

Key Drivers to Sustainable Waste Management: A Compendium of Academia and Waste Managers Perspective

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LAWMA

New Trend in Efficiency & Professionalism

Outline

- Introduction
- Our Version of Events in MSW
- A Case study of Europe's MSW programmes
- Proposed Drivers of Sustainable Waste management
- A Triple Helix System Approach
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Introduction

- Global sustainability has been defined as the ability to "meet the needs of the present without compromising the ability of future generations to meet their needs."
- Similarly, sustainable development "is a process of achieving human development... in an inclusive, connected, equitable, prudent, and secure manner."
- A sustainable waste management, therefore is one that aims to address these long term pressures through the recovery, recycling, and reuse of resources, minimisation of waste streams and system drivers. But of course this includes management of resources in an environmentally sound and economically manner.
- The concept of 'System Drivers' is defined as an event that changes the status quo of an existing waste management system (in either positive or negative direction), be it legislation that encourages an integrated approach to waste management or change of public perception of a MSW management system



Our Version of Events: LAWMA History⁴

- Management of solid waste did not become a phenomenon in Nigeria until the early 70's, during to the oil boom. Consequently this was compounded by the emerging industrialization and urbanization resulting in high volume of waste.
- This was increasingly difficult for the Local Government Councils in Lagos State to manage
- In 1977, when Nigeria hosted FESTAC '77, the world press classified Lagos as the "dirtiest" city capital Consequently, in April 1977, the first waste management outfit in West Africa was instituted, as Lagos State Refuse Disposal Board (LSRDB) in Nigeria, under Edict 9 of 1977
- A progression of events brought us this far to the current Lagos Waste Management Agency created in 1991 under Edict No. 55, which made the agency to be responsible for the collection and disposal of municipal and industrial waste, as well as for the provision of commercial waste services to the State and Local Governments.
- There are 3 major landfills and 2 temporary sites serving well over 12 million populace with an approximately waste generation of over 3.9 million cubic metres yearly.
- Legislations / laws / guidelines on waste management need to be strengthen for capacity building in sustainable waste management

A Case Study of 11 Europe Waste Management programmes and the Search for Sustainability ⁵

- In search of drivers for sustainable municipal waste management among waste managers through structured interviews and focus group discussions
- Wilson et al (2001) presented his findings on sustainable approach to waste management. The research group visited 11 leading-edge waste management programmes in nine European countries: Brescia (I), Copenhagen (DK), Hampshire (UK), Helsinki (FI), Lahn-Dill-Kreis (D), Malmö (SE), Pamplona (E), Prato (I), Saarbrücken (D), Vienna (A), and Zurich (Switzerland)
- The key drivers also called system drivers identified were :
vision and stability; critical mass; adequate and available funding; flexible legislation; public support.

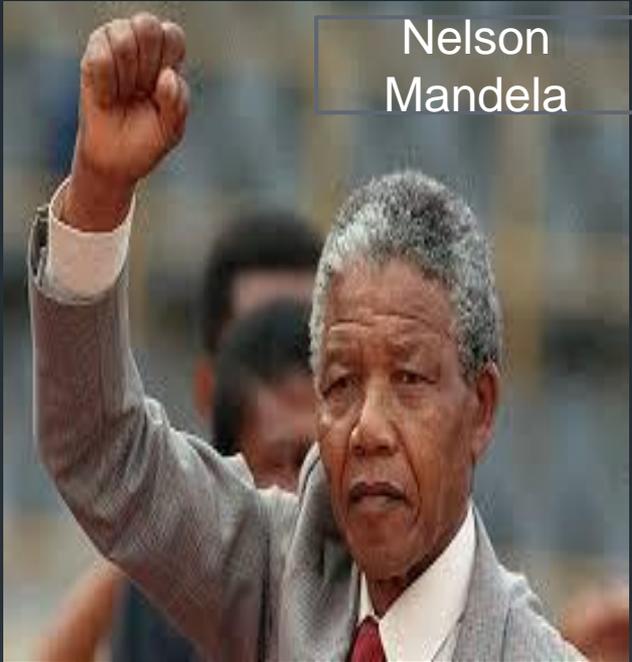
Proposed drivers of sustainable waste management; building resource/research capacity

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- The proposed drivers are listed:
 - 1. Vision and stability;
 - 2. Critical mass;
- 3. Data management for projection; resource and research capacity
- 4. Adequate and available funding
- 5. Legislation/enforceable guidelines;
- 6. Public support.



Walt Disney



Nelson Mandela



Obafemi Awolowo

Vision

- Waste managers frequently identify the importance of a long-term vision for the waste management system
- The delegation of administrative and managerial responsibilities and powers within the existing institutional structure can act either as a facilitator or constraint to changing and adapting the MSW management system.
- Changes in government and political climate can also affect MSW management policy
- These visions encompass more than just waste or integrated waste management activities. Rather, they place the municipal waste management issue within the larger context of urban resources management
- A fundamental philosophical shift emerges, where the concept of waste as something to be discarded had been transformed into a useful, valuable material called “resource”
- Several of the programs in Europe had adopted international management standards

Stability



- Vision is dependent heavily on Stability, hence without stability, Vision might be “bleak”!
- The MSW management investment and planning cycle must be much longer than the life span of most political office holders
- Stable leadership is essential to enable the operation of effective waste management systems.

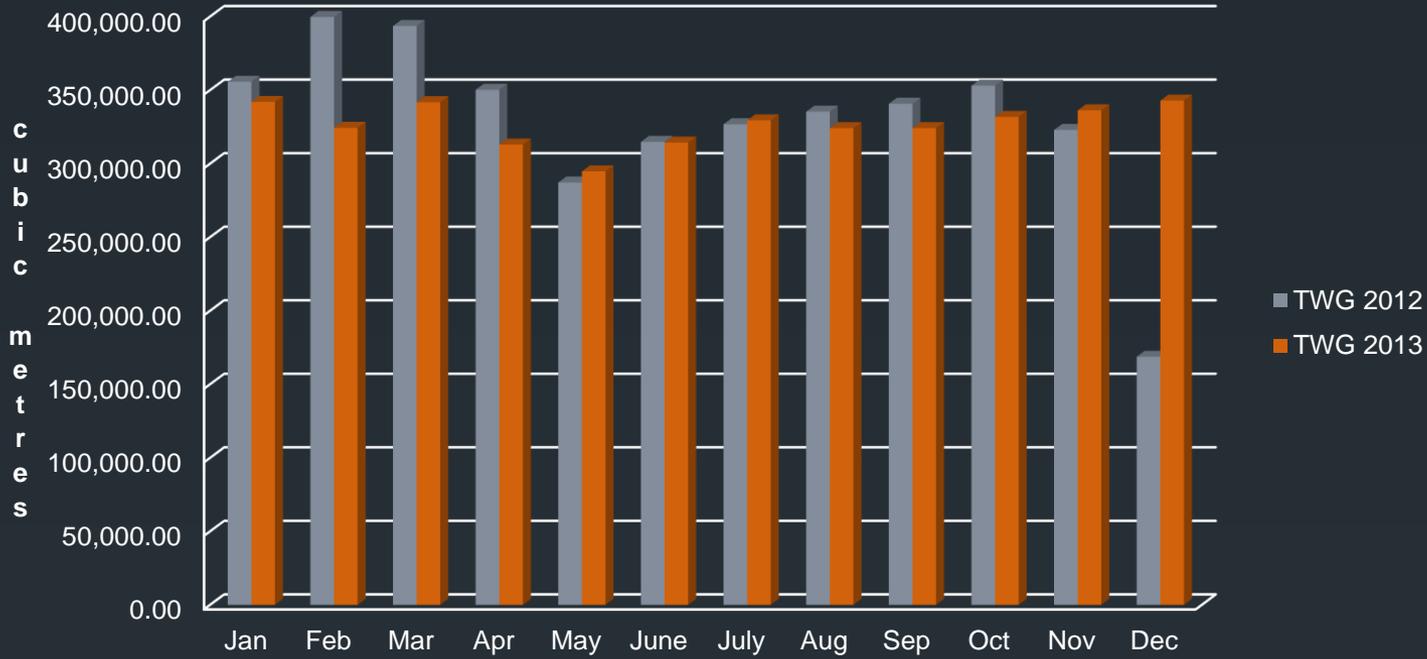
Critical mass

- Having enough waste to justify infrastructure investment and sufficient program scale was identified as a key driver
- The existing infrastructure (collection vehicles, Material Recovery Facility, incinerator and landfill) shapes what policies will be investigated and what options will be considered in the short to medium-term.
- Additionally, existing contracts (with regard to collection: recycling services or disposal sites) and legal obligations (unions, etc.) can also influence alternatives for policy adoption or program change.
- The size of the population serviced by the waste management system also plays a significant role in such changes.
- Control of different waste-streams, Construction and demolition waste plays a major contribution to reuse material

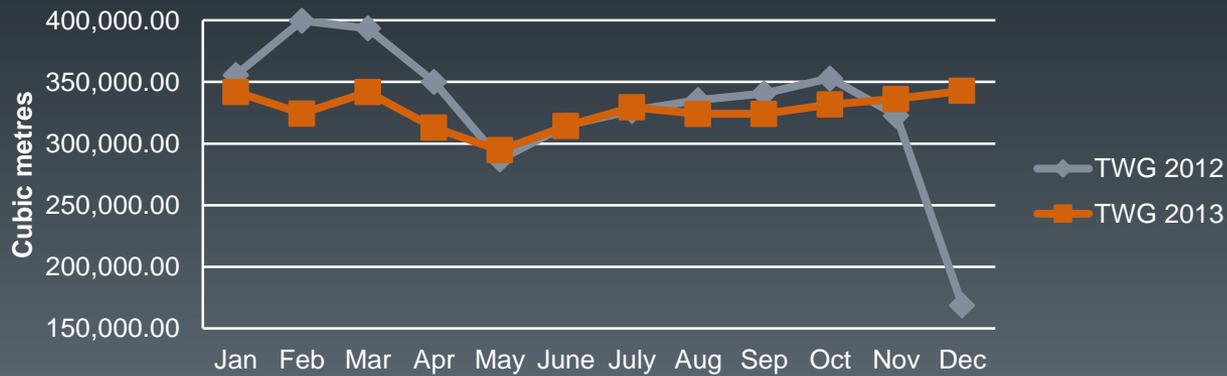
Adequate and available funding

- Economic and financial factors play a primary role in the municipal solid waste decision making process, and costs are continually rising
- The evolution of waste management from truck and dump, to the integrated systems that can be seen in many European countries today requires an investment of both time and resources.
- Remarkably, LAWMA is making effort in plunging in the integrated systems which is evident in the machinery and re-design of olusosun with funds made available, however this remains a gradual process.
- Access to capital, be it public or private, in the form of outside investments, loans, grants, or subsidies, plays an important role both in program planning and system realization.
- The UK's local budget cap, in place since 1990, has restricted many local waste management initiatives and a way forward was a public-private partnership that has resulted in increased capital flow and investment in the area's waste management infrastructure.

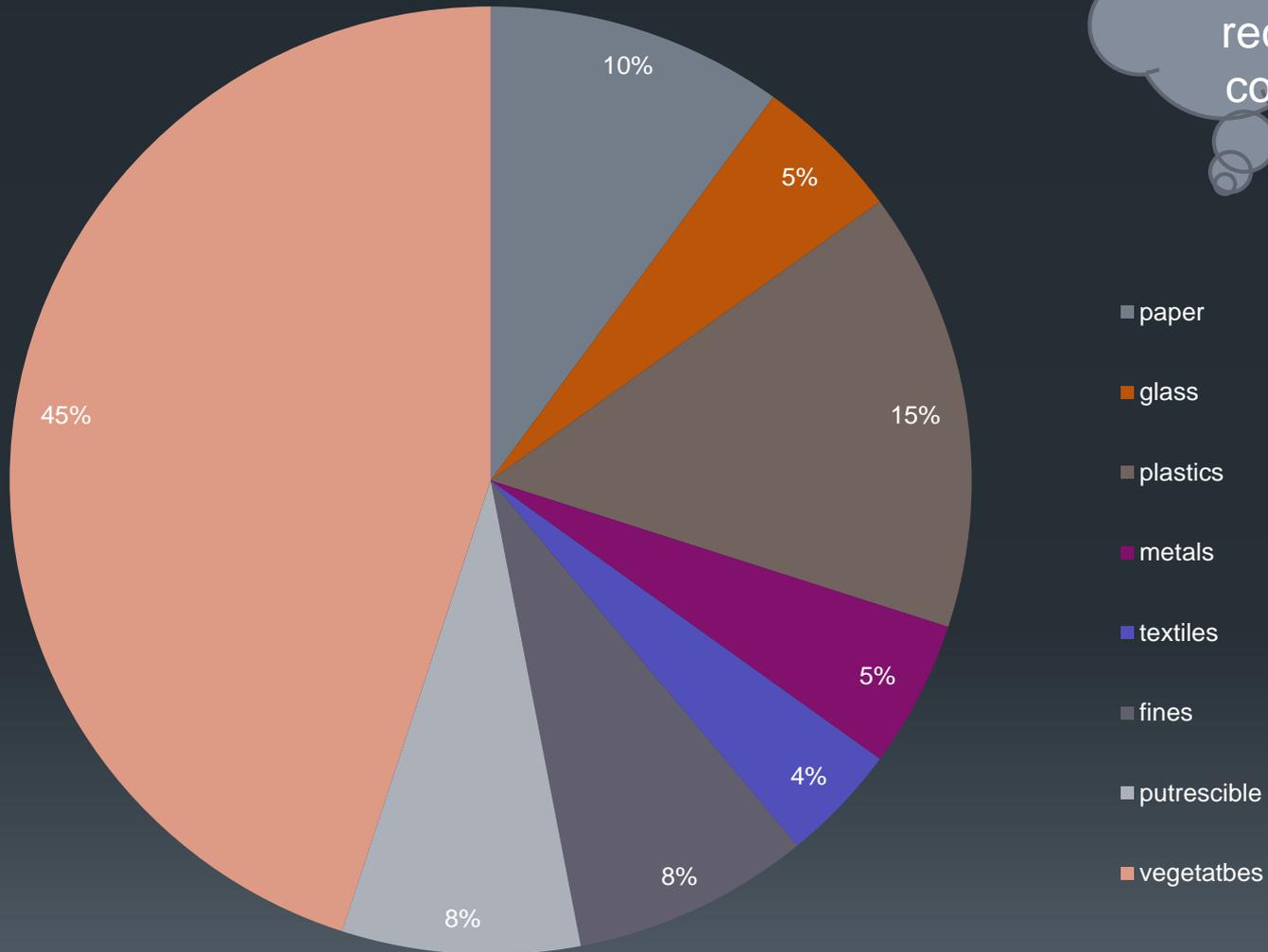
Trend of waste generated in Two Years 2012-2013



Trend of waste generated in two years 2012-2013



composition of waste stream



Data suggests that vegetable could recycled: compost

Data management and research capacity building

- Research capacity building through linkages between waste industries and universities/higher educational institution
- Already, it could be observed that LAWMA (statistics dept) do collect some data. However, an extension of data collection is data utilization for simulation and understanding the waste stream and its management.
- Use of soft wares to project long term contamination on site such as Landsim 2.5 model
- Furthermore, the groundwater vulnerability index of an area could be assessed using powerful soft ware such as DRASTIC model and ArcGIS (a spatial distribution of contaminants assessed, expressed in maps)

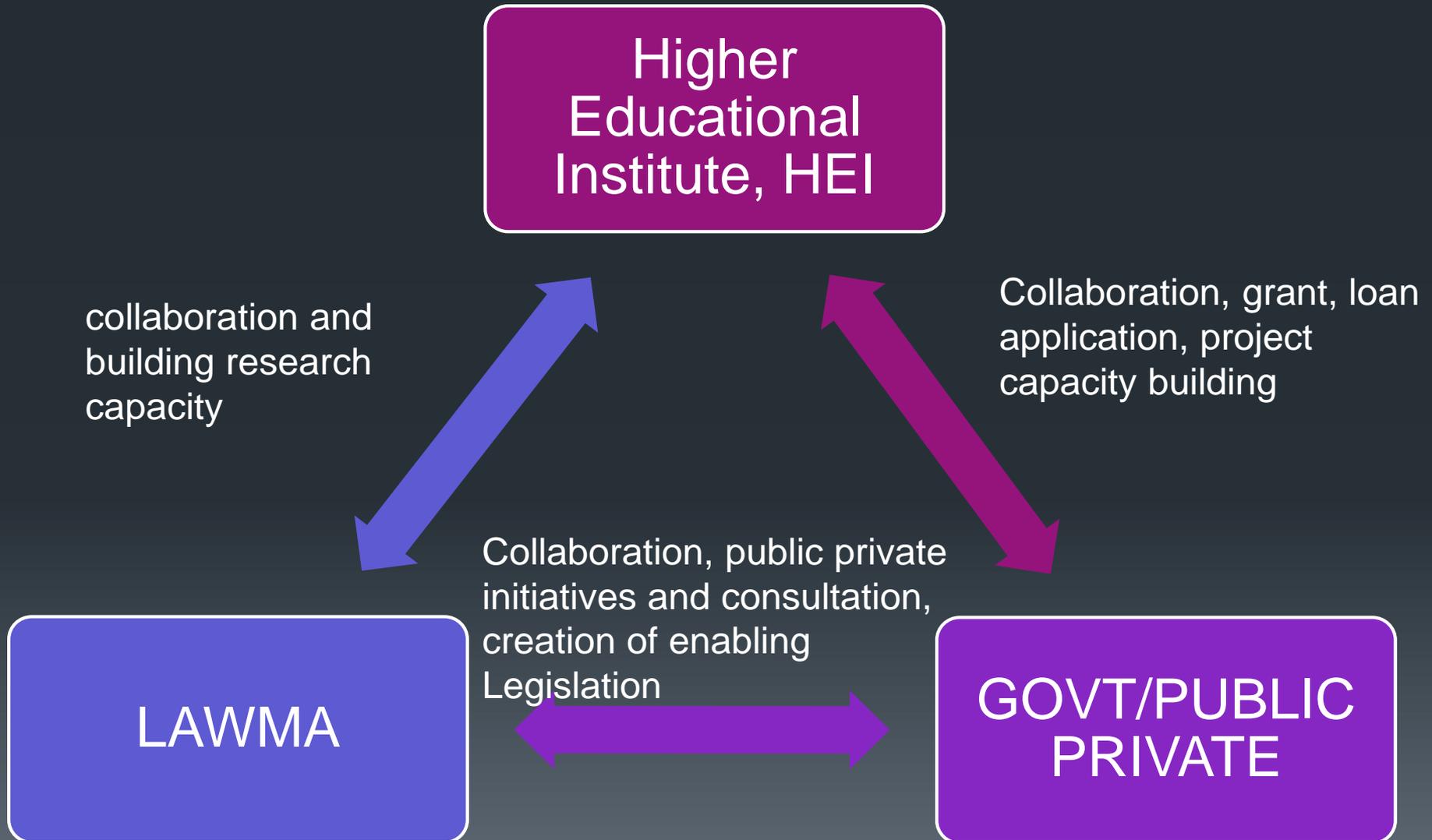
Legislation/Enforceable guidelines

- Legislation can have either positive or constraint impact on waste management and sustainability
- Enabling legislation, often results in increased management flexibility (e.g. legislation that sets final standards while allowing individual programs define the means to reach the standards, economic tools such as landfill taxes, pay as you throw systems are also good examples of enabling system)
- While prescriptive Legislation defines means or procedures that can restrict management flexibility (e.g. legislation that sets specific targets, or technical specifications)
- Legislation often helped to create more environmentally and socially responsible solid waste management systems. While much legislation has led to a tightening of waste management standards, certain legislation has undoubtedly led to system dysfunction.

Social consideration: Public support ¹⁶

- Community response to waste management initiatives in a system area is an important factor that can either foster or hinder program evolution
- Public involvement, whether through consultation or actual participation in decision-making and consensus building, is increasingly accepted globally
- While consultation includes education, information, sharing and negotiation
- Most MSW planning schemes have included the public through consultation, but often do not give them further opportunity for deeper involvement

Triple Helix approach



In summary

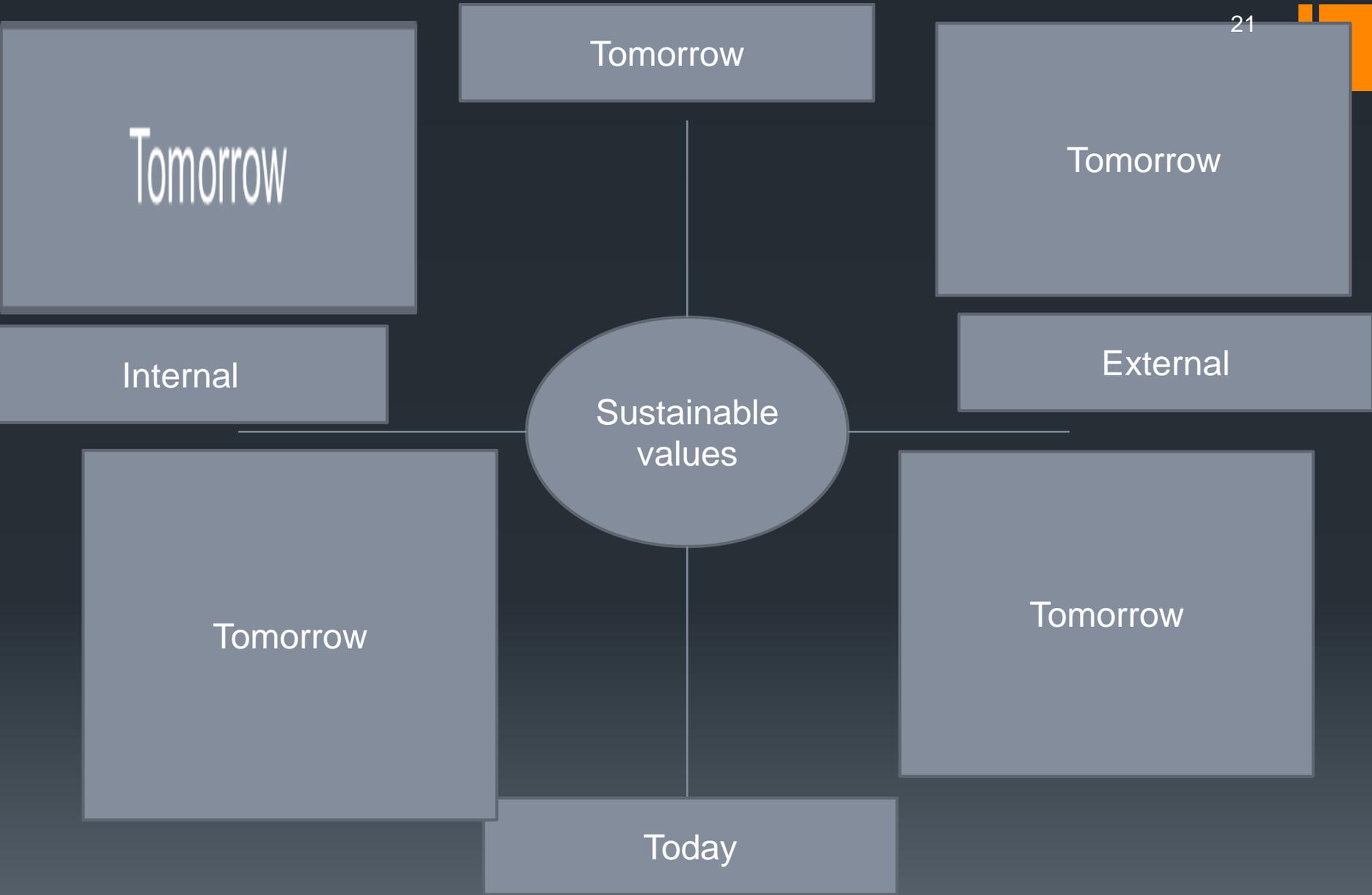
- It became increasingly clear to us that there was no one 'correct' way to manage waste or to create an integrated approach to waste management.
- Rather the process in Europe for example was one of continual evolution and system optimization. In Nigeria, An evolutionary trend was observed that began with waste management primarily addressing the issue of public health and safety (FESTAC 1977). Through an organized system of waste management optimization this initial approach is making conscious effort to embrace an integrated approach to waste management where economic, social, and environmental concerns are added to the system.
- While some of these System Drivers are influenced by the waste manager directly (daily operation, collection schemes, etc.) or indirectly (municipal legislation, local institutional structure), (internal drivers) In other areas, the waste manager has virtually no influence on legislation for example the European legislations.
- This paper identified six key drivers that essentially could help waste managers to plan and implement more integrated waste management systems whilst still sustainable

Conclusion

- Efficient municipal solid waste management systems require professional management, supported by an informed population and appropriate legislation and policies.
- All too often, there has been a disconnect from the people who are managing the waste, the academia and the policy makers. The purpose of this study was to explore, from both academia and waste manager's perspective, what was necessary for driving the LAWMA program towards more sustainable waste management encompassing economic, social and environmental goals.
- The ability of a system to evolve to operate optimally under constantly changing conditions depends upon its flexibility and resilience, which can be constrained or facilitated by both external and internal drivers.

Thanks you for listening





Tomorrow

Tomorrow

Tomorrow

Internal

External

Sustainable values

Tomorrow

Tomorrow

Today