Waste Dumps and Their Management in Lagos Metropolis

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Abstract

This paper has identified major sources of wastes, compositions and the challenges posed. The schemes for evacuation and disposal of wastes and management of dumps have not been realistic or effective in the Metropolis. Wastes are often widely indiscriminately dumped- measuring 784 x 625 x 22 m^3 at Ojota, 801 x 649 x 23m^3 at Oke Odo, 732 x 622 x 17m^3 at LASU Road and 66 x 582 x 28m^3 at Oke Afa. The Oke Afa dump is the oldest in the metropolis. The composition is organic and inorganic, degradable and non-degradable. Though they are of some benefits to large number of scavengers, they are of great challenges to the governments and people of all works of life in the metropolis generally and the entire vicinities in particular. The paper is of the opinion that dumping of waste at built-up areas within the metropolis should stop immediately; and recommends alternatives. There must be effective logistics for collection, transportation and eventual management at designated Dumps that should locate outside the built–up areas. At such locations Governments and investors should be supported and encouraged to build fertilizer plants that will make use of the degradable and organic wastes while the non degradable could be separated and compressed as raw materials for other plants. It is hoped that more Lagosians other than scavengers will be positively massively gainfully engaged.

Background to the Study:

Lane and Peto (1995) and Williams (1995) assert that the historical development of waste treatment and disposal has been motivated by concern for public health. The industrial revolution between 1750 and 1850 led to many people moving from rural areas to the cities, a massive expansion of the population living in towns and cities, and a consequent increase in the volume of waste arising. The increase in production of domestic waste was merged by increases in industrial waste from the burgeoning new life scale manufacturing processes. The waste generated contained a range of materials such as broken glass, raw steel metal, food residue and human waste, and was dangerous to human health. In addition, it attracted flies, rats and other vermin, which in turn posed potential threat through the transfer of diseases. This leds to an increasing awareness of the link between public health and the environment.

In order to deal with these potential threats to human health, legislation was introduced on a local and national basis in many countries. For instance in the united kingdom throughout the latter half of the nineteenth century, a series of NUISANCE REMOVAL AND DESIST PREVENTION ACTS were introduced which empowered local authorities to set up teams of inspectors to deal with offensive traits and control pollution within city limits. In the United States of America, early legislature included the 1795 law introduced by the corporation of Georgetown, Washington, DC, which prohibited waste disposal on the streets and introduced the requirement for individuals to remove waste themselves or hire private contractors. By 1856, Washington had a city- wide waste collection system supported by taxes. By 1915, 50% of all major US cities provided a waste collection system, and this figure has risen to 100% by 1930{NEAL AND SCHUBUL 1987: McBean et al 1995}. This trend spread to other part of the world particularly the developed world.

Following the 2nd world war waste treatment and disposal was not seen as a priority environmental issue by the general public and legislature, and little was done to regulate the disposal of waste. But, a series of incidents in the late 1960's and 1970's alighted waste as a potential major source of environmental pollution. Then series of toxic chemical waste dumping incidents led to increasing awareness of the importance of waste management and the need for a more stringent legislative control of waste. Today in UK, USA, Australia and even in South Africa majority of waste is disposed of in land fill sites. The modern sites are well designed, constructed and managed, and many have energy recovery utilisation of the derived land fill gas. While land fill remains the major option for waste disposal in the UK, and some parts of USA and Canada, increasing regulation has placed tighter controls on leachate and land fill gas treatment, monitoring and care after site, with a consequent increase in disposal costs. Other new developments in land fill design and operation have resulted in the concept of the flushing bio reactor land fill, which circulates the leachate to increase the rate of waste degradation. The combustion of land fill gas to produce energy in the form of elasticity or power generation or district heating has now become the norm for modern land fill. Incineration has either been in decrease as a waste disposal option. But recently, incinerators have been constructed, are under construction or in the planning stage. The incineration of waste with energy recovery fear either elasticity generation or district heating has been

developed in the 1990's to become an economic viability comparable to land fill. Several industrial waste, sewage sludge and clinical waste incinerator projects were initiated during the 1980's and 1990's. These incinerators tend to have smaller through puts of waste, and because of the higher cost of disposal of these types of waste are cost effective compared with other forms of disposal. In many cases, the type of waste indicates that incineration is not only the most economic option, but also the best practicable environmental option.

Incidentally, the schemes for mere collection, evacuation and disposal of wastes have not been sufficient, realistic or effective in most cities and towns particularly of the Third World Countries, (Uchegbu, 1998 and Pamham and Rispin 2001). Thus, the entire landscape is fast becoming refuse web and the situations are getting worse by the day (Wilikin, 2002): Wastes are often widely indiscriminately dumped on virtually every available space in residential neighbourhood, along streets and roads, on highways, beside and around houses, markets, hospitals, schools and offices, etc. It is attempt to be modest that made a few individuals and organisations gather wastes in their compounds and around their premises and commission registered Waste Disposal Companies to collect and dump in the landfills. Some of such landfills in Lagos Metropolis are at Ojota, LASU Road, Oke-Ode, and Oke-Afa.

Generally for Nigeria, as far back as 1989, Onibokun asserts that 35% of Ibadan metropolitan household, 33% of Kaduna city and 44% of Enugu built-up areas lack access to waste collection and management machineries. 20 years after, the situations seemingly appear to remain the same and even worse in the cities and towns of the country, (Olumide, 2008).

There have not been exhaustive works on Waste and Waste Management in Nigeria generally and different parts of the country in particular. Bako et al (2007) recently worked on Air Pollution and Climate Change in Nigeria. It is with particular emphasis on pollutions resulting from Wastes. Ogunleye (2007) writes on Urban Solid Waste Management and Recycling for Cultivation and Implications and Challenges for Urban Planners. Their works merely quantify and qualify wastes and pollution and their effects in different parts of the country and for different Land Use. Specifically, Bello (2007) writes on "The Effects of Ojota Waste Dump on the Surrounding Property Values." The work is from the perspective of Estate Valuer. It is restricted to the effect of burning, the subsequent smokes and obnoxious odours on the values of property within the vicinity. Aderogba (In Print) worked on Ojota Dump, but the entire Lagos Metropolis needs to be examined. Many areas are still of great concern, (Ogunnowo and Aderogba, 2007 and Bello, 2005). None of the works dwell into details of the composition of the wastes and the holistic effects on human, materials, plants and the general environment in order to be able to appropriately deduce the solutions to the challenges posed.

Therefore, this work focuses on Selected Dumps across the Metropolis. It aims at tracing the history of the sites, the composition of the wastes, size of the Dumps, and suggest alternatives to the existing Dumps and the methods of management.

The Lagos Metropolis:

The city of Lagos sprawls over several large islands separated by creeks on a vast lagoon on the Bight of Benin, bordered by the Atlantic Ocean. Lagos was a city of 500,000 people in the late 1960s, and home to three million people by 1975. Its population currently stands at 17.8 million. It is still growing at an average of 5% per annum. Explosive population growth defines Lagos: the city qualifies as a 'mega city' (defined as being home to a population in excess of

ten million), joining the likes of Sao Paulo of Brazil, Mexico City of United States of America, and Cairo of Egypt. The Government estimates Lagos' population could be 25 million by 2015 as rural Nigerians turn their backs on the countryside to move to the country's biggest city. According to the United Nations (2007), Lagos "will be invested with such power that at many levels she will act as city state, independent of national or regional mediation." Although her population is fuelling economic growth, it presents profound challenges too. The city struggles to make a "viable society" with the big difference in the wealth of her people located in different parts of the metropolis. Figure 1 shows the usual hustling and bustling International Air Port that used to be at the outskirt of the city that is now within. It is usually full of activities that distinct it as an International Air Port in ai an International city.

The State Government is based on the island of Ikeja, IT companies have set up there too, and it is the city's industrial centre. Lagos Island where most of the large banks, multinationals, department stores and key businesses sit is the financial heart of the nation. Lagos State may be the smallest of all the 36 States of Nigeria, and has none of the oil riches like the Delta region, but its unique energy has made it the economic powerhouse of the county and given it increasing clout within the wider region. Nigeria now accounts for 50%

Fig.1: Murtala Muhamed International Airport, Ikeja within the Lagos Metropolis

of West African GDP, and much of that is attributed to Lagos. She is the financial and cultural centre of Nigeria. The government built a new capital in Abuja in 1990 although many of the ministries and diplomatic missions are still based in Lagos.

There is no national of the world that is not represented in Lagos. The citizens of the ECOWAS member states are the most plentiful.

However, the Government has got to deal with the transport chaos, pollution, energy and power, waste management, and poverty this uncontrolled growth causes. After decades of neglect and under development Nigeria infrastructures – from roads to railways, from electricity generation to water supply – are in need of a drastic overhaul and expansion. But

nowhere is this more apparent than in the West African giant commercial capital, Lagos where the entire population struggle to cope on a daily basis with crumbling roads, antiquated transport services, hopelessly inadequate power generation, wastes, and critical shortfall of clean water supplies and housing stock among others. Not only does the lack of adequate public infrastructure made the lives of Lagosians much more arduous than they need be, it also acts as a significant control on the economic growth, deters domestic and foreign investments, and denies all Nigerians a share in the economic prosperity that should be accompanying the record rise in the international price of oil. Lagos State in particular stands to benefit from the nation's upward trajectory. It accounts for about 12% of national economic output, and is the second most important contributor to national economic activity after the oil–rich River State. Clearly, the sheer size of the infrastructure deficit makes the metropolis and the state in general to shoulder the entire burden of providing new infrastructure by itself making it critical that PPP initiatives step in to fill the gap.

Incidentally, all of these inadequacies started since when Lagos ceased to be the political capital of Nigeria. Its infrastructure has not risen to respond to the growing population. Thus, the huge gap that needs to be filled in the form of roads, railways, ferries, health care, education, sport facilities, water and waste management in particular.

The metropolis faces the same infrastructure challenges as many other fast-growing cities: An urgent need to overhaul its roads, improve its inadequate water provision and sanitation, urgently require effective and efficient logistics for waste disposal and management, and dramatically increase power supply to its over 17.5 million inhabitant, and yet limited government funds to meet these demands. At the moment, Lagosians who can make up for the woeful provision of services themselves, are sinking boreholes in their backyards for water and installing their own generators as an alternative to the city's dire power supply. While some of these have been doing fairly well, the issues of waste have been major bane to the government and people. Like all fast-growing cities, Lagos faces huge challenges, but political will and investors' interest could turn the Lagos vision of the present government as a "model African mega city" into realty.

It is not unlikely that the large population coupled with the inability of the metropolitan government to provide adequate infrastructure, and the living habit of the inhabitants that compounded the issues of wastes. Apart from the few designated Waste Dumps, wastes litter roads, streets, markets, store areas, schools and office premises, gutters and pathways – to the points of embarrassment. Among the designated Dumps are Ojota, Oke-Odo, Oke-Afa and LASU Road Dumps. These have been selected for detail studies.

Concept of Wastes and Methodology:

Williams (1998) asserts that what represents waste to one person may represent a valuable resource to another. He went further to say that "waste must have a strict legal definition to comply with both United Kingdom and European Community law." That is, at least in Europe. The regulations covering waste use a variety of terms to describe different types of waste, to include 'controlled', 'household,' 'industrial,' 'commercial,' 'special,' 'active,' inactive,' etc. In such cases, strict definitions of waste have financial and legal implications for business, local authorities and Government. In addition, for the requirement of definition of waste,

agreement on definitions and classifications of waste are required for the accurate formulation of local, regional and national waste management planning. In the United Kingdom, the Environment Agency is responsible for the collection of data on waste which is used by local authority planning department in the preparation of their Waste Local Plans and for regional waste management planning. Waste data in the form of types and quantities of wastes are required at National level by the Secretary of State for the Environment to fulfil obligations for a National Waste Strategy under the EC Waste Framework Directive. Consequently, the interaction of waste planning authorities, including local planning, with Environment Agency and also with the waste collection authorities and Waste Disposal Authorities is desirable. This ensures that common terms and methods are used in the collection of waste data.

The classification of waste is difficult since there can be variation in composition between different loads of waste, but it is necessary for consistency in the description of the waste wherever the waste has arisen and whoever has described it. In addition to accurate definitions of waste, reporting methods are also required to be uniformed. However, by its very nature waste is a heterogeneous material and difficult to describe, define and classify. In many instances the waste will be a mixture of different types, or may be on the border between two categories. Waste can vary in composition on a daily, monthly and seasonal basis or from location to location. The designation of waste as hazardous has financial and legal implication for any organisation. A broad classification of waste includes controlled waste, (household waste, industrial waste, commercial waste, clinical waste), and uncontrolled waste, (inert waste, hazardous waste and municipal waste).

The United Kingdom national waste strategy and the European Waste Framework Directive have at their centre the hierarchy of waste management, and the basis of the strategy is to encourage movement up the hierarchy and thereby increase the levels of waste reduction, re-use and recycling. A key element of the strategy is the compilation of accurate data on waste arisings. This enables recycling targets to be set and responses measured, and the diversion of different waste types from disposal to be monitored.

Dumps otherwise known as Landfills or Tips are usually for burning of wastes to dispose of them. It is a common practice in most parts of the world, (Simolen 1992 and Miller, 1990). They were often established in disused quarries, mining voids or burrow pits. Simolen (1992) asserts that a properly designed and well managed landfill can be a hygienic and relatively in–expensive method of disposing of Waste Materials. "Older, poor-designed or poorly-managed landfills can create a number of adverse environmental impacts such as wind-blown litter, attraction of vermin and generation of liquid leachate." According to him, another common by-product of landfills is gas (mostly composed of methane and carbon dioxide), "which is produced as organic waste breaks down anaerobically. This gas can create odour problems, kill surface vegetation (and ornamental plants); and it is a Green House Gas." It is not welcome scenery anywhere, anytime - usually very unpleasant, (Ogunnowo and Aderogba, 2007).

Design Characteristics of a Modern Landfill includes methods to contain leachate such as clay or plastic lining materials. Deposited waste is normally compacted to increase its density and stability and covered to prevent attracting vermin (such as mice or rats). Many landfills also

have landfill gas. Gas is pumped out of the landfill using perforated pipes and flared off or burnt in a gas engine to generate electricity.

The construction of a landfill requires a staged approach: The designers are primarily concerned with the variability of a site. To be commercially and environmentally viable, a landfill must be constructed in accord with specific requirements which are related to location (easy access to transport, transfer station, land value, costs of meeting government requirement, communities served, type of construction and nearby rivers, streams, flood plains and creeks), capacity, protection of soil and water, nuisance and hazard management, costs, feasibility studies and other site investigation. But, by and large, what are the situations in Lagos Metropolis today and what are the needs for environmentally friendly landfill and Dumps for sustainable development.

Literature on Waste and Waste Management were extensively reviewed. Interviews were conducted with management and staff of the Lagos State Ministry of Environment and Physical Planning, Lagos State Waste Management Authority, Health Department of all the Local Government Councils in the Metropolis, and the residents. Those that patronize the site were also interviewed. They all provided information and data on the history, challenges and benefits of the sites and what could be done to alleviate the menace of the site. Visits were made to the sites. At each time of visits, shovels, tapes, iron rods and simple surveying equipment and recording materials were taken along. They were used to take some salient measurements. During the visits, commonly dumped items were identified. Hospitals and maternity homes, schools and colleges, business centres and markets, offices, hotels and restaurants etc that dump wastes at each of the sites were traced and visited. The offices of some registered companies that were commissioned to collect wastes on behalf of households and establishments were visited. The heads of administration in each of the establishments visited were interviewed on the composition, effects and management of wastes and alternatives to the traditional forms of management. On the whole, 750 individuals of various professions and status of different companies, offices and residential areas were interviewed.

Data collected were only classified, tabulated and percentiles calculated for presentation, analysis, and discussions. Rigorous statistical analyses were not implored. With the assistance of Federal Meteorological Department at Oshodi (Lagos), Meteorological equipment were installed and readings taken to ascertain micro climate changes. A principal of one of the schools around also assisted in the set-ups, readings and observations on the site and the equipment.

The words ''landfill,'' "dump," "site," and "tip" were used interchangeably to mean "place where waste or rubbish/garbage is taken and left." In this study, wastes have been broadly divided into two: Degradable and Non-degradable.

Materials and Results:

The site spans through an area of about 0.785 by 0.625 km^2. It is about 8m above the ground level and about 14m deep. That is, it is about 10.794 million m^3. It is massive. The composition of the waste can be broadly divided into two: Degradable and non-degradable. The Degradable includes but not limited to:

- Living plants and animals;
- Waste food from homes, hotels, cafeteria and restaurants;

-Human wastes, dung and birds and animal droppings and wastes;

-Yam, cassava and potato peels;

-Powdered and evaporated milk;

-Melon and melon shells;

-Vegetable, flowers and fruits;

-Whole egg;

-Palm kernel and palm fronds;

-Used clothes and cuttings;

-Carcass of rodents and other animals;

-Pastries and bakes;

-Paper and paper cartons of various shapes, sizes and grams;

- Old books, journals, magazines, and novels;

-Old shoes, caps and hat;

-Cigarette and tobacco;

 -Wood of various grades, shapes, length and sizes;

-Insects, rodents and flies;

-Tubers of yam, cassava and potatoes; and

-So many other items that could not be identified.

Though some of these have been on site for long period of time, sometimes buried under the most recently deposited refuse, it is hoped that with time, they will get decomposed and degraded; and become part of top soil, (Hickman et al 2005 and Miller 2005). The decaying ones have attracted a lot of insects, ants, rodents and flies. On the other hand, there are non-degradable and non-decaying materials; some of them areorganic. Again, among these are:

-Used types and tubes;

-Cans (plastic and metallic) of various sizes, colours and shapes;

-Cellophanes of various grades, sizes and colours;

-Used bottles of various colours, sizes and thickness;

-Used polyesters/synthetic cloths and cuttings;

-Foot mats, carpets and rugs;

-Broken glasses and ceramics jugs, cups and plates;

-Used, unserviceable telephone handsets;

-Children disposable nappings and toys;

-Used and unserviceable electronic sets;

-Used iron and aluminium home utensils;

-Rain coats and boots;

- Electric cables, fittings and appliances;

-Sand, gravel and stones;

-Blocks and concrete rubbles;

-Paints (emulsion, glux and texcoat);

-Charcoal and ashes;

-Hose and stocks;

-Water hose and pipes of various sizes and colours;

-Pressing iron;

-Hanger and ropes made of iron / wire and plastics;

-Grease and other petroleum products;

-Hospital equipment

-Metals in form of rods, pipes, plates and casts;

-Cosmetic and cosmetic containers;

-Jewelleries and decorations;

-Used bags, boxes and port-man-teau;

-Roofing sheets;

-Wigs, hair and hair attachments;

-Chalk and marble wastes;

-Motor vehicle scraps and used spares;

-Motorcycle and bicycle scraps and used spares;

-Hat, caps, canvas and other foot wears; and

-Uncountable and unidentifiable piece and pieces of materials.

There are more of those that will never decay. They are niches and habitats to large number of rodents, reptiles and insects especially when the items remained undisturbed for considerable period of time.

In addition to the solid materials and items, homes, hospitals, hotels, cafeteria and manufacturing and servicing industries dump various chemicals and solutions at the site. These include drinks, paints, drugs, acids and base of various elements, perfumes, milk, honey, sprays e.tc. All of these items come from distances of between 0 km and 11.35 kms away in trucks, cars and human carriage-directly and indirectly. Some of the materials and depositors were traced to the manufacturing and food processing industries that are located within the metropolis - Opamore (0.4km), Ogudu (4.3km), Alapere (4.7km), Sangisha (5.3km), Obanikoro (8.1km) Magodo (8.5km) and Omole (11.35km) – all within arrange of 11.35 km. See Table I: Selected Nearest Location to Ojota Waste Dump.

Name	Distance(Km)	Predominant Land Use
Ojota	0.00	Residential and Commercial
Opamore	0.42	Residential
Ososun	2.53	Residential
Onisigun	3.24	Residential
Maryland	3.96	Residential and Commercial
Ogudu	4.33	Residential
Oregun	4.34	Industrial and Residential
Erukan	4.52	Industrial and Residential
Alapere	4.70	Residential
Onigbongbo	4.86	Residential
Sangisha	5.34	Residential/Offices
Anthony	7.80	Residential
Alausa	6.93	Govt. Secretariat/Offices
Obanikoro	8.16	Residential/Offices
Olowoira	8.43	Residential

Magodo	8.55	Residential
Oshodi	8.79	Commercial and Residential
Agidingbi	9.06	Industrial and Residential
Oworonsoki	9.27	Residential /Farming /Fishing
Shomolu	9.61	Residential
Shogunle	9.63	Residential and Industrial
Iseri-oke	9.64	Residential / Farming
Orile-Oshodi	10.63	Residential and Commercial
Odogun	10.39	Residential and Industrial
George	10.50	Residential and Commercial
Iseri	10.53	Residential and Commercial
Bariga	10.55	Residential / Fish Farming
Aguda	10.70	Residential and Commercial
Omole	11.35	Residential

Source: K. A. Aderogba (2007) Field Work.

The heaps of wastes and the dump are not without some benefits, however. The landfill was found to be of great advantage thus:

-The residents of the immediate and distance locations have got where to dispose wastes;

-Decomposed organic refuse are in turn collected as manure for sylviculture and for nursing ornamental plants;

-Some unemployed youths go to this site to pick used cloths and plastics containers for recycling (and reuse);

-The wastes are purportedly and sometimes inadvertently used to fill man-made pits around;

-Some citizens are employed as curators - keeping the environment;

-The extreme edges of the landfill are particularly very fertile and thus cultivated for maize, vegetables, and pepper and some arable crops in particular;

-Lunatics get foods, and drinks to quench their thirsts;

-It is home (hide outs) for some homeless and lunatics and "Area boys'' of the metropolis; and

-Mere looking at the smoke generated from the burnings easily tells the direction of wind at a point in time.

But these could not be enough reasons for dumping of wastes to continue as it is now. It is perpetually under fire and thick smoke, gases and steam emitting from all over the site, Hence the menace:

-It is a breeding ground for ants, mosquitoes and flies that invariable invade residential homes, restaurants, beer parlours, hospitals and manufacturing industries around;

-It is breeding ground for rodents, reptiles and other vermin;

-The aesthetic value of the scenery is completely disrupted and destroyed;

-Occurrence of wind-blown litter, vermin and liquid leachate are not uncommon;

-The environment is filthy as a result of methane and other obnoxious gases and odours generated and spread to the surroundings;

-The temperature and other elements of microclimate are adversely affected;

-Values of the residential and commercial property have been adversely affected and resident could no longer bear the usual smoke, odour and heat; and

-Membership of churches and mosques around has drastically reduced.

A resident of the community interviewed has this to say; he expressed himself with anger:

.....house rent is relatively low here.....nobody wants to live under smoke again.....flit or fumigate today, the next day, the entire house is infested with mosquitoes,...rats and wall gecko at night, lizards and other reptiles during the day. Wash your dresses and hang them outside to dry, under two to three hours, it will be smelling of smoke.....you cannot breadth well....anywhere you go, the smell of smoke is following you....government has to stop this..... what about smoke and dust particles? It is horrible... and unfortunate..... the site now pose serious health hazards, unless something is done about it .... the situation may have gone out of hand ... .the Lagos State Waste Management Authority has given up ...... and those of us that have our houses here, we cannot move the houses.

They are of the opinion that the incessant and prevalence of parasites, tetanus, malaria, hookworms, diarrhoea and cholera at sometimes are due to the prevalence of flies, mosquitoes, insects, ants, rodents, reptiles and other carriers of these diseases and germs.

Table II: Average change in the Micro-Climate Elements.

Elements	Average Change
Temperature	1.7%
Relative Humidity (RH)	4-8%
Wind Speed	2-5km
Visibility	-30 - -40%
Radiation Intensity	-17 - -26%
Illumination	-22 - -50%
Gaseous (SO_2) Pollution	10-30%
Nuclei Solid	21 times
Solid Dust	35 times
Organic Bacteria	25-45 times
Ionization(Total)	8-16 times
Others	8-20 times

Source: Aderogba, K. A. (2007) Field Work.

Table III: Perceived Effects of Wastes and the Landfill.

Characteristics	No of Respondents	% Propotion
Unattractiveness of Environ (Scenery)	750	100
Odour	750	100
Smoke	750	100
Traffic (Vehicular)	432	57.60

Traffic /(Human)	386	51.47
Noise	292	38.93
Climate Change	685	91.33
Methane Gas	750	100.00
Filthiness	750	100.00
Vermin	738	98.40
Flies and other Insects	742	98.93
Others (Specified)	638	85.07

Source: K. A Aderogba (2007) Field Work

Table II shows the average changes in the micro-climate elements. The dusts, smokes, gases, odour etc have predominantly influenced the micro- climate- the temperature, Relative Humidity (HR), Wind Speed (and direction), and sunshine and radiation intensity. Others are illumination, pollution, gaseous (SO_2) solid nuclei, solid dust, organic bacteria, and total ionization, (Givoni 1997 and Simpson 2005). See Table II, it is more revealing: Temperature increased by 1.7°c, Relative Humidity (RH) by 4-8%, radiation intensity of the sun 17-26% and so also illumination -22% to -50%. Solid dusts increased by about 35 times, organic bacteria increased by about 25 to 45 times, and so also other elements of the micro - climate. Furthermore, Tables III and IV show the effect of the waste and the entire landfill in the vicinity. The 750 (100.00%) of respondents are of strong perception that the Environment

Table IV: Perceived Environmental Pollution.

Types of pollution	No of Respondents	%
Air	750	100.00
Water	668	89.07
Land	748	99.73
Noise	266	35.47
Crops/Vegetation	631	84.13
Scenery	744	99.20
Aesthetic Value	745	99.33
Food	430	54.33
Others /(Specified)	520	69.33

Source: K. A. Aderogba (2007) Field Work.

becomes unattractive, always covered with smoke (twenty four houses of a day and seven days of a week), filthy and methane filled. Vehicular traffic (57.60%), human traffic (51.47%), general climate change (91.33%), rodents' infestation (98.40%) and flies, ants and other insects (98.93%) are major effects of the landfill, Table III. The general environment is similarly perceived to have been polluted. See Table IV. Air (100.00%), Water (89.00%), Land (99.73%) Scenery (99.20%) and Aesthetic Value (99.33%) have been polluted. The least polluted, Noise (35.47%), is not very significant because the noise of vehicles that dump wastes were the only commonest.

Discussions and Conclusion:

The Waste Dumps are massive with variety and multiplicity of items of solid and liquid wastes - degradable and non-degradable; and organic and non-organic. The degradable and decomposable wastes are always perpetually compounding the problems of pollution of the land, water, and air. Most of the inorganic ones will certainly and definitely continue to constitute bulk of the wastes. The situations will be getting worse by the day if no drastic actions are taken. Worse of all, there are inadequate logistics, and gross monumental infrastructural deficiencies in the waste management sector. The disadvantages of the wastes are by no means outwit the advantages. Malaria, Diarrhoea, Intestinal worms and upper respiratory tract infections are among the most common health problems reported in the clinics and hospitals around.

With immediate effect and without reservations, dumping of wastes at Ojota landfill has to stop. To start with, there must be flags/banners to warn and dissuade depositors of wastes at this dump. Members of the community and Lagosians and of course, the governments generally should adopt some of those World Environment Alphabets (80 Ways to celebrate Environmental Day). These include but not limited to:

-Government agents and individuals supporting and encouraging educational programmes, training, conferences, workshops, seminars, debate etc on environmental issues and waste management in particular;

-Governments, groups and individuals should graciously encourage, support and or sponsor competitions (banners, drawings, essays, paintings, posters, poetry) in support of Waste Management Logistics;

-All tiers of government, philanthropies, as groups and as individuals should be participatory and active in clean-up campaigns and environmental sanitation exercises;

- The metropolitan and State Governments should organize and sponsor awareness campaigns and jingles on radio, and television, and adverts and announcements in news papers, magazines, journals and books.

-There must be massive donation of blogs to World Environment Day (On June 5);

-There should be Award Competitions and presentations for various programmes and activities in support of environment and waste management;

-Banners and flags should be hoisted at major locations that should not be environmentally polluted;

-Alternatives should be indentified for the Ojota Waste Dump; and

-The Ojota Site should be beautified for recreation and more purposeful uses.

Further researchers and investments have to focus on the collection, transportation, processing, recycling or disposal of waste materials. There must be adequate infrastructure that will deal with the wastes. Ojota is just one of the several dumps of its type in the metropolis. There must be concerted efforts to handle wastes and waste management from homes, factories, cafeterias, eateries, hotels, brothels, market etc- to the dumps and at the dumps. Ojota is full. There should be an alternative site for dumping wastes. As much as possible, the potential choice of site must be out of built up residential or industrial area. Staged Approach may be adopted for its construction. It may be well over 15 kms away form the built up areas. While considering a new site, special attention must be given to the followings: Easy access to transportation to and

from the site; transfer stations; land value; costs of meeting government, community, and other requirements; community to be served; type of construction required; composition of the physical environment (nearby rivers, lakes, ponds, streams, flood plains, creeks and other bodies of water), soil type; potential capacity; and hazard management. Sorting, decomposing, composting, compressing, recycling and conservatism are imperative. The organic solid wastes could be sorted and processed as excellent manure and or further processed as fertilizer. Fertilizer manufacturing plants may be built near the Dump to make use of those enormous ''wastes'' that will be continuously generated and supplied on daily basis. Sorted and assembled inorganic contents can be similarly processed and recycled.

Each unit of livelihood should endeavour to have refuse/waste bin. The size will depend predominantly on the amount and type of waste generated per day. The waste bins should be well perforated/ ventilated but with lid to prevent breeding of flies and insects, and to prevent litter by vermin. The bins should be regularly emptied by Commissioned Agents, that is, for onward disposal at a well managed dump. The dump must be kept clean and cleared of hindrances to W.H.O standard of '' Clean Environment''.

Above all, it is high time Nigerians generally and Lagosians in particular are made to know "their rights" in respect of these, and keep their neighbourhood clean; recycle, reuse and rehabilitate degraded environment and work towards zero emission. It is imperative.

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