

## **CHALLENGES OF SOLID WASTE MANAGEMENT: AN IMPEDIMENT TO EFFECTIVE SOLID WASTE MANAGEMENT IN LAGOS METROPOLIS**

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### **ABSTRACT**

*Solid waste management authority seems to be incapacitated to maintain healthy and hazard free environment due to some itching problems. This study, therefore, analysed challenges being faced by Lagos State Waste Management Authority (LAWMA) in generation, collection, transportation and disposal of solid waste in Lagos Metropolis Nigeria. Data were obtained from both primary and secondary sources. This study concluded that non-availability of land for waste disposal (79.3% ), lackadaisical attitude on the side of Lagos residents (76.5%), Poor electricity supply to power various components of technology-driven assignments(73.8%), non-compliance with environmental rules and regulations, (83.8%), inadequate funding (64.2%), inadequate technological advancements in the execution of various methods of solid waste management (80.5%), as well as improper planning (70%) were the identified challenges facing LAWMA in the maintenance of healthy environment within the study area.*

**Keywords:** *Solid Waste, Management, Environmental Sanitation, Environmental Hazard*

### **1. Introduction**

One of the major problems confronting Lagos State is incessant migration from other part of the country. This daily influx has a relative impact on the population size of the state because of excessive industrialized nature of the state. Lagos state with an estimated population of 20 million, ranked as the most densely populated city in Nigeria because of its commercial activities, it is ostensive to say that the quantity of solid wastes generated in the state is in proportion with the population size. Consequently, (Omuta 1988) assert that, the higher the population of cities like Lagos, Ibadan, Onitsha, Port Harcourt, Kaduna, Kano, Sokoto etc

increases, the wastes generation capacities of these cities enormously increases, while the competence of the Highway Managers to regularly and effectively manage the collection and disposal of solid wastes deteriorates.

USAID (2009) asserts that, in the recent time, the attention given to solid waste management in developing countries is growing, but still regarded as incipient. In some African countries, it is un-proportional to population growth and inadequate to the industrial development, but in most African nation (especially the urban areas) it is absolutely relative to population growth as well as industrial development. Thousands of tons of solid waste are generated daily in Africa. Most of it ends up in open dumps and wetlands, contaminating surface and ground water and posing major health hazards. USAID (2009), posit that generation rates available only for select cities and regions are approximately 0.5 kilograms per person per day in some cases reaching as high as 0.8 kilograms per person per day. While this may seem modest compared to the 1-2 kg per person per day generated in developed countries, most waste in Africa is not collected and disposed of by municipal collection systems because of poor management, fiscal irresponsibility or malfeasance, equipment failure, or inadequate waste management budgets (USAID, 2009).

In developing countries, the challenges faced by government and its' agency in solid waste management has led to the poor management of solid wastes in the metropolitan cities and thereby caused several diseases affecting the quality of life of people. It is therefore pertinent to note that UNEP (2005) ones advised that unless more effective urban wastes management programs and public water supply systems are put in place, outbreaks of cholera, typhoid and plague may become increasingly common in developing nations. The current cases of Ebola and Lassa fever, typhoid fever, cholera e.t.c is as a result of poor management of environmental sanitation.

In addition to improper management of solid waste, Awe (2006), in his write up titled "Improper environmental management increases avoidable death", published by the *Punch Newspaper*, he submitted that, WHO reported that out of over 10 million deaths that occur in Africa annually, a total of about 2.4 million have been attributed to environmental cause, which is avoidable. Also, in the report entitled, "Preventing through healthy environment", WHO noted that nearly one

quarter of all deaths globally can be attributed to lack of proper management of the environment (WHO, 2006).

## **2. Review of Relevant Literature**

### **2.1 Wastes**

Wastes can be defined from different perspectives. Its definition depends on the perception of whoever is defining it. Normally wastes can be described as something that has no value, useless and that want to be discarded by the owner. Concise oxford Dictionary defined wastes as lack of use or ‘useless remain’. Moreover, the New Encyclopedia Britannica defined ‘wastes’ as “material that is discarded because it has served its purpose or is no longer useful”. From the above definitions, we can deduce that waste is discarded once it has served its purpose. Also that an object becomes a waste when it is no longer useful, or it has become wear and tear, which means it is valueless. Medina (2008), observed wastes from economic point of view to him, waste is anything that has no financial values either at present or the future because there is no demand for such item in the marketplace.

Oreyomi (2005) simply put wastes as any unwanted or discarded materials at a particular place and time arising from normal community activities. Once a substances or object has become wastes, it will remain wastes until it has been fully recovered and no longer poses a potential threat to environmental health. The UK Environmental Protection Act 1990, indicated that wastes include any substances which constitute a scrap materials, an effluent or other unwanted surplus arising from the application of any process or any substance or article which requires being disposed of which has been broken, worn out, contaminated or otherwise spoiled, this is supplemented with anything which is discarded, otherwise dealt with as if it was wastes, shall be presumed to be wastes unless the contrary is proved.

### **2.2 Solid Waste**

The American Public Liquid Association in 1975 defined solid waste as an unwanted and useless material with insufficient liquid content to be free flowing, because of its sticky nature, solid waste has the ability to accumulating and physically insulting and degrading the environment if not well managed. These wastes are more conspicuous in the urban than rural areas and have

been linked to such problems like demographic inconsistency and in continuity in sanitation policy and data availability. Solid waste can be classified in a number of ways, on the basis of resources, environmental risks, utility and physical property. On the basis of source, solid wastes are again classified as Municipal Solid Waste, Industrial Solid Waste and Agricultural Solid Waste.

Williams (2005) observed that waste is very subjective; one person may deem an item to be waste whilst another might see it as a resource. The way solid waste is managed for different types of sectors is important as the nature of each industry or sector varies. The dynamic nature of consumer/end user products, packaging materials, environmental regulations and public attitudes has made the development of solid waste management strategies an increasingly complex task (Sakai; et al,1996). The unhealthy disposal of solid waste is one of the greatest challenges facing developing countries (Kofoworola, 2007). Rosenbaum (1974) argued that solid waste is an unofficial measure of prosperity since wealthy nations produce more wastes than poor ones but Omuta (1988) argued that, what causes wastes problem is not volume produced but the degree of effectiveness of solid waste management.

Solid waste management, therefore, is the process of collecting, storing, treatment and disposal of solid wastes in such a way that they are harmless to humans, plants, animals, the ecology and the environment in general. Solid wastes comprise all the wastes arising from human and animal activities that are normally solid, discarded as useless or unwanted. Also included are by-products of process lines or materials that may be required by law to be disposed of (Okecha 2000).

### **2.3 Solid Waste Management**

Solid Waste management could be described as the appropriate method and strategies for generation, storage, collection, and disposing of solid waste in the most appropriate manner, so as to reduce or eliminate its harmful effect. This involves appropriate disposal of sewage, industrial and household refuse. Rodgers (2011) contends that waste management is a systematic control of generation, storage, collection, transportation, separation, processing, recovery and disposal of solid waste. In the smallest of places, solid waste management is accepted as a major

aspect of the indigenous community organization and traditional home management; hence every house/compound has a designed area for solid waste collection disposal and or incineration (Sanda, 2008). In Nigeria, wastes are generated in homes, commercial centres, industrial sites, hospitals, schools, on streets and even religious activities.

Furtherance to the conceptualization of solid waste management, Oreyomi (2005) described solid waste management as the collection, storage, transportation, treatment and disposal of waste in such a way as to render them innocuous to human, animal life, ecosystem and the environment generally.

Varied literature disclosed that management of solid waste is a problem recognized by all nations at the 1992 Conference on Environment and Development, and regarded as a major barrier in the path towards sustainability (UNCED, 1992). Consequently, Omoleke (2005) assert that in Nigeria, state government is assigned with responsibility for the protection of the environment, for efficient management of waste and to make appropriate laws for environmental sanitation. This in accordance with section 20 of the Nigerian 1999 constitution, that “the state shall protect and improve the environment and safeguard the water, air and land, forest and wild life of Nigeria”. Also, the same 1999 constitution specifically assigns local government with the statutory responsibility of environmental sanitation as the third tier of government in Nigeria.

In another perspective, Omoleke (2005) asserted further that the above mentioned constitutional provision informed the Federal Military Government to promulgate decree No. 58 of 1988, which consequently charged the Federal Environmental Protection Agency with the responsibility of maintaining decent environments in Nigerian cities and towns. The decree made provisions for the post of a chairperson who is knowledgeable in environmental matters, four distinguished scientists, and one representative of the Federal Ministries of Health, Science and Technology, Works and Housing, Agriculture, Water Resources and Rural Development, Industries, Mines Power and Steel Employment Labour and Productivity Petroleum Resources, Transport and Aviation (Federal Military Government 1988).

Section 4 of the decree charged the agency with the protection and development of the environment in general and environmental research and technology. The decree spelt out that, it shall be the duty of the agency to:

- advise the Federal Military Government on national environmental policies and priorities and on scientific and technological activities affecting the environment
- prepare periodic master plans for the development of environmental sciences and technology and advise the Federal Military Government on the financial requirements for the implementation of such plans
- promote co-operation in environmental science and technology with similar bodies in other countries and with international bodies connected with the protection of the environment
- co-operate with Federal and State Ministries, Local Government Councils, Statutory bodies and research agencies on matters and facilities relating to environmental protection
- carry out such other activities as are necessary or expedient for the full discharge of the functions of the Agency under the decree.

Section 5 of the decree empowers the agency to;

- make grants to suitable authorities and bodies with similar functions for demonstration and for such other purposes as may be determined appropriate to further the purposes and provisions of the decree collect and make available, through publications and other appropriate means and in co-operation with public or private organisations, basic scientific data and other information pertaining to pollution and environmental protection matters.
- enter into contracts with public or private organisations and individuals for the purpose of executing and fulfilling its functions and responsibilities pursuant to this decree.
- establish, encourage and promote training programmes for its staff and other appropriate individuals from public or private organizations.

- enter into agreements with public or private organisations and individuals to develop, utilise, coordinate and share environmental monitoring programmes, research effects, basic data on chemical, physical and biological effects of various activities on the environment and other environmentally related activities as appropriate.
- establish advisory bodies composed of administrative, technical or other experts in such environmental areas as the agency may consider useful and appropriate to assist it in carrying out the purposes and provision of this decree.
- establish such environmental criteria, guidelines, specifications or standards for the protection of the nation's air and inter-state waters as may be necessary to protect the health and welfare of the population from environmental degradation.
- establish such procedures for industrial or agricultural activities in order to minimize damage to the environment from such activities.
- maintain a program of the technical assistance to bodies (public or private) concerning implementation of environmental criteria, guidelines, regulations and standard and monitoring enforcement of the regulations and standard thereof and develop and promote such processes, methods, devices and materials as may be useful or incidental in carrying out the purpose and provisions of this decree.

In relation with the literature on solid wastes management, a number of concepts and regulations are mentioned as to systematize the steps of handling solid wastes from the moment a good is turned into wastes at the source of generation until its final disposal. Solid waste management, therefore, is the process of collecting, storing, treatment and disposal of solid wastes in such a way that they are harmless to humans, plants, animals, the ecology and the environment generally. Solid wastes comprise all the wastes arising from human and animal activities that are normally solid, discarded as useless or unwanted. Also included are by-products of process lines or materials that may be required by law to be disposed of (Okecha 2000).

#### **2.4 Environmental Hazard of Wastes**

The pollution of both solid and liquid waste, the decomposition of this mismanaged waste into constituent chemicals is a common source of environmental pollution leading to environment

health hazard. It is more critical in developing nations than the developed one; lack of proper waste management system, lack of standardized landfills in Nigeria and mostly in the developing nation leads to an environmental health hazard. The industrialized state like Lagos and other populated states are facing challenges of environmental health hazard emanated from improper waste management. The challenges are again associated with the astronomical increase in population and rapid urbanization of these industrialized states. The major environmental concern in Nigeria, especially in Lagos state is solid waste, liquid materials released by industries as well as gas release by decomposing garbage. Drainages and canal blockage is a by-product of improper solid waste management, also, Methane is a by-product of the anaerobic respiration of bacteria, and these bacteria thrive in landfills with high amounts of moisture, improper management of all these thereby posed hazard into the environment. Hardoy J. E, D. Mitlin, D. Satterthwaite, (2001) posited that Methane concentrations can reach up to 50% of the composition of landfill gas at maximum anaerobic decomposition which could lead to water pollution and thereby constitute environmental health hazard to both human and animal. Gaseous pollution also contributes to the so-called greenhouse gasses (GHGs) which are blamed for global warming, both gases are major constituents of the world's problem GHGs; however, while carbon dioxide is readily absorbed for use in photosynthesis (FEPA 2003).

### **3. Study Area**

Based on primary data collection, the study specifically covers Lagos State. The justification for choosing Lagos state is because the first waste management outfit in West Africa was established in the state, which generalization is made for the purposive selection of five existing geographical division of Lagos state. This includes; Badagry, Epe, Ikeja, Ikorodu and Lagos Island respectively. The purpose of this selection is to cover the entire Lagos state.

The study population is 1,060, consists 372 staff of Lagos State Waste Management Authority (LAWMA) in the zones within the existing five geographical areas; 337 Private Sector Participants; 54 Highway Managers and 185 evacuator (waste handlers). The choice of these respondents is based on their direct operational involvement in the generation, collection and disposal of solid waste in Lagos state. Also included in the population are 32 executive members of Community Based Organisations, 26 members of Market Women Association and 54

members of Road Transport Workers, representing the beneficiaries of solid management scheme within the five selected areas. Simple random sampling technique was also used to select 20% respondents from the total population of 1,060 out of which 212 were selected as the sample size of the study.

**Table 1:Distribution and Retrieval of Questionnaire**

S/N	Study Areas	Targeted Respondents	Number of Questionnaires Administered	Number of Questionnaires Retrieved
<b>1.</b>	<b>Badagry</b>	LAWMA staff	14	11
		Private Sector Participants	13	12
		Highway managers	2	2
		Evacuators	7	6
		Community Base Organisations	2	2
		Market women association	2	2
		Road transport workers	2	2
<b>2.</b>	<b>Epe</b>	LAWMA staff	14	12
		Private Sector Participants	13	9
		Highway managers	2	2
		Evacuators	7	5
		Community Base Organisations	2	2
		Market women association	2	2
		Road transport workers	2	2
<b>3.</b>	<b>Ikeja</b>	LAWMA staff	14	13
		Private Sector Participants	13	10
		Highway managers	2	2
		Evacuators	7	7
		Community Base Organisations	2	2
		Market women association	2	2
		Road transport workers	2	2
<b>4.</b>	<b>Ikorodu</b>	LAWMA staff	14	9
		Private Sector Participants	13	10
		Highway managers	2	2
		Evacuators	7	6
		Community Base Organisations	2	2
		Market women association	3	3
		Road transport workers	2	2
<b>5.</b>	<b>Lagos Island</b>	LAWMA staff	14	11
		Private Sector Participants	13	10
		Highway managers	2	2
		Evacuators	7	6
		Community Base Organisations	2	2
		Market women association	3	3
		Road transport workers	2	2
<b>TOTAL</b>			<b>212</b>	<b>179</b>

*Source: Field Work (2015)*

#### **4. Methods and Instruments**

This study utilised both primary and secondary source of data collection. The primary data were sourced through the administration of questionnaire and conduct of in-depth interviews. The questionnaire was administered to elicit information from respondents with the application of simple random sampling technique. Two hundred and twelve (212) copies of questionnaire were distributed to all the categories involved in the administration of solid waste in Lagos State. To complement the information from questionnaire, a total of sixteen (16) respondents were purposively selected for an interview. With respect to the in-depth interview, all the respondents were asked the same set of questions. This is to enable the comparison of answers provided. Secondary data were sourced from relevant textbooks, academic journals, internet facilities, magazines and official documents of LAWMA.

The questionnaire consisted of open and closed ended questions. It has two [2] sections: the first section presented questions on socio-demographic characteristics of respondents; and the second section consisted assertions that enable the analysis of challenges confronting LAWMA in the delivery of environmental development programmes and thereby serve as impediments for solid waste management in the state, within the period under study.

On the other hand, interview guide comprised questions that are capable of generating qualitative data on the challenges confronting LAWMA within the period under study. In addition, secondary data was also employed to complement the information obtained through the primary data. This helped to obtain qualitative data from the past work done on the research topic. The data collected from both primary and secondary were analyzed using descriptive statistics such as tables, frequency distribution, percentages and simple mean.

#### **5. Discussion of Findings**

This section provided data analysis on the challenges facing waste management authority in the discharge of their functions and responsibilities in the Lagos state. This study itemized some challenges which the respondents were asked to agree or disagree on the basis of their own observations. The Table 2 revealed the frequency and percentage distribution of the respondents as well as a mean value on each of the itemized challenges facing the waste management authority in the state.

As shown in Table 2, 142 representing 79.3% of the respondents agreed that there is non-availability of land for waste disposal which constitutes one of the major challenges of the waste management authority in Lagos state. As a result, waste could not be easily disposed and decomposed in the state. This finding is self-evident by the high level of population density and small landmass, leading to the astronomic extension of the state residence to Ogun state (the neighbouring state). In spite of the incessant campaign of the agency against illegal dumping, 137 (76.5%) of the respondents attested to the lackadaisical attitude on the side of Lagos residents on their activities of waste disposal, thereby impeding the resilient efforts of the waste management agency in reducing environmental hazards.

Poor electricity supply is a major threat to various components of technology-driven assignments. This is *sine qua non* to solid waste management equipment. Reacting to this, 132 (73.8%) of the respondents acknowledged this fact. It, therefore, follows that this assertion is true, owing to the fact that the respondents are major stakeholders in the field of solid waste management in Lagos state. Also, respondents were asked to accept or decline whether capacity building on technical and institutional structures inhibits their performance. In their reaction, over 80% fell in the agreement category to this assertion. This is an indication that the waste management authority needs to beef up its technical and institutional wherewithal.

With respect to the non-compliance with environmental rules and regulations, 150 representing 83.8% of the respondents accentuated to the fact non-compliance is one of the major causes of indiscriminate dumping system in the state. Previous studies have also identified inadequate funding as a major constraint to the activities of the agency. However, this study provided a confirmation, as shown by 64.2% agreement level with the assertion.

Furthermore, considering the magnitude of waste generated in the state, 144 (80.5%) of the respondents identified inadequate technological advancements in the execution of various methods of solid waste management, thus making the concerted efforts of the waste management agency in the state to be unnoticed. An average of 70% and 30% of the respondents agreed and disagreed respectively with the assertion that improper planning by the government on environmental sanitation is one of the challenges faced by LAWMA in the state. The implication of this result is that only a few people have noted the commitment of government and its agency

in the enforcement of environmental sanitation as civic duties, while majority seems not to be comfortable with the government arrangement on environmental sanitation. It could therefore be inferred that government needs to stand firmly on its course of environmental sanitation so as to ensure a hazard-free environment in Lagos state.

**TABLE 2: Challenges Facing the Waste Management Authority in Lagos State**

VARIABLES	STRONGLY AGREE		AGREE		DISAGREE		STRONGLY DISAGREE		N = 179	
	<i>f</i>	%	<i>F</i>	%	<i>F</i>	%	<i>f</i>	%	$\bar{\chi}$	Remark
Non-availability of land for waste disposal is one of the challenges of waste management in Lagos state	73	40.8	69	38.5	-	-	37	20.7	3.20	Agreed
Lackadaisical attitude of Lagos residents on proper waste generation and storage inhibit proper waste management by the authority	55	30.7	82	45.8	6	3.4	36	20.1	3.04	Agreed
Poor electricity supply to power solid waste management equipment is another problem hindered the performance of waste management Authority	71	39.7	61	34.1	6	3.4	41	22.9	3.10	Agreed
Lack of capacity building on technical, environmental, social and institutional structure inhibits the performance of LAWMA in reducing environmental hazards	44	24.6	115	64.2	-	-	20	11.2	3.13	Agreed
Non-compliance with environmental rules and regulations enacted by LAWMA is one of the causes for indiscriminate dumping of refuse in the state	78	43.6	72	40.2	-	-	29	16.2	3.27	Agreed
Inadequate funding from government and non-payment of services rendered by LAWMA to the citizens hindered effective service delivery	58	32.4	57	31.8	14	7.8	50	27.9	2.89	Agreed
Inadequate technological advancements in the execution of various methods of solid waste management is affecting LAWMA performance	63	35.2	81	45.3	3	1.7	32	17.9	3.14	Agreed
Improper planning by the government on environmental sanitation is one of the major problems faced by LAWMA in the state.	72	40.2	50	27.9	17	9.5	40	22.3	2.99	Agreed

Source: Field Survey, 2015

NB:  $f$  = Frequency  
% = Percentage  
 $\bar{x}$  = Mean value  
N = Total Number of Respondents

## **6. Summary of interview Analysis on Challenges facing the Waste Management Authority in Lagos State**

To complement the data gathered through questionnaire administration, the interview was conducted to some key personalities on the challenges facing the waste management authority in Lagos state. The interviewees enumerated some of the major challenges that incapacitated the authority to perform its duties as expected by the public; as inadequate funds from government that led to the involvement of Public Sector Participations. Some interviewee reiterated that, even with the involvement of PSPs, the personnel and equipment for waste collection are insufficient; compare with the high population density and economic activities of the state. Landfill managers in virtually all the study areas revealed that insufficient land is another one of the major problem facing waste management authority for waste disposal in the state and this has resulted in spending a lot of money constructing landfills. Furtherance to this, one of the landfill manager interviewed asserted that the topography of some of these landfills posed a lot of challenges for the trucks while offloading during raining season. To affirm this statement, the researcher also witnessed some of the challenges faced during the raining season when visited one of the landfills/dumpsites. The adverse effect of this is that the condition restricts the movement and the number of trips a truck can go per day. Also, majority of interviewee revealed that lackadaisical attitude of Lagos residents, especially residents in the ghetto suburb on the proper waste generation and storage posed a lot of challenges on waste management in the state. In most of these suburbs, the canal and gullies were fully loaded with solid waste inhibiting the free flow of drainage. Another waste management problem garnered through interview is non-compliance with the environmental law, non-payment of bills through service rendered by LAWMA is one of the problems of fund facing the authority.

In addition, just a few of the interviewees discussed on poor electricity as one of the challenges. This few people were holistic in their views, talking on the higher capacity of waste management especially in the area of powering the recycling equipment. It was discovered during the

interview with the top officials that, waste management authority has not been actively involved in recycling plants, although the process is underway. Another challenge was revealed that most of the collection trucks caused a lot of mess on the road with flying tipping of waste from moving vehicles within the state and lastly indiscriminate dumping habit of Lagosians.

## **7. Conclusion**

The objective of this research was to investigate some challenges that serve as an impediment to effective solid waste management in Lagos state, Nigeria. In order to pursue these objectives, the research used primary data to collect information from experts who worked in the area of solid waste management and the populace who, at the receiving end of the waste management service. It was revealed from the findings of this study that waste reduction seeks to reduce waste from being generated, waste reduction strategies include using less packaging, designing products to last longer, and recycling/reusing products and materials. Waste reduction helps reduce handling, storage, and disposal costs and ultimately reduce society from being vulnerable to an unhealthy environment.

This study concluded that non-availability of land for waste disposal (79.3%), lackadaisical attitude on the side of Lagos residents (76.5%), poor electricity supply (73.8%), inadequate funding (64.2%), lack of proper planning by government on environmental sanitation (70%), capacity building (80%), inadequate technological advancements (80.5%), non-compliance with environmental rules and regulations as a resultant to indiscriminate dumping by the public (83.8%). Oresanya (2008) affirmed this by saying that about 66 per cent of the solid wastes in Lagos metropolis were disposed of indiscriminately. These constitute socio-technical challenges to Lagos State Waste Management Authority. Therefore, the findings of this study established these challenges as hindrances to more effective and efficient waste management system in the state. These challenges were conferred by Oresanya in 2011.

## **8. Recommendations**

The following recommendations were proffered to help the LAWMA and other environmental agencies in the, in reviving those areas affecting its efficient performance for better service delivery in providing healthy and hazard free environment. This study recommended that

adequate planning should be the first step in designing or improving a waste management system in any society. Governments, as well as waste management planners, should take into consideration institutional, social, financial, economic, technical and environmental factors for efficient and effective solid waste management system.

Finance is the bedrock of any organizations either public or private, adequate funds should be readily available for various environmental agencies responsible for waste management, such that fund will be allocated directly to waste management agency. Purchasing of sophisticated tools and maintenance of institution required much money, this money should be made available for the authority as to when due.

It is also recommended that peoples attitude towards wastes generation and disposal be curtailed. They should shun the attitude of dropping waste inside gullies and canal. Also, the environmental agency should intensify effort on public enlightenment programmes by letting the residents aware of the resultant effect of improper and indiscriminate dumping.

The study further recommended that LAWMA strengthen its effort on waste to power generation schemes to power solid waste equipment. The Ikosi waste to energy plant should be upgraded as a source of power supply. Not only to power waste equipment but also to generate electricity to some part of the state.

It is finally recommended that solving the problem of non-availability of land for waste disposal, lack of space for landfill sites because of the daily increase in waste generation in the state, this challenge informed the decision to replace the dumpsites in the state with proposed transfer loading stations, designed with the capacity for to handle several tons of waste. The study recommended that government should not relent on the project. Four out of proposed 20 is already complete and started operation. This will go a long way to solve the problem of non-availability of land. Also, it is recommended that these transfer loading station should be properly maintained to avert obnoxious smelling since they were located in residential areas.

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