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Environmental Health Issues and Challenges in Lagos State, Nigeria

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Abstract. This study is a critical examination of Environmental Health Challenges and Causes in Lagos State Nigeria in historical perspective. The paper also analysed some of the cogent challenges and causes of Environmental Health issues in Lagos State such as urbanisation, air pollution, noise pollution, landfill issues and ground water pollution. Historical research methodology was adopted. The primary data for the study was collected through direct oral interviews of 45 residents of the state through random sampling technique. It also involved the use of secondary data e.g. textbooks, newspapers, journals etc. The study contributed to knowledge by filling the gap of Lagos State Nigeria in historical perspective. This work concluded that Environmental Health in Lagos State is paramount in order to safeguard the people and the environment. And to ensure environmental sustainability in Lagos State, it is therefore crucial for residents and government agencies to wake up to their responsibilities.

Keywords: Environmental Challenges and Causes, Environmental Health, Environmental Pollution.

1. Introduction

The global presence and obvious effects of environmental degradation are undeniable and the condition of the environment has significantly worsened. There are notable increase in climate change and the greenhouse effect, leading to a countless of natural disasters like floods, noise pollution, air pollution, and the emergence of both infectious and non-communicable diseases, all posing threats to human health. Many of the generally acknowledged global environmental problems (greenhouse warming, ozone depletion, soil erosion, chemical management, acidic rain and water pollution, among others) are directly or indirectly caused by the creation, operation, or disposal of the built environment undertaken by man. It was believed that many of the environmental challenges were caused by human activities which called for social action on environmental sustainability. Ogunba (2016) observed that Lagos emerged as Nigeria's primate city, its primacy status emanated from its dominance in commerce and huge contributions to the national economy, and its sheer population size. Its primacy originated when Nigeria's colonial administrators made Lagos one of their preferred settlements in Nigeria during their occupation (from 1861 until 1960), a position that was maintained till 1991. During that period, major governmental departments, financial markets, regulators, and multinational corporations were located in Lagos. These include the Central Bank, the Nigerian Stock Exchange, Securities and Exchange Commission, nearly all commercial and merchant bank headquarters, corporate Registrars of blue-chip companies, and multinational corporations especially the petroleum exploration companies which are at the core of the country's economy.

This paper explored various environmental issues and challenges encountered Lagos State Nigeria, with a specific focus on urbanisation, air pollution, noise pollution, landfill issues and ground water pollution. Environmental degradation in Lagos State was rapidly worsened due to human activities, resulted in a surge of negative environmental health issues. Lagos State is a mega city situated in an emerging national economy and the largest city in Africa (Abila and Kantola, 2013). And coupled with its high revenue generation of N 418.99 billion in

2020 accounted for 32.1 percent of the total revenue generated by 36 states and federal capital territory (Abdullahi et al., 2020).

2. Literature Review

World Health Organization (2012), opined that Environmental Health addresses all the physical, chemical, and biological factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. Environmental health is the study of those factors in the environment that affect human health. The factors could be pollutants or toxicants in air, water, soil, or food, transferred to humans by inhalation, ingestion, or absorption and result in adverse health effects (Ebong, 2002). Environmental Health comprises sustaining a natural environment free from undue hazard which provides essential environmental services to households and communities. These include: Sanitation, Water supply, Traffic control, Hygiene promotion, Air pollution control, Storm water drainage and Solid waste management (Aribisala, Omotoso and Folorunso, 2004). Thus, the definitions above highlighted that environmental health fundamentally focused on preventing disease and creating healthy supportive environments.

Faniran and Adeboyejo, (1999), observed that Environmental Health is broader than hygiene and sanitation; it encompasses hygiene, sanitation and many other aspects of the environment such as global warming, climate change, radiation, gene technology, flooding and natural disasters. It also involved studying the environmental factors that affect health. Environmental health is the art and science of protecting against environmental factors that may adversely impact human health or the ecological balances essential to long-term human health and environmental quality. Such factors include, air, food and water contaminants, radiation, toxic chemicals, wastes, disease vectors, safety hazards and habitat alterations (Agberemi, 2003). Owoade et al, (2013), defined environmental health as the use of different means to protect public health through regular removal of wastes, maintenance of clean surroundings, good food and appropriate personal hygiene. It also involved regular supply of safe water, prevention of pollutions, and provision of decent housing with appropriate facilities essential for human conveniences.

3. Methodology

Historical research methodology was adopted. Historical research methodology is concerned with analysing and interpreting the meaning of historical events. It is a process by which a researcher is able to reach a conclusion as to the probable truth of an event in the past studying facts available for observation in the present (Berg and Lune, 2012). This study relied on primary historical data (direct accounts of events, archival data, official documents, personal records and records of eyewitnesses). It also involved the use of secondary historical data (information from persons who do not witness the event e.g. textbooks, newspapers, journals etc.) The primary data for the study was collected through direct oral interviews of 45 residents through random sampling technique.

4. Theoretical Framework

4.1 Humans-Environment Interaction Model

The model portrayed a system of dependency of humans on its environment and the impact of its attitude and activities on the same environment. From the Model, humans can either choose to protect or destroy their own environment through their actions. The result of their action is either total destruction or sustainability of the environment. Deaton (2004) stated that the disposal of solid waste and hazardous waste in or on land without careful planning and management can present a danger to human health and the environment. The unrestricted dumping of domestic, industrial, hospital and agricultural waste at the city's main dumping site was cause for concern. For example, if a dumpsite occupies about 30 acres, with at least 500 tonnes of waste deposited daily, the indiscriminate dumping of refuse and open dumping of refuse contaminate drinking water from both underground and surface supplies. It also pollutes air and land, above all it provides easy arena for disease spread.

Furthermore, many environment-related diseases developed from filthy environments, which were human creation. Some people lived and carried out their businesses in these environments without concern for their health. When the waste is burnt, poisonous gases are formed and which is very poisonous. Many residents in Lagos State were suffering from respiratory abnormalities and many had blocked airways. Cases of skin disorders, abdominal problems and eye infections were also common among the people of Lagos State. Malaria was another threat, since blocked drains collected water and eventually became breeding grounds for mosquitoes.

In Nigeria, evidence abounds, where ordinary citizens have arbitrarily dumped their solid waste refuse into gutters or open drains (even when hoppers or waste bins are provided).For example, in a study carried out in Lagos in 2005 to assess the success of Lagos Environmental Sanitation Authority and Malaria Control Project in communities like; Surulere, Ajeromi and Mushin Local Government Areas, about seventy percent of the sampled 1403 respondents confirmed that they often dumped their refuse inside the gutters(Aderemi and Otitoloju,

2012).This model explained the necessary interaction between human and environment. It enabled us to properly understand the relationship between man, his environment, and health issues.

5. Issues and Challenges

5.1 Urbanisation of Lagos from 1800

Mabogunje (2000), observed that urbanisation trends increased after the end of the Second World War, when the volume of people that migrated into cities surged greatly with a large proportion concentrated in big cities. The migration to Lagos has been steadily escalated over the years. Spectacular urban growth in Lagos dated to the early 1800s, when its favorable location on the West African coastline made it attractive to the European settlers. From being a small slave port in 1800 and grew to become the most important port on the West African coastline (Olukoju, 2003). In particular, the southern shores of Lagos Island were conducive to the early European traders on account of the frontage which was suitable for construction of piers and wharves that received ships (Alagbe, 2006). That area became and remained one of the central business districts in Lagos. Its strategic location has interminably attracted people and this resulted in a large and steadily rising population which posted serious threat to environmental health. Urbanisation is inevitable in development process. As John Clos, argued "the only way to avoid urbanisation is to avoid development (Ogunba, 2016). Aworemi, Adegoke and Opoola (2011), suggested that the drift to Lagos was motivated by hope of employment, access to education, improved health care, better social amenities and the presence of recreational facilities in Lagos. All these reasons support the migration theories about the pull of urban areas and explain the attractiveness of this small Island to the migrants.

Ogunba (2016), opined that as a coastal state with sea ports, Lagos has been a natural gateway for international trade and engaged in international commercial transactions and carriage of goods by sea that has generated huge revenues for the country. The larger proportion of Nigeria's trade is routed through the sea, and its economy accounted for seventy percent of the maritime trade in the West African sub-region. Lagos contributed forty percent of the country's non-oil National Gross Domestic Product, and is thus a major contributor to national wealth. However, Harris (2000) cautioned that population growth that is unaccompanied by adequate social arrangements causes glaring and troubling human problems of the deepest intensity. Population is indeed a problem for sustainability where the proper infrastructure and institutional frameworks which would otherwise have contributed to sustainability are lacking. The carrying capacity of any city experiencing rapid population growth will eventually be overextended. He also warned that in consequence, water supply shortages, lack of wastewater treatment, pollution, diseases, congestion, waste problems and deteriorating housing will all be manifestations of environmental stress.

5.2 Air Pollution

In Lagos, due to population density coupled with intense industrial and commercial activity, the air pollution of Lagos city was of particular interest (Odekanle et al., 2016). Previous studies undertaken in Lagos have reported the significant impact of pollutants on the local air quality when compared with WHO standards (Efe, 2018). There were several sources of air pollutant in Lagos mega city. One of such sources is road transportation. The extent of the significance of road transport as a source of specific pollutants at any point in time depends on the level of traffic and proximity of other sources of specific pollutants as well as meteorological parameters (Odekanle et al., 2016). A study conducted by the Lagos Metropolitan Area Transport Authority (LAMATA, 2008) on air quality revealed that vehicular activities contributed about 43 percent to the deteriorated air quality in Lagos.

In Nigeria, there has been a growing importation of used vehicles which aided the degradation of the environment despite the global attempt to reduce environmental problems caused by transport machinery (Jayesimi, Oral interview, 2023). Ojolo et al. (2007) studied the effects of vehicle emissions on human health in Nigeria using four locations in Lagos State. The study also observed the physical effects on vegetation, buildings and structures and concluded that the type of fuel, presence of industries and concentration of traffic determined the impacts of emissions on the ecosystem. Orisaleye et al, (2018), studied the environmental impacts of urban road transportation in south-western states of Nigeria by conducting interviews, estimating the air quality indicators and performing analyses on blood samples. The study revealed that responders suffered from air pollution related diseases such as headaches, loss of vision, anaemia, forgetfulness and fatigue. Most of the people interviewed said air pollution is one of Lagos identities. On air pollution in Lagos model and simulated approaches have attributed the bulk of noxious emissions to heavy vehicular traffic and widespread usage of generators for electricity to power machinery and other electrical equipment. (Izoma et al, Oral Interview, 2023). Another major source of air pollutant emission in Lagos is solid waste combustion. In Lagos, it was a common

practice to burn solid waste. While solid waste combustion is advantageous in terms of large volume of waste treatment, it thus led to emission of compounds that are of environmental concern. One of the major problems in Lagos State was the increase in quantity of waste generated. Of equal concern is the poor and inefficient management of waste to which government appears incapacitated (Kofoworola and Farinloye Oral Interview, 2023).

Another form of solid wastes generated is sawdust. These were openly burnt without regard for sound environmental management. Sawmills of various sizes were scattered all over the shores of Lagos. Hence, one of the greatest environmental problems facing Lagos State have been how to properly dispose these wastes being generated daily by the ever-increasing activities of saw mill operators (Ismaila, Oral Interview, 2023). In the absence of proper disposal methods, these wastes were burnt in the open air along the bank of lagoon of Lagos in places like Oko Baba, Ebute Meta, Badagary among others (Izoma, Oral Interview, 2023). As the demand for wood and its product increased, the volume of wastes generated by sawmill industries in Lagos State were increased and thus, higher emission from the combustion of the wastes (Farinloye, Oral Interview, 2023). There have been reports from residents on both environmental and health effects of emission from combustion processes which affected numbers of children and adults especially people living close to landfills, sawmill, roads, factories etc. And it must be stated clearly that air pollution is a major threat in Lagos State (Chikwudi, Oral Interview, 2023).

5.3 Noise Pollution

Over times, industrial activities of people in construction industries, recording studios, air and sea ports, transportation firms in Lagos have not just caused noise pollution but have worsened the case of the already polluted environment in affected areas (Kuka, Oral Interview, 2023). Similarly, the proliferation of religious houses and places of worship with amplified loud speakers produce unpleasant noise sensation and irritation to the eyes, and when especially when they are shouting at their loudest voices to the discomfort of every resident within 2km radius (Lowoori, Oral Interview, 2023). The use of loud horns of motorists/vehicles, heavy duty, trains, etc. at their loudest level in towns and cities are another disturbing issue of noise pollution in Lagos State. In a similar vein, due to the challenges faced from the public power supply-generating sets from individual residents and business firms make a hell of noise, thus, causing disturbance to the public. Sometimes as early as 3 – 4 am, 4 – 5am when most residents are still sleeping, worshipers disturbed the public in the name of prayers. These acts are mostly common in mosques and the new generational churches (Daranijo, Oral Interview, 2023).

The World Health Organization (2011), recommends an industrial noise limit of 75 Decibels (dB) so, much that any sound level above 75 dB is already a pollutant. Nevertheless, in dance halls, recording centres, air ports, rail terminals etc. noise is normally heard above 115 dB sound level that must be avoided. This has to be avoided because, at this level, short- or long-term effects alike that can cause damage to the tympanic membrane the ear drum is likely to occur. This may either be injurious to the ear or lead to loss of hearing ability which may result to deafness to the affected members of the society (Madu, Oral Interview, 2023). Orisaleye et al, (2018) investigated exposure to noise among workers in a steel company in Ikorodu and the level of awareness of workers on the effect of industrial noise on hearing. The authors obtained data by randomly distributing 116 questionnaires, and noise mapping of the entire factory. The results of the study showed that noise levels of 49 dB (A), 72 dB (A), 86 dB (A), and 93 dB (A) were obtained around the administrative area, maintenance workshop, grinder floor, and finishing stage respectively. The authors inferred from the results obtained that although 93 percent of workers were aware that industrial noise affects hearing, only 27 percent of the workers possessed hearing protection, and only 18 percent actually used them at all times. The authors warned that even though there was high level of awareness that industrial noise causes occupational noise-induced hearing loss, there was a need to initiate other control measures such as strict compliance with regulation.

Orekoya et al, (Oral Interview, 2023) discussed the extent of noise pollution from sawmill activities in Itamaga Ikorodu, Lagos State. It was found that people complained of both auditory and non-auditory effects as a result of the noise generated by the plant. Over 90 percent complained of experiencing tinnitus while approximately 87 percent and 72 percent reported having headaches and hearing ailments respectively. Others reported annoyance and difficulty in ability to concentrate and double hearing/ hearing loss (diplacusis). Noise contributed to development of cardiovascular problems like heart diseases and high blood pressure. From experience, people exposed to high noise levels have more circulatory problems, cardiac disturbances, neuro-sensory, motor impairment, and even more social conflicts at home and at work (Hameed, Oral Interview, 2023). Dacosta, (Oral Interview, 2023) said primary sources of industrial noise were from machines and generators. He worked in nine manufacturing companies in Lagos, where he observed that noise generated by different

plant and machineries utilised in the production processes were the cause of industrial noise pollution in Lagos State. He revealed that electricity generating sets were the major sources of industrial noise and people around were at the receiving end of more than fifty percent of the effects of industrial noise, with the effects being more physiological than psychological.

5.4 Landfill Issues in Lagos State

Solid waste management in Lagos State is undertaken by the Lagos State Waste Management Authority (LAWMA). Open dumping of waste is the official method of waste management in Lagos State. The city has three major official waste dumps, the largest and most significant of which is Olusosun, which measures 42 hectares and is located in Ojota area within the Kosofe Local Government Area of the Lagos metropolis (Iwejingi, 2011). The second dump is the Solous Dump, which measures three hectares and is located in Igando within Alimosho Local Government area of the state along. The third dump is in Abule Egba, and is 10.5 hectares, and also located in Alimosho Local Government Area. The city also grapples with illegal dumpsites which are vacant parcels of land that people have unlawfully converted into dumpsites. Lagos residents currently generate 10,000 metric tons of waste daily, at an average rate of 0.5kg of waste per individual (Iwejingi, 2011). Ayodele and Simeon (2012) reported that in 2012 alone, 2,400 metric tons of solid waste was disposed daily at Olusosun waste dump alone. The quantum of waste is constantly increasing due to a persistent population growth and industrialisation. The waste is collected via a tripartite arrangement that involves LAWMA-owned trucks, LAWMA contractors, and Private Sector Participation (PSP) trucks. The LAWMA-owned trucks collect waste generated mainly from markets from the highways; the LAWMA contractors handle industrial waste; and the PSP trucks collect domestic/household waste (Izoma et al, Oral Interview, 2023).

All waste collected is deposited on platforms at the official waste dumps after each truck is weighed at the weighbridge which is located at the point of entry. The city previously experienced indiscriminate waste dumping, uncontrolled garbage, and littered pavements, roads, and sidewalks. These waste practices led to flooding, and created an aesthetic eyesore at that time. Also, LAWMA could only collect a fraction of the waste in the municipality, which it transferred to its open dumps. (Izoma et al, Oral Interview, 2023). The indiscriminate dumping practices have been controlled to a fair extent before 2015 that is prior to Governor Akinwunmi Ambode administration, although there were still noticeable refuse in parts of the city especially the Lagos Island. Largely, waste collection improved in the first two years of Governor Ambode that is 2015 - 2017, as the mountains of waste on roadsides have disappeared with improved collection and transportation of waste but later collapsed (Ayobami and Efe, Oral Interview, 2023).When Olusosun landfill fire occurred in 2018 this caused environmental disaster in a large scale as harmful emissions were on rampage, such as formaldehyde, hydrogen cyanide, hydrogen sulfide, nitrogen oxides, among others. Particulate matter in the smoke created during landfill fires also exacerbated respiratory and other health complications in those lived in the immediate environment, and those responded to the fire. Obviously, this was why the Lagos State government has ordered the residents of Olasosun to relocate (Mofolayan, Oral Interview, 2023).

In the 1990s, the dumpsite was located on the outskirts of the densely populated Lagos metropolis, but due to population explosion accompanied by urban housing expansion, the site later found itself sitting amidst the commercial and residential enclaves of Ojota, Alausa, Oregun and Ikosi. In those years, one is not sure whether the government instituted improved methods of landfill management at Olusosun. For example, factoring the most possible cause of spontaneous combustion, the government would have introduced methane gas detection and collection methods, to ensure that gas collection systems are not overdrawn and that collected gas is either flared or converted in energy (Awujoola and Jayesimi Oral interview, 2023). As it turned out eventually, a private company (Vision Scape and Cleaner Lagos) took over the management of the Olusosun dumpsite 2017. But the tragedy was that nobody would tell us about the whereabouts of the thousands of residents that have been told to relocate to other safer environments. And indeed, the sad reality was that there were many among them who were so poor that they cannot afford to relocate. In fact, some would prefer a temporal but deadly inhalation of the pollutants in the atmosphere to a spell of homelessness in uncharted waters of urban destitution (Ike, Oral interview, 2023).

Let us not forget the conflict between the Lagos State government and private sector participation (PSP) during Governor Ambode administration in Lagos, who were not happy with the manner the Lagos State administration has sidelined them in the implementation of the Cleaner Lagos Initiative Policy. In addition, we must not be blind to the fact that the Olusosun dumpsite burnt for over two weeks and this seriously endangered the environment and the people around at the period (Ike and Adefarati, Oral interview, 2023).

Table 1: Composition of Lagos State Waste Stream

Waste Type	Percentage of Total Waste
Organic	60 percent
Plastic	15 percent
Glass	5 percent
Paper	10 percent
Metal	5 percent
Others	5 percent

Source: Ogunba Adeola (2016), Hammed and Izoma (Oral Interview, 2023

Table 2: Some Major Landfills / Dump sites in Lagos State

Landfills / Dump sites	Size	Depth	Year Commissioned	Scheduled Closure Date	Estimate of Waste at Site (million tons)
Olushosun	42 ha	8-15m	1992	2014	1.7
Abule-Egba	10 ha	12m	1983	2009	1.3
Solous	5 ha	9m	1981	2008	1.4
Gbagada	2 ha	5m	1988	2009	1
Jinti Ijede/ Ewu Elepe	7 ha	8m	1992		1.4
Epe	5ha	5m	1998		1
Oke Afa Isolo	2 ha	6m	1984	2009	1
Kesse Badagry	5 ha	5m	1990		1.2

Source: (Oyeniyi, Mabadeje and Jayesimi, Oral Interview, 2023)

5.5 Ground water Pollution by Solid Waste and Wastewater

Oyegoke, Adeyemi and Sojobi, (2012) observed that the rapid growth of cities and the large population sprawls that ensue are responsible for municipalities inability to deal effectively with solid wastes and wastewater generated from anthropogenic activities. In particular, the improper handling of toxic wastewater as shown by the loading of water bodies from the municipality, and by permitting industries to eject untreated effluents, are a potential source of health problems in epidemic proportions. In the same context, Oyegoke, Adeyemi and Sojobi, (2012) similarly noted that urbanisation, which incorporates the "inseparable" industrial development component with the attendant generation of large quantities of waste and sewage, has severe polluting impacts on the hydrological cycle. These statements are typified in Lagos State.

In 2002, Ikem et al monitored wells in the vicinity of a waste dump site in Oworonshoki, Lagos. They found that groundwater from these wells require further purification to make them suitable for human consumption because the levels of contamination in them are higher than levels permitted by World Health Organisation guidelines for drinking water. In 2008, Longe and Balogun in another research project, researchers drilled monitoring boreholes near the dumpsites in Abule Egba and Igando with the objective of evaluating the quality of soil and raw water samples through laboratory analysis. They found that the first borehole investigated at Abule Egba is prone to leachate contamination due to its shallow depth of 30 meters, and the absence of any significant impermeable layer (clay) to protect the groundwater occurring there. They recommended that boreholes constructed in that vicinity should exceed 42 meters in depth in order to avoid infiltration of leachate contaminants (Longe and Balogun, 2008).

The same researchers conducted a surface geophysical investigation of Olusosun waste dumpsite and a transfer loading station in conjunction with LAWMA in 2008. It was done, inter alia, to delineate possible leachate contamination within the dumpsites. Their report indicated that Olusosun, as the biggest waste dump in Lagos metropolis, has no liners or leachate collection system and therefore it has the potential to cause groundwater contamination especially within its southern flank (Longe and Balogun, 2008). In the same year 2008, Adeyemi et al investigated the physicochemical and microbial qualities of two wells and two boreholes within a closed waste dump Odo Iya Alaro in Kosofe within Lagos metropolis. In terms of physical chemistry, they found that the wells contain very high concentrations of heavy metals such as lead, cadmium, and chromium. In terms of microbial characteristics, they also found that harmful coliform bacteria including ecoli, salmonella and shigella were also present in the wells.

In 2013, Longe assessed the level of groundwater contamination through leachate percolation from the Solous waste dump. Results showed that the quality of the groundwater underlying the waste dump had become moderately affected by the leachate from the waste site. Some of the chemical parameters used indicated that the levels of chromium, nitrate, and phosphate in the water samples were above the highest permissible level allowed by Nigerian Standards for Drinking Water Quality and the World Health Organisation Standards. They projected

that with time, the accumulation of leachate at the base of the dumpsite could break into the groundwater. But the very same fact, they said, could still enable leachate ponding and outflow into both surface and groundwater (Longe, 2013).

Picture 1: Polluted well in Lagos State

Source: The Researcher's Photograph

6. Conclusion

Lagos State Wastewater Management Office (LASWAMO) has outlined unhealthy practices within the Lagos metropolis that have the potential to pollute groundwater. These are: septic tanks being piped into the public drainage; pipes leading from ongoing construction of septic tank to a nearby canal and over-full septic tanks spilling seepage into the environment. The indiscriminate discharges of untreated wastewater from homes into open drains and water channels have raised fears about underground water pollution in the metropolis (Olorunnibe, Oral Interview, 2023). Health is inextricably linked to the environment, in the case of Lagos State Day to day activities of residents thus damaged natural environment in one way or the other also resulted in damage of human health. The residents were fully aware of the need to use the health facilities in the state. Most of the resident visited the clinics for the treatment of malaria. Other health cases reported were typhoid, dysentery, cholera and asthma. The study also established that monitoring and mandatory agencies of government were less effective on environmental health challenges. Many of the top risk factors contributed to illness and disability in Lagos State were directly tied to environmental health problems.

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