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Waste Management Practices in Urban Ibadan: A Critical Review

Yusuf, Olanrewaju, PhD

Abstract

The rapid urbanization of major cities in Nigeria has resulted in high waste generation from both domestic and industrial activities (NEST, 1991). This has contributed in no small measure to environmental degradation and a significant drop in environmental quality. Although various levels of government in Nigeria have institutions and agencies for waste management, nevertheless, the methods and manner of disposal and collection poses a challenge that seems to defy solution(s). Little attention has been given to waste management practices in urban Ibadan. This paper, therefore, carried out a critical review of waste management practices and its attendant effects on environmental quality in Ibadan, Oyo state. A case study research design was utilized. The paper, while being descriptive and analytic, made use of the primary and secondary sources of data collection. The primary sources included key informant interviews (KII) with 12 purposively selected stakeholders, government documents and gazettes. The secondary sources included published books, journals, newspaper and articles, unpublished works and internet resources related to the discourse. The paper concludes that Oyo State's reliance on landfills and incineration method for its waste management conversely decreases the quality of surface water and groundwater while exacerbating climate change. Increased environmental awareness drive and purposeful political will is key to achieving environmental quality in Oyo.

Keywords: urbanization, environmental quality, environmental degradation, waste generation and management

Introduction

Civilization has championed a modernised system of human day-today operations. This system has resulted in rapid population increase which is being experienced in most part of the world especially in urban centres such as Oyo State. Aliyu and Amadu (2017) note that the pace of urbanization in contemporary times is

unprecedented with cities such as Lagos having annual urban growth rate of 5.8%. According to Eduardo (2002), most traditional and urban cities of the world are trying to contend with the attendant problem of population increase. This is born out of the fact that increases in urban population mounts a corresponding pressure on the limited available resources deposited in the environment. One of the attendant effects of urbanization and urban development is the problem of providing enough facilities that will cater for the rising population. The more people migrate from rural to urban centres, the denser the residential area. The dramatic changes experienced at the level of development across the globe and the increase in urban population has invariably increased the consumption rates of the populace. Hence, the demand for resources has increased and, in some instances, far exceeds the supply (Yusuf, 2022).

The consumption pattern of man, which also has to do with day-to-day human lifestyle, results in the increased production of food as well as other necessities of life. Therefore, more food is produced and processed, more materials are manufactured and, more electrical appliances are produced to make life comfortable and worth living. In light of this, generating of waste becomes inevitable. The consumption patterns of man produced garbage, junk, dilapidated lands, papers, cans, water sachet/plastic, wood and human waste (Kumari & Raghubanshi, 2023). The continual production of home appliances, food, industrial chemicals, and industrial appliances has given rise to the generation of more waste in our environment. Thus, economic development, urbanisation, improved living standards in cities, and increase in enrolments of school children due to government policies in developing countries, increase the quantity and complexity of generated solid waste (Osinowo, 2001).

Waste management entails the collection, storage, transportation, treatment and disposal of waste in such a way as to render them innocuous to human and animal life, ecology and the environment generally (Fafioye and John-Dewole, 2013). Proper disposal of waste and collection of these refuse by the Waste Management Agencies helps in ensuring, not only environmental quality, but also environmental security. Volume of municipal waste in most parts of Nigeria continues to grow with the adoption of traditional landfill method, as well as stream or drainage system, as dumping ground (Atsegbua et al, 2003). Proper disposal of waste involves provision of space for resident to dump their refuse and effective management of the waste by designated waste management authorities. Wastes generated and not treated pose a great threat to the habitat and this can become hazardous to health and to other biological components of the natural and built environment.

Waste can be seen as items that people discard or throw away because it has hazardous properties and because it is of no value. There are different

categories of waste, for example; solid waste, animal by-product, electronic waste, food waste, agricultural waste to mention but a few. Wastes need to be disposed properly and transported effectively so as to prevent immediate dumping sites from serving as a breeding ground for bacteria and germs which will in turn degrade the environment. Suffice to say that a society that neglects the state of its environment, most especially with regards waste, is prone to environmental insecurity (Biswas, 2011) Problems ranging from air borne disease, outbreak of an epidemic, blockage of drainage system, flooding, increase in the numbers of scavengers, as well as shortage of life span will be obvious in an environment that neglects the essence of a purified and healthy environment (Hoornweg, Thomas & Otten, 1999)

Ibadan being one of the largest cities in Africa generates a lot of waste (Wahab, 2016 Although Oyo state has charted various courses in management of waste over the years, nevertheless mountain of waste generated and heaped on the street is increasing daily. This is due, in part, to the rapid increase in population consequently leading to an increase in waste generation as well as the opening of a huge waste disposal gap. Furthermore, the resources to effectively these waste management gaps are more or less limited. It is against this background that the paper critically reviewed waste management practices in urban Ibadan, Oyo state.

Human-Environment interaction

Man's life is unimaginable without the environment to cater for needs such as air (to breathe), water (to drink and wash with), food (to eat), and solid materials for creating weapons, building shelters and clothing (Atolagbe, 2002) Without the environment therefore, the survival of man is in question. Atolagbe, (2002) viewpoint puts the environment as integral for man's survival and refers to it as an "indispensable medium." Hence, a drop in environmental quality could pose a threat to human survival. The rapid urbanization of major cities in Nigeria has led to serious environmental degradation, with domestic and industrial wastes constituting major forms of environmental problem thereby threatening the safety of the environment. One of the environmental problems in Nigeria is the problem of proper waste management or disposal (World Bank, 1992). The increasing generation of waste can cause problems both to human health and the environment. In Nigeria, most traditional and urban cities are confronted with this "monster" (Onibokun, 1999). Nonetheless, non-provision of waste disposal facilities, lack of waste minimisation drive as well as the nonchalant attitude of people to waste disposal amounts to the dumping of refuses at illegal sites. This has contributed to waste encroachment on the roads, drainages and attendant traffic bottlenecks.

According to the Basel Convention, wastes are substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of international law (Basel Convention, 1989). The United Nations Statistics Division (U.N.S.D.) defines wastes as materials that are not prime products (that is products produced for the market) for which the generator has no further use in terms of his/her own purposes of production, transformation or consumption, and of which he/she wants to dispose (UNEP, 2005). Wastes can therefore be generated during the extraction of raw materials, the processing of raw materials into intermediate and final products, the consumption of final products, and other human activities.

Waste is defined to include refuse from households, non-hazardous solid waste from industrial, commercial and institutional establishments (including hospitals), market waste, yard waste, and street sweepings. Waste which is unwanted or undesired material left over after the completion of a process exist as a solid, liquid or gas. When released in its liquid or gas form, it is referred to as an emission. Identifying waste is a subjective matter due to the fact that waste is only defined as such when perceived as such hence, thus perception is key to identifying what represents waste and what doesn't. Scholars such as Edu (2006) see waste as a negative externality, however, it can also be viewed as potential resource through separation, composting, recycling and reusing methods.

Waste Management

Waste management refers to the collection, transfer, treatment, recycling, resources recovery and disposal of solid waste in urban areas. The goals of municipal solid waste management are to promote the quality of the urban environment, generate employment and income, and protect environmental health and support the efficiency and productivity of the economy (Edu, 2006). The collection and transporting of solid waste make the biggest demand on budgets of local councils and have the greatest impact on urban living (UNHABITAT, 2010). It is therefore clear that waste disposal practices are contributing to the deterioration of environmental quality (Onibokun, 1999). A well-defined and functional waste disposal practice would therefore be advantageous not only to the environment but also to man.

Since 1970, the boom in the city solid wastes can only have matched the boom in the oil sector in Nigeria (Edu, 2006), heaps of which tend to disfigure the its cities aesthetic while posing tremendous environmental health hazards to the citizens. The rapid urbanization of major cities in Nigeria has led to serious environmental degradation with domestic and industrial wastes constituting with significant major forms of environmental problem. To this end, various levels of government, manufacturing industries and organizations have developed various ways to manage and utilize wastes generated

particularly in the urban areas. According to Odumosu (2000), developed economies make use of three modes of residential refuse collection which includes the manual, semi-automated and fully automated methods. The manual collection vehicles are operated by a driver who loads and drives the vehicle; the semi-manual method involves a process where the driver operates a mechanical arm of the vehicle that is made to load a specially designed refuse cart into the body of the vehicle while the fully automatic method uses a compactor vehicle, which is a technologically advanced waste collection system designed to improve collection efficiency and performance. This is in contrast to two major waste collection methods practiced in developing economies which includes collection from neighbourhood deports and house-to-house collection (Olorunfemi, 2011). Various approaches and methods have been suggested and adopted for waste disposal and management and one of such methods include large scale incineration by use of incinerators (Oduola, 1986). This has been criticized for not being cost effective and poses environmental pollution problems, Oluwande and Owebokun (1986). Others include the following.

i. Recycling

Recycling is the commonest known way of managing waste in the developed countries and the developing countries equally struggling to manage their hazardous wastes. This is a way of producing a useful material from the waste products. Although, this will involve at least partly, more demanding and detailed targets for recycling and re-use. This recycling method has been divided into two sub-headings by the Environmental experts as;

i. The Waste to be reclaimed; and ii.
Wastes sorted out into various categories

The recycling process includes three steps: collecting and processing, manufacturing, and buying recycled products. Collecting recyclables varies from community to community, but there are four primary methods: curbside, dropoff centres, buy-back centres, and deposit/refund programs. The key to recycling is the individual due to the fact that recycling is a choice. Once cleaned and separated, the recyclables are ready to undergo the second part of the recycling loop. More and more of today's products are being manufactured with total or partially recycled content. Common household items that contain recycled materials include newspapers and paper towels, aluminium, plastic, and glass soft drink containers, steel cans, and plastic laundry detergent bottles. Recycled materials also are used in innovative applications such as recovered glass in roadway asphalt (glassphalt) or recovered plastic in carpeting, park benches, and pedestrian bridges (Kuitunen, 2005). Purchasing recycled products completes the recycling loop. Through "buying recycled," governments, businesses and individual consumers each play an important

role in making the recycling process a success. As consumers demand more environmentally sound products, manufacturers will continue to meet that demand by producing high-quality recycled products. **ii. Landfill**

Landfill is not known to most parts of the nations of the world. It is the most common method of waste management and countries such as Nigeria, US, India and UK are not exempted from the application of this method. It requires digging of a hole on the ground, and filling it with hazardous rubbish and where there is existing deep ground; waste can be used to fill it. Section 35 of Environmental Protection Act of United Kingdom authorizes the waste managers to licence the companies who specializes in landfill and ensure that the landfill is not done in such a way to injure the neighbours in the area. To ensure compliance, the Act empowered the officers to visit the scene of their landfill and if the land fillers were not effective in their activities; the licence can be withdrawn or outrightly revoked. In Nigeria, there are landfills in most of the states, managed by local councils, though subject to various rules of maintaining standards provided by the NESREA on proper management of landfills (NESREA, 2007).

The main health concern with human and animal wastes is the high concentrations of pathogenic organisms associated with this type of waste, and the potential it has to spread disease. According to the most recent global statistics, the death rate from all causes is 9 per 1000 of the population (PRB, 2014) In many regions, burials are concentrated into relatively small areas, such as municipal cemeteries, where each body introduces a heavy burden of organic, inorganic and biological parameters into the subsurface. Hydrogeological factors have historically not been taken into account when locating cemeteries and the potential impact of cemeteries on groundwater quality has not been considered (Fetter, 2001). Animal and human remains, although not considered a "waste product', represent a risk to the quality of local groundwater because of the proliferation of microorganisms that occurs during the process of corpse decomposition (Pacheco, Childers, Arnold, Casiano & Ward 1991) Most pathogens will remain viable for a period of time after the host dies; the length of time depending on the pathogen.

A major effect of landfills is Leachate, a contaminated liquid that percolates through the waste in a landfill and probably the most addressed issue. This contaminated liquid can soak into the ground and cause water contamination according to the Department of Agriculture and Life Sciences at North Carolina State University. Another effect of landfills is air pollution. Not only can air pollution from landfills contribute to acid rain and greenhouse gases but, it can also have an impact on the citizens living around it. Soil gas migration can cause a four-fold elevation of risk for bladder cancer and leukaemia among women (New York Health Department, 2016).

iii. Incineration

This type of disposal releases many air pollutants to include admium, lead, mercury, dioxin, sulphur dioxide, hydrogen chloride, nitrogen dioxide, and particulate matter according to the UK Environmental Protection Agency. Gases such as sulphur dioxide and nitrogen dioxide contribute to acid rain and smog. The incinerators mainly contribute to air pollution but the ash left over from burning waste has to be buried in landfills thus contributing to ground pollution too. Incineration is the process of destroying waste material by burning it. Incineration is carried out both on a small scale by individuals and on a large scale by industry. It is recognized as a practical method of disposing of hazardous waste materials, such as biological medical waste. Though still widely used in many areas, especially developing countries, incineration as a waste management tool is becoming controversial for many reasons. Incineration is a poor use of many waste materials because it destroys not only the raw material, but also all of the energy, water, and other natural resources used to produce it. Some energy can be reclaimed as electricity by using the combustion to create steam to drive an electrical generator, but even the best incinerator can only recover a fraction of the caloric value of fuel materials.

Also, incineration creates toxic gas and ash, which can harm local populations and pollute groundwater. Modern, well-run incinerators take elaborate measures to reduce the number of toxic products released in exhaust gas, but concern has increased in recent years about the levels of dioxins that are released when burning mixed waste (Merrill, 2005). This controversy stems from the conflict between short- term concerns and long-term ones, in this case between burning the wastes now for convenience or passing on possible environmental consequences to future generations.

iv. Other waste utilisation processes

A fourth concern is an anticipated shift from landfill, incineration and recycling and towards alternative forms of disposal. It is intended that the proportion of industrial waste going to landfill should be reduced to a reasonable percentage and converted to electricity. Ineffective management of municipal waste leads to pollution of water, ground water, and air which is from inefficient burning of wastes, either in open air, or in plants that lack effective treatment facilities from the gaseous effluents (The Ministry of Urban Development, Government of India, 2012).

Ugwunwa (2005) observes that poor solid-waste management has resulted in ever- increasing heap of solid-waste often found on the streets and major roads, which have become a common feature of Nigeria's urban landscape. Oyediran (1997) notes that the visible feature of most urban centres in Nigeria is the refuse "mountains' which emit foul odours, as well as a breeding ground for pathogenic agents. Ogbalu (2003) observes that a number of health hazards in Nigeria such as dysentery, typhoid, cholera, etc have been associated with

poor solid waste management in Nigeria cities. Ubani (2003) notes that in almost cities and rural areas in Nigeria, the menace of solid waste have posed great environmental problems due to the inability of the solid waste management agencies to carry out their responsibility. This is evidenced by the indiscriminate disposal of refuse on the streets, drainages and water bodies in most Nigeria cities. He observes that despite the government involvement in solid waste management, there has been no remarkable improvement.

Eze and Asadu (2003) posit that one of the most pervasive problems of contemporary cities in all regions of the world, especially the developing countries is solid waste management problem accentuated by the process of urbanization and urban development. Chukwu (2002) notes that many cities in the country today, are suffering from sudden increase in solid wastes and their poor disposal. She observes that the volume of wastes resulting from plastic materials being littered in the streets, open spaces and public premises are becoming alarming. "These wastes are often discarded without due regard to environmental sanitation" (Agbogu, 1991)

Adesanya (1986) notes that poor evacuation of central refuse dump is a major factor influencing high volumes of solid waste in Nigerian cities. Buckets and Smith (1984) enumerate the consequences of indiscriminate disposal of solid waste. According to them, uncollected wastes often end up in drains, causing blockages which result in flooding and unsanitary conditions. Ugwunwa (2005) identifies the causes of indiscriminate disposal of solid waste as carefree attitude, lack of environmental awareness, absence of disposal site and population explosion. According to him, the consequences of indiscriminate waste disposal would be health hazards, poor environmental quality, pollution, and low scenic value of neighbourhoods. Thus, indiscriminate waste disposal will in the long run affect environmental quality.

Methodology

The paper employed primary and secondary sources of data collection. Nonparticipant observation and key informant interviews (KIIs) served as the primary sources. The KII respondents were purposively selected as representatives of the people in the selected areas. A total of 8 KIIs were conducted on the landlord association chairmen in four different local government areas. Thus, two KII were conducted in each of the four Local Government Area. Eleven local government areas in the metropolis were identified however, four specific local governments were sampled which includes Ido, Ibadan Southwest, Ibadan southeast, and Akinyele LGAs. The choice of the LGAs was based on the volume of waste generated in each of the 11 LGAs. This was reinforced by Oyo State Government gazettes and documents. Additionally, four KIIs, one environmental health officer (EHO) from each of the selected LGAs, were sampled. Furthermore, dumpsites and

dump-heaps in the selected LGAs were visited using the non-participant observation method. Relevant literatures served as the secondary data

Waste Management in Urban Ibadan

The present site of Ibadan was established by Lagelu after the destruction of the first settlement near Awotan in the neighbourhood of Apete in Ido Local Government area. The presence of hills makes the site of the city easily defensible while its location close to the boundary between forest and grassland makes it a melting point for people and products of the forests as well as those of the grassland areas (Tomori, 2006). However, Ibadan was resettled in 1820 as a camp by the soldiers of the Ife, Ijebu and Oyo after they had successfully overcome the neighbouring kingdom of Owu. The city of Ibadan is located approximately on longitude 3°5' east of Greenwich Meridian and latitude 7°23' North of the Equator at a distance some 145kilometres worth east of Lagos. Ibadan is directly connected to many towns in Nigeria, as its rural hinterland by a system of roads, railways and air routes. The physical setting of the city consists of ridges of hills that run approximately in northwest-southeast direction. The largest of these ridges lies in the central part of the city and contains such peaks as Mapo, Mokola and Aremo. These hills range in elevation from 160 to 275 metres above sea level.

From a war camp consisting in 1829 of a motley collection of soldiers, the population rose from the estimated 100,000 in 1851 to 175,000 in 1911 to 1,829.300 in 1999 at a growth rate of 1.65% from 1963 and increased to 1,338,659 in 2006 at a growth rate of 2.35% (Tomori, 2006). As at 2009, the population of the state was estimated at 2.4 million (NPC, 2009). According to Ayeni (1994), the population of Ibadan has continuously been on the increase and these low rates of growth are due to implementations and inaccuracies of census estimates.

Population Growth of Ibadan (1851 – 2006)

Year	Ibadan Urban	Rate of growth	Ibadan less city	Rate of growth (%)	Total population	Rate of growth (%)
1851	100,000	-	-	-	-	-
1890	120,000	0.5	-	-	-	-
1911	175,000	2.2	-	-	-	-
1921	238,075	3.6	-	-	-	-
1931	387,133	5.0	-	-	-	-
1952	459,196	0.8	286,252	-	745,448	-
1963	627,379	2.8	514,298	5.7	1,141,677	3.95

1991	1,222,663	2.43	606,639	0.5	1,829,300	1.65
2006	1,338,659	0.57	1,211,934	4.7	2,550,593	2.35

*Source: *1831 and 1890 figures were estimated by Missionaries. *Census figures 1952, 1963, 1991 and 2006; *Federal Office of Statistics; *Ibadan Region edited by M. O. Filani (1994)*

Consequently, the Ibadan metropolis ever-increasing population and inadequate drainage system gave rise to the problem of refuse disposal (Tomori, 2006). This has resulted in blocking of the few existing drainagem consequent upon which Ibadan's major river, Kudeti and river Ogunpa, and other smaller ones such as Ogbere stream, Orogun stream and Labelabe stream had to overflow their banks. According to Wahab (2016), refuse generation had grown astronomical above the management capacity of the state. The ability of the government to therefore provide for convenient, and reliable urban service such as waste management, is constrained by the demands of other fundamental needs such as food, clothing, basic shelter and security. Waste management therefore happens to be on the lower cadre of priority for governments. In such circumstance, Dillinger (1993) suggests that citizens would commonly resort to more expensive alternative sources or choose to litter the environment without recourse to possible consequences.
Waste management was initially under the purview of the Ibadan city council in the early 60's but as at today, the Oyo Solid Waste Management Authority is saddled with the responsibility of managing waste.

Development and growth also mean advancement in technology. Such advancement/development leaves behind unchecked waste. This was reiterated by Kemp-Bendict (2003) when he stated that the success of development often leads to adverse consequences which will in turn affects the economy. This adverse effect is in loss of biodiversity and proliferation of waste. In the 70's, Waste in Ibadan comprised mainly leaves, paper, food waste, tins, glass, and rags (Yusuf, 2019). However, the rapid urbanisation of the Ibadan metropolis saw the siting of small- and large-scale industries in the city. Such industries are spread round the 11 local governments of the metropolis. Rapid urbanisation has therefore led to increase in human population, increase in industries and a corresponding increase in waste. Although increasing growth enhances the productivity of the economy and enables it access more advanced levels of technological knowledge (Alege and Ogundipe, 2013), inability to advance knowledge base and evolve management strategies would defeat the advantages.

Unarguably, one of the main problems facing Ibadan City and which has become an intractable nuisance is open and indiscriminate dumping of refuse, human and animal faeces (Adeolu, Enesi and Adeolu, 2014). Although it is generally reported that enormous quantities of solid waste are generated in

Ibadan daily, the exact figures are difficult to determine (Yusuf, 2019). Piles of decaying garbage which are substantially domestic in nature, and in some instances industrial, dominate strategic locations in the heart of the city. The wastes become sources of air and water pollution, land contamination, health hazards and environmental degradation (Omoleke, 2004). According to Oke et al. (2013), the city's human excreta are disposed of largely by means of septic tanks, pit latrines, and bucket; in some cases, it is wrapped with nylon and thrown into the gutter or stream. The uncontrolled disposal of liquid and solid waste into open gutters, open spaces, and along roads poses serious environmental and health hazards. Consequently, deterioration of public health can exert excessive pressure on the health budget, curtails productivity and worsen urban condition of health.

A critical look at the waste management practices in Bodija area of Ibadan revealed that the government waste management intervention has shaped the waste disposal practices of the citizens in the area. The intervention, in the shape of Public-Private Partnership (PPP), involved collaboration between the Oyo State Solid Waste Management Authority (OYOWMA) and Private disposal companies. Notably, PPP was introduced in 2008 in Oyo state as a way to curb indiscriminate disposal of refuse in the State. Despite the frequency of waste evacuation by the PPP arrangement in Bodija, the landlord associations came out with a policy that was reinforced in 2005, which banned in totality the burning of waste, bush or otherwise. Thus, incineration is totally frowned at in the areas. Similarly, a system of keeping refuse cans per building is encouraged. A respondent noted that the landlord associations in the axis set-up a monitoring committee as far back as 2010 to ensure compliance to environmental decisions of the communities. This he noted, is to ensure a friendly environment. However, of the various houses sampled in the axis at two different instances, delay in picking refuse by the waste management agencies resulted in noticeable stench from the refuse bins and slight spill-over in another instance.

A survey of Barracks-Arulogun area of Akinyele LGA of the metropolis as well as Apete-Awotan area of Ido LGA revealed that refuse is openly incinerated at all time of the day by residents. Furthermore, refuse is dumped indiscriminately on the road, in the gutter and at bush parts. Of the two instances the researcher visited these areas, no noticeable refuse can is sighted and no waste management authority or "Public Private partnership" (PPP) truck had visited the area for refuse pick-up. The respondents noted that the PPP trucks visit the area once in two months which has pushed residents to dispose waste indiscriminately. Furthermore, a respondent noted that people go as far as dumping refuse at the Ojoo express late at night and early in the morning. He blamed the actions on lack of sustainable waste disposal method

in the area and on the attitude of residents towards payment for waste disposal which has made PPP trucks blacklist the area.

In the same vein, the Apata of the Ibadan metropolis axis also revealed similar situation as the Apete/Awotan axis however, waste management authority through "public private partnership" (PPP) truck had visited the area once of the two times the researcher visited. Respondents decried the money demanded from them by the private waste management operators. One of the respondents noted that the PPP trucks complained about the state of the link road from Apata junction to "Bembo" and beyond as the reason for their occasional visit to the area. The Oluyole/Mobil/Challenge axis of the Ibadan South West Local Government has a fairly effective waste management system. According to the landlord association chairman, the PPP trucks collect refuse three times in a month and enforce sanitation standards on industries around the axis hence industrial waste is effectively managed. The solid and liquid waste in the area is also evacuated through PPP as at when due although, residents complained of high cost of evacuation. Furthermore, the area, as earlier noted, has a large concentration of factories and, industrial waste are visible in the drainages. This negates the earlier stance by a respondent who posited that industrial waste are effectively managed by OYOWMA.

The public-private partnership was instituted to solve the waste management challenges of the State. The Ibadan metropolis had hitherto been referred to by many as the dirtiest city in Nigeria prior to the establishment of the integrated waste management approach. Data from the field indicates that the "dirtiest city" toga had subsequently been done away with by the State however, citizens still dump waste indiscriminately. Public places are not left out and the waste keep piling up despite efforts aimed and evacuating household and industrial waste. The major markets in the selected study area are littered with refuse. The public relations officer of the Alesinloye market fabric sellers noted that the market users handle waste efficiently. She blamed the refuse pile up on strangers who dump the refuse after the close of business. One of the respondents agreed with the stance of the PRO however, it was posited that the attitude of people towards waste disposal is condemnable. The respondent noted that waste is often dumped in drainages, on the express and most times, in the gutter. A visit to the Ajankaja, Awotan and AbaEku dumpsites shows that the State employs the landfill and incineration method for waste management in the State. Scavengers, who are mostly unregulated, sort the waste for useful materials for onward sale to companies and individuals for recycling purposes.

Scavengers at Aba-Eku, Ibadan. Aromolaran et al, 2019

Conclusion and Recommendation

Global best practices in waste management focuses on four major which includes minimization (stabilization or reduction of the production of wastes), maximizing environmentally sound waste re-use and recycling processes, promoting environmentally sound waste disposal treatment and extending waste service coverage. Although the Oyo State government aligns with these, the level of alignment is low. The state focuses more on widening of service coverage and maximising of waste collection and disposal. Wastes are therefore collected from various sources and transported by collection vehicles directly to the dump sites and the local agencies do not have adequate capacity and resources to handle the amount of waste being generated.

The Ibadan metropolis has three landfills and dumpsites. Though meant to be a sanitary landfill, Aba-Eku (on Akanra Road) has been turned to a mere dump site which has brought about leachate flow on the ground surface and directly into Omi stream. The site is used as a dumpsite for both non-infectious municipal wastes and hazardous components and the technical specifications expected in a standard landfill are lacking (Coker et al, 2009). Another dumpsite is situated at Awotan on Akufo Road. Similarly, the Oyo State government also has a site at Ajakanga, Odo-Ona Elewe site which currently runs a mini waste-to-energy project. The site is even less managed than the one at Aba-Eku. It's a huge dumpsite opposite residential buildings in a huge community. Hence, a technical stratification and overhaul of the dumpsite would be advantageous to the city. The state therefore employs landfills and

incineration method for its waste management. Although private waste recycling plants exist, groundwater environment is being assaulted with an ever-increasing number of soluble chemicals. The heavy reliance on land application as a means of municipal waste disposal has generated concern in recent years on the effect of landfills and waste dumpsites on the quality of surface water and groundwater. Suffice to say, therefore, that waste is still largely disposed without effective safety and control measures in Oyo state. Consequently, much of the emphasis in groundwater investigation has shifted from problems of its supply to consideration of groundwater quality. Furthermore, the burning of refuse indiscriminately by residence contributes to global warming and exacerbates climate change. Suffice to say that one of the effects of climate change on human population is decrease in environmental quality. The essence of waste management is to maintain acceptable environmental quality, sound public health and creation of aesthetic value. Hence, strengthening public waste management agency through beefing up the personnel strength of the agency and improving the circulation infrastructure and logistics cannot be over emphasized. These will enable the agency to operate at a high level of efficiency.

Apart from the waste management which is one of the key roles of the State Government, the people (Citizens) also have a role to play. Attitude of waste generators to waste disposal can either make evacuation and disposal of waste easy or hard. Hence, public education on waste management is highly necessary. There is a lacuna with regards proper orientation and training on how to keep the environment clean as well as how best to dispose waste in order to prevent diseases and other health hazards that could result from poor environmental management in Ibadan. It is therefore suggested that the waste management agency, Oyo State Solid Waste Management Authority (OYOWMA), should dedicate resources to educating the ever-increasing populace of waste disposal. This is key noting the fact that waste not properly disposed could later be a catalyst to environmental hazards like flooding, disease breakout and aesthetic deterioration.

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