance, areas like Makoko, Addo-Okeira and Ikate in Eti-Osa LGA experience air, noise, and water pollution due to indiscriminate waste disposal and effluent from breweries, food processing industries, chemical industries and sawmills established in those areas. While, other areas like Ikeja, Ojota, Oshodi and Ikorodu experience ambient air pollution and noise due to the activities of large number of motorists, manufacturing industries, and open dumpsite in the area. However, the agency and government is working hard to redress the situation [...] (KII/LAWMA/Eti-Osa/2013)*

Investigating the issue further, an in-depth interviewee during IDIs session held with some occupants in the study area stated that:

> *Pollution such as noise arises from the use of generator, grinding and printing machines from nearby industries constitutes the form of environmental pollution we experienced in this neighbourhood (IDI/Residents/Oshodi/2013/05/26).*

Also confirming the forms of environmental pollution in Lagos metropolis, a female respondent in Ikeja, said:

> *Here, we experience much of noise and air pollution. The air pollution occurs from the dumpsite at Olususun in Ojota which is about 5km away from here. Most especially during raining season the odour gets more shocking with serious implication on people wellbeing because that is when most of our children fall sick and many adults do feel uncomfortable to stay in this location... other forms of pollution is noise from motorists, motorcyclists and use of power generators.. As a result of noise pollution we can't sleep or rest during the day [...] which has caused so many health challenges to people living in this area (IDI/Female/Residents/Ikeja/2013/05/27).*

Probing this further, a respondent in Oshodi/Isolo revealed the nexus between different forms of environmental pollution when he said:

> *This area used to have many environmental issues such as noise, congestion and air pollution which arise from habitual dumping of industrial and domestic wastes in canals, drainage, and street corners by some industries within the community... but, the transformation pace of former Governor of Lagos State, Babatunde Fashola has reduced*

the level of environmental pollution to a bearable limit. However, water pollution is what we are facing now. There is no good water in this vicinity at all even the pipe borne water in this area is not save for drinking or cooking because we use to see particles in the water whenever we fetch it…….This I believe contribute to the occurrence of water borne disease among residents of this community (IDI/Male/Residents/Oshodi/Isolo/2013/05/26).

Also, during the interview sessions in Eti-Osa one of the respondents said:

Water pollution and habitual dumping of wastes into the Lagoon are the most common form of environmental pollution in this part of Lagos metropolis. Most of the people living here throw their wastes into lagoon which had cause high death of aquatic species and economic loss to people especially those whose livelihood is attached to aqua business (IDI/residents/Eti-Osa/2013/05/27).

In corroborating the above statement, a key informant interview revealed that:

About 69 percent of fluids and chemical wastes produced by industries in Oshodi, Somolu, Eti-Osa and Ikeja areas are disposed in public drains and canal without adequate treatment. This contaminates the ground water table and other water sources like borehole and well which most of the residents in these areas depend on for survival. Equally, there is occurrence of air pollution in these areas most prominent is Ikeja and Oshodi areas where most people live and work close to dumpsite (KII/Male/Resident/Ojota/2013/05/28).

From the responses above, one can deduce that a significant relationship exist between the way of life of the respondents, waste production, disposal and environmental pollution in Lagos metropolis, Nigeria. This confirms the assumption of Pollution Control Theory (PCT) which states that, it is impossible to have industrial/domestic activities that involves no wastes (Helfand, Senthiselvan, Zhang, Dosman, Barber, et., al 2003). Also, it was found that poor environmental regulation, planning and waste management system encouraged people to dump waste in ethical or save manner. In addition, the issue of unstable power supply forced many businesses and households to generate their electricity with the use of generator contribute to the rising level of noise pollution in Lagos metropolis, Nigeria.

In addition, the finding revealed that water contamination, noise, land and air pollution are common forms of environmental pollution in Lagos metropolis (Adewole 2009; Ologe et., al 2005; Ayoola et., al 2012). While a majority of the respondents claimed that water contamination is the most prevalent and devastating form of pollution which has huge implications on human and societal development (Adebowale et, al, 2011; Akanni 2010; Adewole 2009). This is so, since polluted water is not just merely unsafe for drink, it also affects items of uncooked food that are prepared with water. More so, water pollution caused by chemicals is a serious problem because it results in death of aquatic life, cholera attack, skin infection, death and loss of livelihood. More worrisome is the fact that water pollution is very difficult to correct since water spread very fast across water channels and geographical boundaries thus; strict control and monitoring team should be put in place to protect the rivers and lagoons from further contamination. In addition, the finding has shown that the kind of environmental pollution in Lagos metropolis is quite similar to that of China, Korea, Japan, South Africa and many other developing countries who are experiencing rapid industrialization-cum development with increasing environmental pollution challenges.

Process of Wastes Discharge in Lagos Metropolis

Table 4: Process of wastes Discharge in Lagos Metropolis

How are the solid-metal wastes discharge in your neighbourhood	Frequency	Percentage
Fallow land and dump site	81	24.8
Municipal waste container or sewer	35	10.7
On the road, bus-stops, under the bridge	46	14.1
Canals/large drainage	52	15.9
Lagoon, river or ocean	69	21.2
Fallow land and dump site, Municipal septic tank or sewer and Lagoon	43	13.2
Total	326	100.0
How are smoke and gaseous-chemical wastes discharge in your neighbourhood	**Frequency**	**Percentage**
Direct to air	97	29.8
Underground or open pipe	41	12.6
Municipal septic tank or sewer	23	7.1
Public drainage	38	11.7
Direct to air and underground or open pipe	48	14.7
Drainage and municipal septic tank or sewer,	53	16.1
All of the above	26	8.0
Total	326	100.0
How is industrial used water discarded in your neighbourhood	**Frequency**	**Percentage**
Municipal septic tank or sewer	30	9.2
Underground or open pipe	103	31.6
Fallow land and dump site	73	22.4
Public drainage	77	23.6
Lagoon, river, or ocean	43	13.2
Total	326	100.0

Source: Field Survey, 2013

As a follow up to the views above, respondents were asked to indicate how solid wastes are discharge in their neighbourhood. The result showed that 58.9% of the respondents said on fallow land and dumpsite, 23.9% said through municipal septic tank and sewer, while 21.1% said in public drains, canals and lagoon. Thus, majority of the respondents claimed that solid wastes are discharged on fallow land and dumpsites around them. The finding corroborates Adesiyan (2005) who observed that incineration, sanitary land filling and composting are the commonly used method of disposing solid wastes collected from homes and industries in Nigeria. This is very significant in the scenery pictures that were taken in the study location which would be discus later in this section.

Furthermore, respondents were asked to indicate how industrial emissions and gaseous-chemical wastes are discharged in their neighbourhood. The result showed 47.0% of the respondents said through open pipes into the air, 36.9% said through public drains and underground pipe while 16.1% said through municipal septic tank and sewer. Thus, it can be inferred that majority of the respondents claimed that industrial emissions and gaseous-chemical are released directly into the air through the use of open pipes. This act alters air quality and climatic conditions with concomitant health and social implication on living beings especially those within the atmosphere of its occurrence. The finding support World Health Organization

(2002) who submitted that air quality in many cities in developing countries is remarkably poor as well the residents are largely exposed to ambient concentrations of air pollution well above the World Health Organization guidelines. The implication of large exposure to air pollution include the occurrence of airborne diseases, acid precipitation, depletion of ozone layer and death (Tawari and Abowei 2012; Richa et., al 2011).

More so, respondents were asked to show how industrial used water is discarded in their neighbourhood. The result revealed that 37.4% said through public drains and canals, 31.6% said through underground pipe, and 22.4% said through stream, river and lagoon while 8.6% said on municipal septic tank or sewer. The deduction that may be drawn from the above finding is that most of industrial used water is discarded in public drains, canals, river, stream and lagoon. The finding upholds Adebowale *et., al,* (2011) and Adewole (2009) who reported that industrial effluents containing chemicals and metals are often discharged in public drains and lagoon which have direct effect on the ecosystem. In the same vein, Adewolu et., al (2009) observed that untreated industrial used water is the cause of damaged ground water table as well as fish kills in Lagos lagoon.

To further investigate the foregoing discourse on how industrial wastes are discharge in Lagos metropolis, an official of Lagos State Waste Management Agency revealed that:

> *Industrial wastes can be discharged into the environment through several channels depending on the nature and quantity of the waste as well as the location of the waste generators because it was found that some organizations gather wastes in their compounds and around their premises then later burn it (incineration) or they use the wastes to fill valleys (sanitary land filling) and sometime the refuse are buried underground (composting)… A part from this, solid wastes like food wastes, clothes, metals, papers and containers are sometimes discarded on fallow land, roadsides arena, under bridge, public drainages and sewer designed to carry only municipal wastes…. Also, unwanted gas, chemical and emission are released through open pipe into the atmosphere while industrial used water is discharged through public drainages and underground pipe directed to nearer river or lagoon…. In addition, unhealthy production of noise through the use of generator as a means of power supply, uncontrolled blasting of horns by motorists, and loud speaker for communication in venue of occasions, club houses, places of worship etc constitutes the channels by which industries and religious organizations discharge pollutants in Lagos metropolis (KII/Male/Ojota/2013/05/23)*

Similarly, a female and a graduate of Biochemistry said:

> *Some industries in this area which I wouldn't like to mention names discharge their wastes into water surface, stream, river or lagoon more often than not without any form of remediation or treatment. This has several deleterious consequences on lives and the environment for instance, polluted water is bad for human consumption, irrigation and production of food chain and quantity of aquatic flora and fauna. (KII/Male/Eti-Osa/2013/05/23)*

This can also be buttressed with the scenery pictures taken at some spot within the study environment presented below.

Fig 1: showing wastes discharged on road side in Apapa, Lagos Metropolis

Wastes dumped on roadside arena, beside and around residential houses could be a potential source of land and air pollution which can endanger the wellbeing of the people living in that location.

Fig 2: Showing an open dump behind a house in Eti-Osa, Lagos Metropolis.

Stagnant water that contains refuse within residential houses can lead to soil pollution, damage of underground water table and water contamination with concomitant effects on public health and livelihoods.

Fig 3: Showing garbage dumped in a channel in Yaba, Lagos metropolis.

Dumping of garbage or refuse in open drain causing drain blockage which could obstruct free flow of water in the drain and by extension result in incidence of flood during raining season with concurrent ecological, health and social risks.

Fig 4: showing underground pipe run into the Lagoon in Lagos Metropolis

This act could contaminate the water quality in the lagoon and other water sources nearby. It can also lead to production of substratum for bacterial growth, diversity of organisms, reduction in oxygen level and eutrophication with concomitant effect on aqua species.

Fig 5: showing containers used for discharging industrial effluent at the Lagoon front

This shows the extent to which chemical wastes are discharged into the lagoon. Excessive discharge of chemical waste into water bodies can cause increase in microbial load and susceptibility of aquatic species to diseases that may warn their survival and development (Adesiyan 2006 and Adewole 2009).

Fig 6: Showing industrial sewage discharge into waterway in Ikeja, Lagos Metropolis

This possibly will cause soil pollution, contamination of water source and ground water table, which lead to water borne diseases.

Public Perception and Coping Strategies of Environmental Pollution in Lagos Metropolis

Coping strategies in this context mean the reaction towards a change in environmental quality. Blaikie, Cannon, Davis and Wisner (1994) stated that the degree of coping strategies involves a combination of factors like experiences, education, available resources and/or state of health. In the same way, theory of pollution control assume that the risk of a social unit (household, city, state) is exposed to is determined by the quality of environmental impact and the current condition of the social unit (Ostrom, Dietz and Stern 2002). Therefore, to identify reasons for environmental control in Lagos metropolis; it is important to understand how households cope with their specific environmental situations.

Based on this, table 5 revealed the respondents coping strategies for environmental pollution in Lagos State and particular in the study area. Result showed that 20.7% of the respondents use prevention gadgets, 15.1% engage in periodic body exercise

and medical check-up, 15.4% conduct regular fumigation and cleaning of their environment, and 16.5% avoid going to some areas within the neighborhood, 15.8% used air fragrance and deodorant, while 16.5% combined two or more of the identified coping strategies. From the responses on the table, one can deduce that a majority of the respondents claimed that they use preventive gadgets in coping with the pollution in their neighborhood. This however did not limit the use of other mechanisms as a combination of all methods seems useful to all the respondents. This is an indication for a fight to survive against all odds brought about the polluted environment.

Table 5: Coping Strategies of Environmental Pollution in the Study Area

What strategies do you employed in coping with the pollution in this area	Frequency	Percentage
Use of prevention gadgets	63	20.7
Periodic medical check-up and exercise	46	15.1
Constant fumigation and cleaning of my environment	47	15.4
Avoid going to some area within the environment	50	16.5
Use of air fresher, fragrance and deodorant	48	15.8
Use of pollution prevention gadgets, use of pollutant fumigation, avoid going to some area within the environment	50	16.5
Total	304	100.0

Source: Field Survey, 2013

Also, confirming the coping strategies employed by residents in the study area, a male respondent said:

> *Here, we use air freshener to curb the bad odour coming from the dump site and pollutant industries around us. While some that cannot afford to buy air freshener develop psychological response to control the pollution.(IDI/Male/Resident/Ikeja/2013/05/27).*

Similarly, a female respondent from Eti-Osa said:

> *I boiled the water in the evening and leave it to settle over night then use it for drinking and cooking. Because I cannot afford to buy water treatment which some of my neighbour use in treating the water before they use it. (IDI/Female/Resident/Eti-Osa/2013/05/28)*

Another, a female respondent from Oshodi/Isolo said:

> *I use alum to settle the particles in the water then transfer the clean water to another bucket before using it. And, in a situation that I can't wait for the water to settle; I sieve it and use like that. (IDI/Female/Resident/Oshodi/Isolo/2013/05/28)*

In addition, a male respondent from Somolu/Yaba said:

> *I get on weekly breathing exercises and medical check up to reduce the effect of pollution*
>
> *in my neighbourhood. (IDI/Male/Resident/Somolu/Yaba 2013/05/26)*

From the responses above, it is evident that some of the respondents have developed coping strategies in dealing with the environmental pollution in their neighborhood. The coping strategies as revealed by respondents in this study include; the use of preventive gadgets, air freshener, periodic medical check-up and exercise, treatment of polluted water before use, constant fumigation and cleaning of the environment.

SUMMARY AND CONCLUSION

This research work established that there is strong connection between the peoples way of life, wastes production, disposal and pollution in Lagos metropolis. Much of wastes generated from industrial and domestic activities are indecently disposed into the environment which affects the quality of environmental resources (i.e. air, water and land) hence resulting to environmental pollution or neighbourhood cost. Environmental Pollution is thus detrimental to realization of sustainable development in any given society. Equally, the negative impact of environmental pollution spread beyond its area of occurrence and it is socially, physically or economically draining for human development and national growth.

What is evident from the response of the participants is that the people collectively generate the waste in their community be it domestic or industrial. However they could not collectively proffer any solution due to the individualistic feature of urban life hence they resolve to cope individually using all manner of strategies that did not address the generation of waste in the communities. The generation of waste, the reckless disposal by the people and non evacuation of it regularly by the government agencies create a situation of lack of care of the environment and this attitude is a fundamental threat for the sustainability of the same environment for the future generation.

Regrettably, the primary stakeholders seem not to be worried sufficiently to warrant a coordinated approach to reverse the pollution though they are sufficiently aware of the various implications especially the health hazard that the pollution poses to them.

Finally, the existence of at least two government agencies i.e. Lagos State Waste Management Agencies (LAWMA) and Lagos State Environmental Protection Agency (LASEPA) is encouraging and a pointer to organized efforts to eradicate pollution in Lagos Metropolis. More concerted efforts are however needed by all major stakeholders to address the attitude of the people about waste generation, its disposal, location of disposal, evacuation and general management and control. All these efforts must however be geared towards the comfort of the people now and how the same environment can be sustained for the future people to occupy the same environment without compromising the quality and quantity.

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