Emergent Issues in Sustainable Management of Municipal Solid Waste in Nigeria

by

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1.0 INTRODUCTION

The management of Municipal Solid Waste (MSW) in Nigeria has been variously discussed and expounded in researches and publications, and some efforts made to operationalize the concepts involved. It is essentially the execution of processes involved in the handling of the waste from generation to disposal in a manner that will not detract from the quality of the environmental. In spite of the increasing awareness and availability of techniques to manage MSW, and the efforts of the different tiers of government in this regard, there does not seem to be any substantially palpable impact on the Nigerian environment. This situation is suggestive of either a misapplication or inapplicability of available techniques or both, and is of grave concern to stakeholders.

Municipal Solid Waste refers to non-flowing type of wastes collected by private and public authorities from domestic, commercial and some industrial (non hazardous) sources. It is indeed the totality of non-liquid and gaseous wastes generated in a municipality, especially from houses and shops, excepting the ones that are hazardous. By its very nature, when this waste is generated, it is generally unwanted by the principal generator. The waste remains at the point of generation or deposition until it is physically removed for effective disposal. So, MSW causes a lot environmental and health hazards. It releases toxic gases into the atmosphere and pollutes the air we breathe; contaminates ground water; produces offensive odours; causes obstruction of passages and traffic flow; blocks waterways and drain channels; elicits flooding; destroys environmental aesthetics; etc. On the overall, MSW jeopardizes public health and diminishes environmental quality.

It is the bid to contain these numerous adverse effects of MSW on the society that has channeled attention to the subject of its management. This ensures a concerted execution of the processes of generation, storage, collection, transportation, transfer, processing (or treatment) and disposal of the waste in a manner that drastically reduces, if not completely eliminates the pollution potential of the waste and render it harmless to human and animal lives. Several efforts have been made in various parts of Nigeria to effectively manage MSW in a sustainable pattern. Sustainability requires a current style of management of the waste in a manner that will not jeopardize the ability of future generations to live their own lives, manage their own wastes, and achieve their own targets.

Governments at different levels in Nigeria have adopted various approaches for the management of MSW, with relatively little success at achieving sustainability of the process. This presentation is intended to provoke thoughts in professional stakeholders on some of the likely factors that will engender effective and sustainable management of Municipal Solid Waste in Nigeria. The major reference in this regard will be Rivers State. The overall objective is to attempt to manage our waste beneficially.

2.0 MANAGEMENT OF MSW IN NIGERIA

2.1 Background

Nigeria is a large country with a correspondingly huge population. World Bank Report of 2011 puts Nigeria's population at 162,470,737. The implication of this is the generation of very large volumes of MSW. This is exacerbated by the high rate of unemployment in the country - breeding poverty, illiteracy and a continual increase in population, and urbanization and industrialization.

The waste generated in some cities in Nigeria as at 2009 has variously been presented as in the Table 1 below.

Table 1: Municipal Solid Waste Generation for Some Cities in Geopolitical Zones in Nigeria

City	Population	Tonnage/ Month	Density (kg/m3)	Kg/Capita/Day
South West				
Lagos	8,029,200	255,556	294	0.63
Ibadan	307,840	135,391	330	0.51
Ado-Ekiti	241,200	9,518	-	0.71
Akure	369,700	-	-	0.54
Abeokuta	529,700	-	-	0.66
South East				
Nsukka	100,700	12,000	370	0.44
Onitsha	509,500	84,137	310	0.53
Aba	784,500	236,703	-	0.46
South South				
Port Harcourt	1,053,900	117,825	300	0.60
Warri	500,900	66,721	-	0.60
Uyo	102,400	20,923	-	0.60
North Central				
Abuja	159,900	14,785	280	0.66
Makurdi	249,000	24,242	340	0.48
Ilorin	756,400	-	-	0.43
North West				
Kano	3,248,700	156,676	290	0.56
Kaduna	1,458,000	114,433	320	0.58
North East				
Maiduguri	971,700	850,000	-	0.58

Adapted from Abila and Kantola (2013) and *Tobore (2013)*

The total MSW generation in Nigeria at this time was 25 million tonnes annually. Considering the 2011 population figure, by this 2015, with a 2% incremental rate Nigeria's population would be 175,863,551. This will attract equally sporadic increase in the volume of waste generated. Evidently, the waste generated is threatening both the present and future; so, effective and sustainable management strategies are a necessity.

The Nigerian constitution provides that the responsibility to manage solid waste is that of the Local Government Area (LGA) Councils. But, clearly the government at this level,

overwhelmed by the enormity of the task, perhaps due to poor finances, lack of human and technical capacity, inadequate planning and lack of foresight, could not cope with demands of the amount of wastes generated. The result was a massive accumulation of solid wastes along city roads and market centers. This embarrassing situation caused state governments to establish Agencies to address the waste management issues. However, despite the active involvement of the state governments, only little success has been achieved, as effectiveness and sustainability are still a far cry. The governments spend '20-50 percent of their budgets on MSW management, only 20-80 percent of the waste is collected'.

2.2 Current Management Processes for MSW

Amongst the critical components of the solid waste management process, otherwise called the functional elements of the process, namely storage, collection, transfer, transportation, processing and disposal, the ones widely implemented in Nigeria are collection, transportation and disposal. Although we are far away from contemporary Best Environmentally Practicable Options in the management of MSW, we have recorded substantial improvement in our chosen options.

In **Port Harcourt, Rivers State**, there are no named waste receptacles. The wastes are brought by residents to some informally designated points along the roads, especially at spaces provided for bus stops between 6pm and 6am daily. Within the same time frame, compactors owned by contractors will be used to continually be evacuating the wastes to dumpsite, such that the waste does not remain there to obstruct traffic or constitute any form of environmental nuisance during the day. The contractors are under contractual obligation to ensure compliance, and any breach would attract the attention of the supervisory Agency to do the evacuation and surcharge the contractor. This is somewhat different from the situation about a decade ago, when trucks were used for the evacuation and will rather redistribute the wastes along the road before it gets to the dumpsite. Now, however, the concern is that some operators work outside of the scheduled time and block access with their compactors; they load the compactors beyond their compartments, thus exposing the waste; and sometimes park their full-loaded compactors along the road.

For this operation, the city is subdivided into 56 zones, and each zone is required to have a regulated minimum of three compactors, even though it was found that all the three are not always functional at the same time. The Agency maintains seven compactors for interventionist operation. These are now used for a pilot scheme to work on the long stretch road from the section of Airport road at Igwuruta to UST Roundabout, Mile 3, Diobu. The wastes collected are dumped at four different dumpsites at Eliozu, Eneka, Iwofe and Oyigbo. The later was supposed to be operated as a landfill, but was not, and later closed before it was full because of offensive odours and other environment nuisances that sparked complaints and protests from the community. The Eliozu dumpsite will soon be full, and then closed.

The waste management contractors work for, and get paid by the government. The residents do not bear any burden, except to bag their wastes and deposit them at the informal receptacles. In spite of this, some residents prefer to dump their wastes into drains, especially into flowing storm water during the rains. However, the current waste management arrangement in the state has largely enhanced the sanitation of the environment, especially along major roads.

In September, 2012 the state, in partnership with LEF UK and Anpez Centre for Environment and Development commenced arrangements for the transformation of domestic wastes into useful byproducts, in a waste-to-wealth programme. So far the partnership has successfully trained about 58 locals in the art of recycling plastics and nylon bags into interlocking stones, but there is no waste recycling plant in the state. There is also the metal recycling factory at Tai, which is largely nonfunctional as at now. In fact the equipment procured for that purpose are rotting away.

In the **Federal Capital Territory, Abuja**, Kadafa, *et al* (2013) say solid waste management is handled by the Abuja Environmental Protection Board (AEPB). The AEPB contracted the waste disposal to 20 contractors, which engage in door-to-door collection for the residential areas, collection point evacuation for commercial areas and institutions within the Federal capital city (FCC). The FCC as three landfills operated merely as dumpsites, namely the Mpape, Gosa, and Ajata dumpsites. A fourth one at Kubuwa was forced to close down shortly after it was opened in 2004, due to serious offensive odours and incessant fire outbreaks. Of these three, only two (Gosa and Ajata) are currently functional. The other five Area Councils have their own dumpsites. Under the contractual agreement with the contractors, the AEPB contributed 20% of the funds to procure 50 compactors and 12 street sweepers, which were distributed to the contractors. The technical partners were to remaining 80%, but failed in this obligation, and this seriously affected waste disposal in the city.

Lagos State has recorded tremendous success in the processing of MSW into other useful by-products, like fertilizer. Waste management is handled by the Lagos Waste Management Authority (LAWMA). Waste collection is done by over 300 private sector participants, on a door to door basis, at a frequency of about once or twice a week. These wastes are deposited in dumpsites, and there are five approved ones. Presently the State government is striving to extract methane from two of its dumpsites at Olusohun and Abule Egba.

Waste recycling is at a high level in Lagos. There are recycling banks where households are encouraged to deposit their recyclables, like plastics, cans, bottles, etc, and are compensated for so doing. The organic components are collected from door-to-door. In Lagos State, MSW disposal is now viewed not necessarily as a natural problem, but as an opportunity for recovery and utilization of potentially valuable materials. Some of the recycling programmes in Lagos State are:

- Compost plant at Ikorodu for the treatment of market waste
- Waste-to-Energy plant at Ikosi Market
- Plastic recycling plant at Olushosun for the conversion of water sachet into garbage bags –the Government introduced a buy-back programme for water sachet, cartons, paper and glass.
- Formulation of recycling clubs in secondary schools to instill recycling habit in young people

Excepting Lagos state that has made some long paces in MSW recycling, other states in the country are barely struggling with the business of collection and disposal of waste. Olanrewaju and Ilemobade (2009) in Kadafa *et al* (2013) researched on **Ondo state** Integrated Waste Recycling and Treatment Project, and recorded marginal success in the operation. Joel and Fansen (2013) investigated solid waste management in **Kaduna**, and found that the rapid urbanization of the municipality has led to

increased waste generation, which has overwhelmed the capacities of the Kaduna Environmental Protection Agency and Kaduna State Urban Development Authority. The case of **Enugu state** is somewhat amusing. The waste volume has surpassed the capacities of available dumpsites, such that people resort to burning or burying their wastes in the ground, and depositing at illegal open spaces (Amalu and Ajake, 2014).

Kadafa *et al* (2013) also reported the work of Babayemi and Dauda (2009), who evaluated solid waste generation, categories and disposal option in developing countries, using Nigeria as case study. They found large generation of of waste at high rates without corresponding efficient technology to manage the waste.

Evidently, in Nigeria, MSW disposal is still largely done by open burning, river dumping, use of borrow pits as dumpsites, burying of waste in the ground, etc, with all their attendant health and environmental hazards. So, while acknowledging the sharp departure from the grossly inefficient past of about ten years ago, our management practices are still at the lowest level of the reverse-pyramid waste management hierarchy, if not lower, as we are yet to dispose waste that meet any environmental standard.

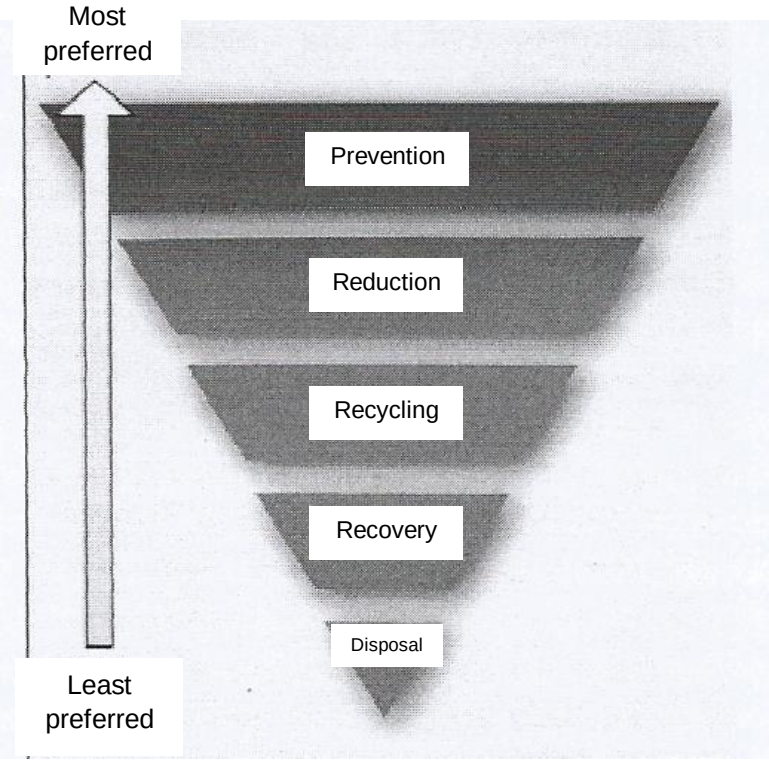

Figure 1: Waste Management Hierarchy

Disposal is the least preferred of the waste management options. But that's where the country unsatisfactorily is. This is in contravention of the cardinal principle of the Federal Environmental Protection Agency (FEPA) on MSW management in Nigeria, which had emphasized the enhancement of environmental quality as an integral component of waste management, via waste treatment (minimization, recycling and re-use).

3.0 Sustainability of the Management Processes

The overall concept of sustainability in human endeavours, with particular reference to the celebrated definition by The World Commission on Environment and Development (i.e. The Brundtland Commission), is intended to satisfy the aspirations of the present, without compromising the opportunities of posterity to meet their own goals. In this presentation, sustainability is viewed from the literal meaning of the word, in terms of whether the management approach can continue for a long time and endue successive socio-economic and political transitions; and also from the perspective of the Brundtland report, namely that if it continues for a long time, will it be kind to the environment such that other persons can also freely operate in it?

The management approaches to MSW in Nigeria as outlined earlier have been mainly the ones that jeopardize public health and environmental quality. An integrated management approach to MSW would be required in Nigeria to ensure that the MSW handling will not further introduce pollutants into the environment, especially beyond the carrying capacity of the environment, to compound the ones caused by the waste itself.

3.1 Fundamental Issues in Sustainability of MSW Management

A sustainable waste management approach would require waste minimization, resource recovery, in terms of recycling, reuse and energy generation. Above all, it would consider the waste management as a business, where the operators would be scouting for the waste themselves and waste generators would be hoarding their waste. Sustainability would require the provision of appropriate infrastructure and institutional and regulatory frameworks, such that when FEPA makes a policy pronouncement on the enhancement of environmental quality, say, through waste minimization – recycling, reuse and energy generation, there will be appropriate legislation to empower the Agency to enforce compliance.

There are yet additional factors that could enhance the sustainability of MSW management processes, as follows:

i. Comprehensive and professional planning for MSW management programme
ii. Proper planning of our cities and town at the urban and rural areas
iii. Baseline and improvement data be properly documented to constantly provide development information
iv. Effective public enlightenment
v. Making the waste business attractive and lucrative
vi. Making the waste business beneficial to the waste generator
vii. Limiting/reducing government funding of the MSW management process
viii. Encouraging private sector participation
ix. Stopping the consideration of waste management as a political goldmine

4.0 CONCLUSION

The management of MSW has no doubt taken a centre stage in the scheme of governance in Nigeria; but it is associated with so much rigmarole that the end result presents us as a nation in a cyclical circus show, all the time coming back to square one (like is often said). There are fundamental issues that put us in this spectacle. Lack of adequate and appropriate planning; lack of desirable focus, and inappropriate techniques and technologies are some of the limiting factors. The country has to look beyond the collection and disposal of waste, which it has not even done properly, and

make concerted efforts to convert its wastes to a variety of useful byproducts. This will make MSW management an attractive and beneficial venture for all stakeholders, and thereby sustainable.

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