

ADDING VALUE TO MUNICIPAL SOLID WASTE IN NIGERIA THROUGH MAPPING

BY
MacbedaUche MICHAEL-AGWUOKE¹
and Surv. Bernard Orji EKPETE²

PRESENTATION OUTLINES

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KEY WORDS

- ▶ Municipal solid waste
- ▶ Waste management hierarchy
- ▶ Waste information mapping
- ▶ Waste - to - energy

ABBREVIATIONS

- ▶ MSW- Municipal solid waste
- ▶ 3R - Re-use, reduction and recycling
- ▶ WtE - Waste - to - energy
- ▶ WIM - Waste information management

INTRODUCTION

- ▶ Traditionally, rubbish is forgotten after leaving them out for collection or after visiting the dump
- ▶ Developed countries have used legislation to enforce proper waste disposal
- ▶ This is not the case in developing countries like Nigeria

ABSTRACT

- ▶ *The paper is a logical and systematic presentation of municipal WIM of Nigeria using Solid waste analysis protocol incorporated into GPS mapping and GIS database to reflect the MSW characterization in Nigeria. It is a call to Nigerian Surveyors to contribute to solving the MSW problem in Nigeria by providing some of this needed data/information through mapping. The paper also provides the necessary guide towards providing accurate and reliable WIM. The envisaged problems that may be encountered are highlighted and solutions suggested. Conclusion It is believed that an accurate WIM of Nigeria will not only provide information for decision makers in government but also investors in relevant sectors of the country's waste stream and encourage further research in the waste sector.*

Definition of waste

- ▶ Michael–Agwuoke (2012) defined waste as:
- ▶ *Residual materials which are as a result of human activities which cannot*
- ▶ *be reused or recovered as a resource, recycled into material production processes*
- ▶ *or thermally/biologically utilized for energy production.*
- ▶ Other definitions of waste demonstrating the changing concept of waste include that by the Organisation of Economic Cooperation and Development (OECD) who define waste 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”.* (OECD, 2003).

Definition of waste contnd.

- ▶
- ▶ The Basel convention defined waste as: (UNEP, 2004)
- ▶ *“Substances or objects which are disposed or are intended to be disposed*
- ▶ *or are required to be disposed of by the provisions of national laws”*
- ▶
- ▶ *The United Nations Statistics Division (UNSD): (UN Statistics Division, 2011)*
- ▶ *“Wastes are 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”.*
- ▶

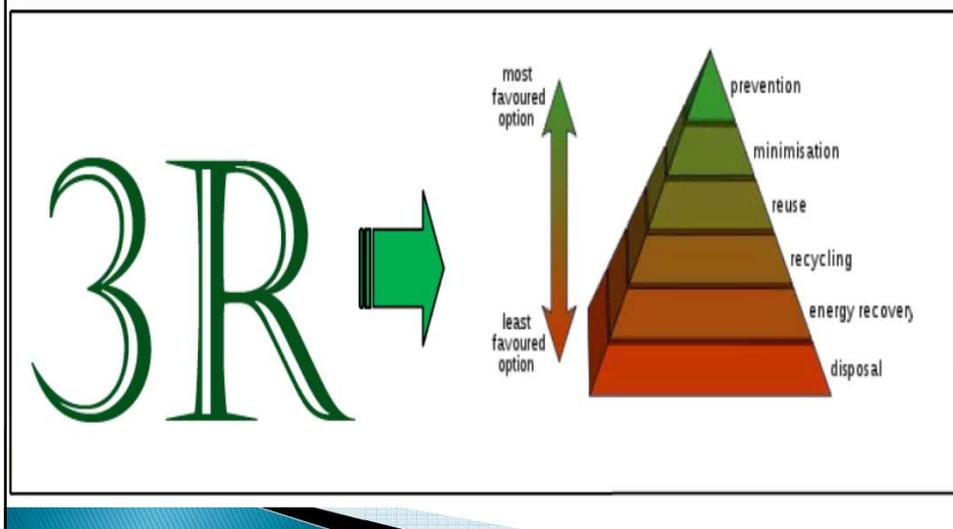
Definition of waste contnd.

- ▶ Zero Waste America defines waste as: (Zero Waste America, n.d.)
- ▶ *"A resource that is not safely recycled back into the environment or the marketplace."*
- ▶
- ▶ This definition takes into account the value of waste as a resource, as well as the threat unsafe recycling can present to the environment and public health.
- ▶
- ▶ The Waste Framework Directive (Directive 2006/12/EC) (European Union, 2006), as amended by the new WFD (Directive 2008/2008/98/EC) (European Union, 2008), define waste as:
- ▶
- ▶ *"Any substance or object which the holder discards or intends or is required to discard"*.

The 3R'S

- ▶ Re - use
- ▶ Reduction
- ▶ Recycling

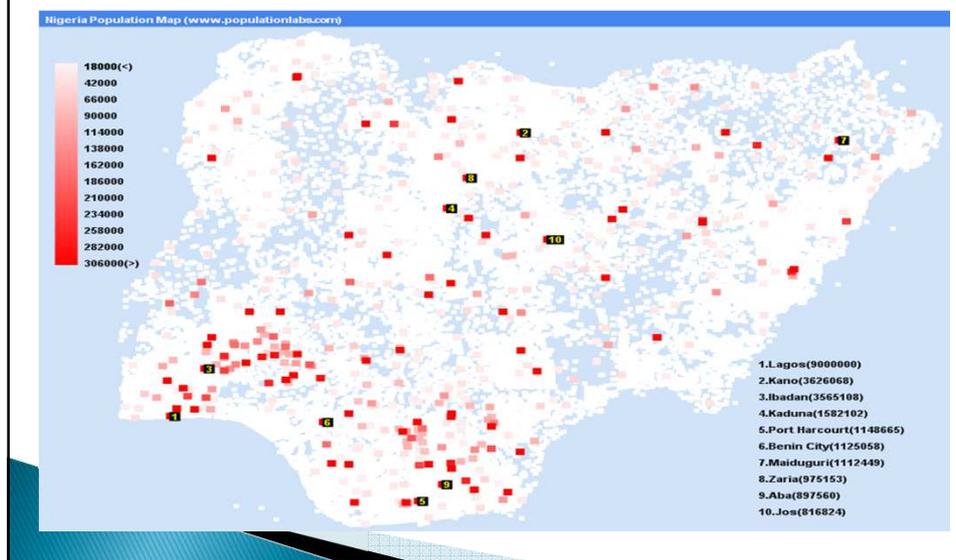
Evolution of waste management hierarchy (Source: Michael–Agwuoke, 2012)



What is waste information mapping

- ▶ This is the process of classification and characterization of waste including the geocoding of the waste location. In this way, the location and composition of the wastes including generation data are properly documented and can be referred to by stakeholders. The accuracy of the WIM is determined by the size of the geographic locations on which the waste information are tied and the number of classification/characterization showing the waste composition.

Nigeria Population map (Populationlabs.com, 2011)



Steps in undertaking WIM

Stages in executing a WIM cover the following:

- ▶ Decide on the geographic size of the classification area
- ▶ Decide on the pattern of definition which may be as points or as polygons
- ▶ Carryout the mapping using suitable mapping method(s), which will achieve the required accuracy level.
- ▶ Collect appropriate waste samples for classification, making sure that the samples are tied to their geographic locations.
- ▶ The samples are sorted accordingly into the possible classes as shown in Figure 2. The higher the number of classes, the better the purpose it can serve.
- ▶ The sorted samples are weighed. The simplest check on data entry are the totals before and after sorting.
- ▶ Produce the Waste Information Map of the area.
- ▶ Items containing hazardous waste (materials) will always be classified as hazardous waste (e.g. tins with paint residues or a medicine bottle with a few pills left in it, etc)

PROBLEMS AND SOLUTIONS

- ▶ The major problem that will be faced in realizing the objective of this exercise is funding. This is as a result of lack of political will from the politicians who are the decision makers. This is very visible in the management of waste in Nigeria. MSW management has not been given its pride of place in the governance process. But this clarion call can be the impetus to push the private sector into waste management. Private survey firms can go into public/private partnership with government to develop this database which will create the awareness on the volume and type of waste being generated in Nigeria.
- ▶ Secondly, expert ideas to execute the mapping may be lacking in the country presently. This is because we have not seen reasons to carry out serious studies on waste. Recognizing that waste industry is worth billions of dollars if well managed, will create the interests in research and development from which the required expertise will emerge.
- ▶ Throwing pay policy should be implemented to help in providing some of the required funding for waste management projects.
- ▶ Covering the entire country is a big task. But having the courage to start the mapping is the first step towards the success.

CONCLUSION

- ▶ Providing complete database of waste generation and composition trends in Nigeria, will open the waste sector for investments, creating jobs, preserve existing raw material, save foreign reserve in importation of raw materials and keep our environment clean. Therefore, we should consider it as a necessity and give it the urgent attention it deserves.

REFERENCES

- ▶ Beck, I. R. W. (2001). *U.S. Recycling Economic Information Study: National Recycling Coalition INC.* . Retrieved from http://www.epa.gov/osw/conserva/rrr/rmd/rei-rw/pdf/n_report.pdf
- ▶ CEWEP. (n.d.). *What about the energy produced in waste-to-energy plants - is it renewable?*. Retrieved 12 March, 2012, from http://www.cewep.eu/whatiswastetoenergy/wtefaq/471.What_about_the_energy_produced_in_Waste-to-Energy_plants__is_it_renewable.html
- ▶ European Union. (2006). *Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste*. Retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32006L0012:EN:NOT>
- ▶ European Union. (2008). *Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives*. Retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:312:0003:0030:EN:PDF>
- ▶ Gartner Lee. (1991). *Procedural Manual for Municipal for Solid Waste Composition Analysis* (GL 90-738): Prepared for British Columbia Ministry of Environment, Gartner Lee Limited. April.
- ▶ Michael-Agwuoke, M. U. (2012). *Is waste-to-energy changing the definition of waste?* presented at the 3rd International chemical and environment conference ICEEC 2012, Kuala Lumpur, Malaysia, 21-23 December, 2012
- ▶ OECD. (2003). *Glossary of Statistical Terms: Waste*. Retrieved 23 July, 2012, from <http://stats.oecd.org/glossary/detail.asp?ID=2896>
- ▶ Populationlabs.com. (2011). *Nigeria Population Map*. Retrieved 17 March, 2013, from www.populationlabs.com/Nigeria_Population.asp

THANK YOU
FOR LISTENING