

**URBAN ENVIRONMENT MANAGEMENT IN NIGERIA: WHO
WE ARE? WHERE ARE WE? WHERE SHOULD WE BE?**

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BY

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PREAMBLE

The Vice Chancellor
Eminent Scholars here present
Members of the University Community
My Lord Spiritual and Temporal
Distinguished Ladies and Gentlemen

I am a Town Planner, and my profession is Town Planning. Town Planning has developed under different traditions and institutional contexts, leading to variation in its naming across regions and schools of thought. In classic British term, it is known as Town and Country Planning, in the United States, Canada and many international organisations, it is called Urban Planning. Older American usage refers to it as City Planning. Other nomenclatures include Physical Planning (common in African and Asian countries), Spatial Planning (in parts of Europe), Land-use Planning (used UN-Habitat and FAO) and Territorial Planning (common in Latin America and some parts of European regions). Here in Obafemi Awolowo University, Ile-Ife, Nigeria Town Planning is referred to as Urban and Regional Planning (URP).

According to Keeble (1969:7), Town Planning is

the art and science of ordering the use of land and the character
and siting of buildings and communication routes so as to secure the
maximum practicable degree of economy, convenience and beauty.

Ratcliff (1974) complements this, by defining Town Planning as the provision of the right site, at the right time, in the right place, for the right people. To describe town planning as both an *art* and a *science* is to recognise its dual character as a discipline that harmonises creativity with rationality. As an art, town planning involves creativity, imagination, aesthetic judgment and value-based choices about how space should look and feel. As a science, it relies on systematic observation, data analysis and technical methods to understand spatial patterns, forecast growth and guide efficient land use. From this again, while art brings meaning and life to the built environment, science provides the foundation for order and function. Together, they enable the planner to envision spaces that are not only efficient but also inspiring, reflecting (cultural) identity, fostering social interaction and promoting a sense of beauty and belonging.

It should be noted that Town Planning as a profession emerged as a response to the social, economic and most importantly the environmental health problems created by the Industrial Revolution of the 18th Century. I also want the audience to note that while the profession emerged as a reaction to environmental problems, the pursuit of Urban and Regional Planning as an academic program by many students and indeed by many great professionals today, was also a reaction to their inability to gain admission into their first-choice courses. My own story was different. Urban and Regional Planning was my course of first choice to be studied in a university, where it was first mounted in Nigeria at the University level - University of Ife, thus, I became one of the fourth set of students admitted to study Town and Regional Planning at the then University of Ife now Obafemi Awolowo University.

My journey at OAU began 45 years ago. URP was then part of the five divisions within the Department of Environmental Planning, Design and Management in the Faculty of Technology. I graduated in 1985 and returned in 1993 for my postgraduate studies. By the time I completed my M.Sc in 1998, my intention was to write my Ph.D thesis/research on Regional Planning, focusing on livelihood inequalities in the Oke-Ogun Axis of Oyo State. However, financial consideration led me to change to a project where data collection was to be in phases (that is, over months, in one year), to enable me to spread my financial budget over considerable period. Today, I stand before you to submit that the change from Regional Development Planning to Environmental Management (with emphasis on Solid Waste Management) proved highly beneficial. The change linked me to other fields that impinge on human life such as environmental engineering, public health, environmental health and environmental education. Though my choice was somehow accidental, my desire to understand livelihood inequalities became more realistic through what I finally settled for at the doctoral level.

I found environmental management engaging and practical. A cursory glance of Nigeria's urban environment shows plethora of problems. These problems include but are not limited to poor infrastructure delivery, crime, poor sanitation, juvenile delinquencies, inadequate housing, traffic congestion, poor urban legibility and comprehension and of no less in magnitude and importance is, the challenge of solid waste management. Over the years in my career as a Town Planner - teacher, researcher, consultant and administrator, I have paid incisive and diligent attention to these challenges. My academic journey reinforced that managing the urban environment successfully, especially regarding solid waste, goes beyond the responsibilities of government and its agencies activities but also include the active participation of the governed.

Although my academic career began in the Department of Urban and Regional Planning, Ladoko Akintola University of Technology, Ogbomoso, in 1992 as a Graduate Assistant, my career at Ife has been particularly rewarding and fulfilling. I joined the Department of Urban and Regional Planning, Obafemi Awolowo University, as a Lecturer II and rose through the ranks to become a Professor. At first, I was hesitant to accept the position at OAU, since I already held the same rank at LAUTECH. It took the wise counsel of Late Prof. L. O. Olajuyin and Prof. I. A. Okewole (my M.Sc and Ph.D supervisor) to persuade me to make the move. Today, that decision has proved profoundly rewarding as I stand before you to deliver the 410th Inaugural Lecture Series of the Obafemi Awolowo University, Ile-Ife, Nigeria. This is the third lecture of its kind from the Department and the first to be delivered by a fully fledged alumnus of the Department. The first was presented by Professor S. O. Fadare in 2010 and the second by Professor L. M. Olayiwola, in 2012.

While I consider it a great privilege to stand before this distinguished audience to present my academic stewardship, it is more fitting to look beyond the rhetoric of my professional journey and turn the mirror toward the deeper questions that frame the focus of this lecture: *Who are we* in the urban space? *Where are we* in the management of our environment? And *where should we be* as a people striving for liveable and sustainable cities? I invite you to patiently follow me as I share my reflections and findings on the theory and practice of urban environmental management in Nigeria.

WHO ARE WE?

One may wonder what answer this lecture will provide to the profound question: *Who are we?* We are urban residents! At first glance, this may seem simple, yet it carries significance far beyond geography or demography. To claim the identity of urban residents is to acknowledge not only where we live but also the forces that shape our daily lived experiences, choices and aspirations. Saying *we are urban residents* is both a description of where we dwell and a recognition of the dynamic relationship between our environment and our identity: the city shapes us, and we shape the city. To appreciate this fully, it is imperative to pause and define *urban*, a term whose meaning varies across disciplines and purposes.

Balchin and Kieve (1982) define urban settlement technically, emphasizing high population density, extensive built-up areas and a predominance of non-agricultural functions. More broadly, urban areas are characterised by shared land coverage, economic activities, social settings, population size and density (Week, 2010). For instance, across West Africa, the population threshold for classifying urban settlements vary. In Ghana, Liberia and Benin, settlements with populations of 5,000, 2,000, and 10,000 or more are considered urban, whereas in Nigeria, settlements of at least 20,000 people, as well as all Local Government Area Headquarters and State capitals are designated urban (Ofem, 2012; Fox *et al.*, 2018; Potts, 2018). In this region, many urban areas emerged through the process of rural transformation, natural population growth and peri-urbanization. Urban centres are thus hubs of enormous political, social, economic and cultural importance to the countries in which they are located and in international arena.

The urban environment is the home of man, an engine of economic growth, a centre of employment and a space of opportunity (UN-Habitat, 2016; Pacione, 2009). It encompasses the physical infrastructure such as buildings, roads, parks, utilities as well as social, economic and institutional systems that shape daily life and human interactions. Characterized by dense populations, diverse activities and constant change, the urban environment is shaped by residents, and it shapes residents in return. The character and status of urban environment, thus connote that any problem that threatens the well-being of man in the urban space threatens all other spheres of life.

As a result of the above functions performed by urban centres in different economics of the world, they have become the focus of research for quite a numerous and diverse disciplines. In Urban and Regional Planning, Environmental Management has become an area of focus both in the developed and developing economics. Environmental Management is the systematic process of regulating the impact of human activities on the environment to protect and conserve natural resources, minimise pollution and promote sustainable development. It involves developing strategies to reduce negative environmental impacts like waste reduction and resource conservation, to create condition for conducive human healthy living.

The concept of environmental management is general and theoretical and is devoid of the actual practice of managing the urban environment. The concept of environmental management as used in this lecture and related to urban centres is the actual efforts, methods, practices and finance committed to prevent pollution in urban centre and make its environment conducive to human healthy living. In essence, urban environment management is a deliberate and practical attempts

to making the environment lively to urban residents in a sustainable manner. In the management of urban environment, issues involved include: the control of urban sprawl, inner-city decay, inadequate housing, unemployment, poverty, flood and fire disaster. Others are crime, street children menace, juvenile delinquency and filthy environment because of poor management of solid waste. In this lecture, I have focussed much on my area of specialisation: SOLID WASTE MANEGEMENT.

Waste according to Gilpin (1996: 228) is,

"any matter whether liquid, solid, gaseous or radioactive which is discharged, emitted or deposited in the environment in such volume, concentration, constituency or manner as to cause a significant alteration of the environment. It embraces all unwanted and economically unusable by-product or residuals at any given place, time and any matter that may be discharged accidentally or other use of the environment."

From the above definition, four types of waste by physical properties are discernible. These are liquid, solid, gaseous and radioactive. Since radioactive is not as common in the developing world, waste to be managed in the urban environment is categorised into three: solid, liquid and gaseous. Of these three, the most obvious is solid waste.

Having laid the above theoretical foundation, I now return to the question of who urban residents are, which is better explained by the three land use theories postulated by Burgess (1925), Hoyt (1939) and Haris and Ullman (1945). These three classical theories did not only identify three categories of urban dwellers based on income (low, medium and high) but also documented that these different income earner groups occupied three distinct residential zones. Each of these three different residential zones further has its own physical attributes as determined by the socio-economic characteristics of which income, occupation, religion, culture and education are of paramount importance. In essence, who we are determines the physical environment in which we live as well as how the environment is managed.

The works of Akorede (1975), Adedibu (1988) and Afon (2005) as examples in Nigeria do not only identify three categories of urban residents in terms of their income but also recognised three corresponding types of residential areas based on quality. These are low, medium and high-quality residential areas. The first stratum of low-quality residential area is built up before colonisation. This area comprises first migrant settlers (Mabogunje, 1968). The area is characterised by low standard of physical characteristics in terms of construction, layout and available facilities. These are in addition to low rent paid by tenants where the houses are not occupied by landlords. This area is also referred to as the "traditional" or the "core" residential zone of urban centres (See Afon 1988; 2000; 2006; 2008). Majority of those living in traditional cities such as Ibadan, Iwo, Ilorin, Kano, Abeokuta, Ogbomoso are indigenous and early settlers.

The medium-quality residential areas are built and planned after the establishment of British colonial rule in the country. The district developed due to the pressure of the need to house growing middle income grade residents. Majority of residents here were employed in the formal sector of the urban environment (Onokerhoraye & Omuta, 1986). The housing types in this area

contrast with the low-quality residential area. Walls are made of cement and block and housing density per hectare is between 18 and 22. The socio-economic characteristics of residents differ from the low-quality residential area. Ethnic composition of the population is more varied. Across the country, a significant number of middle- and upper-income group still reside in this area (Badiora, 2016; Faniran, 2016; Adebara, 2021).

The high-quality area is characterised by well planned layouts. The ethnic composition is quite heterogenous. In addition to high socio-economic status and low population density, accessibility to government land services is very high. The high-quality residential area is usually developed by a deliberate act of urbanisation. The area usually houses the well-to-do and mostly educated.

It can then be summarised that, we are different people of diverse socio-economic background, residing in different residential areas of urban environment. The socio-economic characteristics that is somehow homogenous is distinct in every residential environment and at the same time heterogenous in the aggregated urban environment is thus responsible for the environment created as well as how issues emanating from day-to-day interactions with the environment is managed, hence, the management of urban environment crises created is determined by who we are.

WHERE ARE WE?

The answer to this question goes beyond the specific location occupied by individuals in the urban setting. To start with, where we are in relation to the management of urban environment is about what we do as who we are. More specific here, where we are connotes the state of what is done in the different residential areas and in the activities associated with solid waste management and other urban environment management.

Suffice to say that solid waste management (SWM) is not only comprehensively integrated, but also a rational systems approach aimed at achieving and maintaining an acceptable quality of the environment (Gilpin, 1996). SWM is the effective practice and systemic control of solid waste generation, storage, collection, sorting, quantity reduction (recycling), transportation and eventual disposal in a sanitary manner. Likewise, for any solid waste management to be sustainable, it should include financial planning and cost recovery. It encompasses all the activities undertaken or required to minimise the impact of solid waste on health, the environment, the economy and aesthetics (UN-Habitat, 2010). It also involves the adoption of appropriate technological options designed to meet varying needs. According to White *et al.* (1997), activities in SWM must be operated at a cost acceptable to the community, which may include private citizens, businesses and government.

As a result of who we are, Rushbrook and Pugh (1999) identified seven types of solid waste to be managed in an urban environment, based on sources. These are:

Domestic (Residential) Waste: Waste from these sources are products from household activities such as food preparation, sweeping and cleaning, garden waste, old clothing, abandoned equipment, paper, plastic, metal, glass and packaging materials among others.

Commercial Waste: These may be from commercial outlets like shops, offices, restaurant and hotels. Waste components from these sources may resemble those from the domestic sources.

Institutional Waste: Waste from these sources is produced in establishments such as hospitals, schools, military bases and religious buildings.

Street Sweepings: Street cleaning exercise as a source of waste produces solid waste components like dust and soil with varying amounts of paper, metal, packaging materials or boxes and nylons, dead animals and animal dung.

Construction and Demolition Waste: Solid waste from this source include soil, stone, wood, bricks, reinforced concrete and ceramic materials.

Sanitation Waste: This will include materials brought out from drainages and gutters especially during (periodical: daily, weekly and/or monthly) environmental sanitation exercise.

Industrial Waste: Solid Waste composition from this source depends on the types of industrial activities generating them.

Having listed the various types of solid waste in urban environment based on sources, it is expedient at this juncture to examine where we are in the different activities of solid waste management in developing countries in general and Nigeria in particular.

Generation

It is long established that a major handicap to effective SWM in the close to lack of reliable statistics on the quantity of solid waste to be managed in the urban environment of Nigerian cities on daily, weekly, monthly and yearly bases (Omuta, 1987; World Health Organization, 1976). The basis of SWM problems in cities is urbanisation. While it is not only unrealistic to ever think of stopping urbanisation, it also seems impossible to do so. It should therefore be recognised that as cities grow in population, quantity of solid waste generated and to be managed increases, and the composition become more varied and consequently, more complex.

The availability of adequate and reliable statistics on the quantity and characteristics of waste to be managed in known to have the following benefits:

- a. the optimum collection systems and vehicles are selected with certainty;
- b. the total and different cadre of workforce to be employed are reliably ascertained;
- c. the quantities, characteristics and densities of solid waste generated in each city in general and in the different residential zones in particular are very helpful in having a through knowledge on the degradable and non-degradable, organic and non-organic and combustible and non-combustible proportions;
- d. the solid waste management board and/or agency will be equipped with information concerning the quantum of land to be acquired as sites for SWM (UN-Habitat, 2010; Afon, 2008, 2005).

Of importance in the needed statistics in solid waste generation is the daily per capita production. This is the figure an individual will produce per day. At present in Nigeria, the statistics available on this is not reliable. This multiplier is very useful in estimating the daily quantity of solid waste to be generated in a settlement upon having the knowledge of the population. It should be emphasised that no reliable national per capita solid waste generation figure exists for the country. Often, figures used to estimate the quantity of solid waste generation were those suggested by the World Bank and other international agencies. These were figures not backed by household surveys. The works of Afon (2005, 2007, 2008), Afon and Okewole (2007) based on the survey of 1,933 households in three settlements of Oyo State (Ogbomoso, Oyo and Saki)

conclude that the daily per capita generation is 0.129kg. This figure cannot be taken as a national figure but more reliable than the exaggerated 0.60kg put forward by the World Bank for developing countries. In essence, the daily quantity of waste generation in Nigerian cities is better estimated using the figure of 0.129kg established in our studies.

Conclusion is reached on quantity of solid waste generation in Nigeria that:

solid waste generation increases with size, solid waste generation increased directly with city population density

But: the average per capita generation decreases as the number of persons in a household increase, the average per capital generation decreases as the population of cities increase.

In Nigeria, several factors have identified to influence the quantity and composition of solid waste generation. The factors showcase who we are (income, occupation, social status, educational status, occupation, educational qualification and household size), season of the year (rainy or dry and the associated agricultural products), changing eating habits as well as available legal and regulatory instruments. Furthermore, the development changes of use-once-and-discard materials also increased the quantity of solid waste produced in our urban areas.

Another characteristic of where we are in solid waste generation is that what could be produced in the urban centres are not regulated. In other words, every urban resident is free to generate whatever component desired. The implications of this are obvious in urban environment management:

- a. wide variation exists in the compositions of solid waste generated during the different season of the year since there is no restriction on what could be brought into the cities as solid waste.
- b. Waste component that has no economic value such as maize husks, banana peels among many others are produced and are disposed on incidental open spaces in the different residential zones of the city.
- c. Industrial establishment, since they are not guided are also not immune from contributing to urban environment management problems. This is using plastics bottles, nylon and polythene materials as container and wrappers of the industrial products.

Despite the importance of accurate statistics in estimating the quantity of solid waste generation in urban setting, arriving at a useful figure is very difficult. It has been documented that estimations would either be under-estimated and/or over-estimated. It is recorded that waste available for collection may be less than the quantity generated by households for a few reasons. These include some of the food waste is fed to animals while some decompose as organic waste; evaporation of moisture during storage, burning of waste for fuel and disposal, selling of reusable materials and items to itinerant waste buyers, waste picking at the communal containers, scattering of waste by animals and waste scavengers and blowing of waste by the wind.

Where we are in urban solid waste generation has serious implications on where we are in solid waste storage at both the household and community levels. It thus becomes imperative to examine this as an activity in solid waste management.

Storage

Storing waste properly while awaiting collection is of utmost importance. This is to prevent unsightliness and/or attract vermin. At the household and community level, not storing waste properly will affect the public health negatively. To forestall improper solid waste storage, the Local Government is responsible for defining standards for proper storage and enforcing these standards in the advanced countries of the world. It is usually homeowner's responsibility to supply enough containers for their solid waste and keep them in good condition (USEPA, 1971). Local Government Authority however supplies solid waste storage receptacles in public places like motor parks, bus stops and shopping centres among others. This is the scenario in the developed world.

In the developing countries however, no laid down standards for the provision of storage containers exist (Oluwadare, 1983). As a result, all sorts of containers are used as waste storage receptacle. These practices constitute health hazards to both the generators and the solid waste management workers. For effective waste management, Oluwadare (1983) suggested that materials to be used as household solid waste storage bin should be durable, light and preferably watertight, resistant to corrosion, of adequate capacity, easy to empty and clean and with fly-proof cover. It should not also be accessible to vermin. To be of adequate capacity depends on three important factors. These are (a) number of people to use it, (b) method of solid waste collection (whether to be carried by children, adult or local government manually or mechanically) and (c) period between collection and emptying.

Mr. Vice Chancellor Sir, in some of my research works (Afon, 2005, 2008; Faniran, *et al.*, 2017), it has been established that households employed a combination of methods for storing waste; the waste receptacles were provided by individual household; and waste storage receptacles adopted were not environment friendly. Characteristics of the materials used for storing waste were not the like the characteristics suggested by Oluwadare (1983). These materials include basket, paper carton, sack, metal drum with and without cover, worn-out bucket and basket and nylon and polyethene bag. The studies showed that the use of receptacles that constitute less environmental hazard was predominant in the sub-urban zone than in the core. On the other hand, storage materials utilized by larger proportion of households in the core residential zone were largely environment unfriendly. Impliedly, there were variation in solid waste storage practice in urban area, although, irrespective of the differences in income, household size, educational and occupational status of residents, every household used non-environment friendly solid waste storage receptacles.

In other studies (Afon, 2005, 2010) Multinomial Logistics Regression was used to determine the choice of solid waste storage receptacle. The storage receptacles were the dependent variables while who we are in terms of residential density, types of houses occupied, educational status, occupation, income group and household size were the predictors. The conclusion from these studies on three towns through Exp (Beta) was that the likelihood of using environmentally unfriendly storage receptacles inversely varied significantly with educational and income status

but directly varied with residential density. The use of Local Government solid waste storage bin was however on the increase as distance increased from the core area towards the suburban. The household size was found not to have significant effect on the choice of storage receptacles.

Collection and Transportation

The collection system is influenced by storage method, pick up point requirement, kind of solid waste and equipment, labour availability and cost (USEPA, 1971). In terms of cost, Oluwadare (1983) concluded that refuse collection and transportation are not only the most difficult aspect of solid waste management, but also the most expensive. Sometimes, it takes as much as eighty (80) percent of the total cost of solid waste management.

Mr. Vice Chancellor Sir, ladies and gentlemen, I want to let us know that solid waste collection and transportation are a big problem in developing countries like Nigeria. These activities no longer pose a serious problem in the developed part of the world. This is because almost all houses are accessible to roads. The solid waste vehicle moves from house-to-house to empty waste storage receptacles. The nature of city arrangement in a country like Nigeria makes the above practice difficult if not impracticable in some residential zones. There exist a good number of pre-colonial cities where the characteristics of some residential portion include lack or difficulty of physical access to most of the buildings and motorable road (Akpovi, 1981, 1983; Omuta, 1982; Afon, 1998, 2006, 2006a). Residents of such areas of cities have no alternative but to physically dispose their waste in central depots. In several instances, many traditional residential neighbourhoods are not with depots. Indeed, the distance that may have to be walked to reach such refuse depots (if there is any) may be discouraging. All these promote indiscriminate dumping of waste.

The aspect of traffic congestion is also a serious problem especially in large urban centres such as Lagos, Ibadan, Kano, Enugu, Kaduna and Onitsha. This restricts the number of trips the collection vehicle/crew can make per day and ultimately further reduces their efficiency and increase cost. This assertion was confirmed in our study (Afon *et al.*, 2025) when we investigated the collection and transportation activities of solid waste private sector participants (PSP) in Lagos, Nigeria. The study showed that 58.0% of the PSP operators made a trip per day to dumpsites, due largely to the traffic situation of the city. In an earlier study on solid waste management during monthly environmental sanitation exercise in Ibadan Municipality (Faniran *et al.*, 2017) we established that none of the dump site was located less 10 km to the city centre. As a result, it was difficult to make more than a trip within the period of the exercise by government waste vans and those hired for the exercise by the Ibadan Solid Waste Management Authority and the respective Ibadan Local Government Council. With this situation, solid waste emanating from the exercise were usually left uncollected, many hours and some cases days, after the exercise. This notwithstanding huge amount of money spent on the hiring of vehicles for solid waste collection.

To avoid traffic congestion during the day, solid waste may be collected and transported during the night (USDHEW, Bureau of Solid Waste management, 1969). This is practicable and already in practice in American cities. However, where we are particularly in Nigeria and other developing countries in general is faced with several challenges that make the practice very close to being impossible. These include that: collection vehicle can be noisy especially if not well

maintained. Resident may thus, object to collection operation that disrupt their sleep at night; collection of solid waste can be dangerous at night where there is no adequate lighting, a feature of Nigerian urban centres; female workers will not be courageous to be on duty at night because of embarrassment and all sort of insecurity; collection at night may require workers on disposal sites to be on duty which would require adequate lighting of the site; site managers may be needed at both day and night; the risks of accidents occurring may be higher in the night especially in terms of insect stings and snake bite among others, especially if pickers are sorting through the freshly dumped waste; and supervision may be less effective.

The important factors to consider in solid waste collection and transportation activities are the: quantity and composition of waste to be collected, methods of disposal and site availability (extent and distance). Others include types of vehicles and equipment available, variation in solid waste generation rate, physical layout of the community in question, climatic condition, collection crew organization and types of residential zoning.

From the forgoing, the characteristics of where are we in solid waste collection and transportation in Nigeria include: there is hardly stipulated time of collection (time of the day, day of the week, frequency of collection), hence the collection crew are at work as deemed fit; collection vehicles are obsolete and indeed many of the Local Government, who are constitutionally responsible for solid waste management, do not have serviceable vehicles; the serviceable vehicles in many cases often carry small loads frequently less than half their potentials payloads because their bodies are inappropriate. Maintaining the vehicles have been burdensome as technical crew to do this lacks the technological knowhow. As far back as 2005, it was established that, before the **compactor** would be repaired, experts must be sourced from outside the country. To do this, there must be at least 20 vehicles (1 per local government) to be repaired before inviting the mechanical engineer (Afon, 2005).

Disposal

The ultimate step in a management system of solid waste is disposal. In the more advanced technologies, disposal is preceded by some engineering activities such as separation and quantity reduction. Separation is done in order to sort out materials that can be turned into some economic value. In Nigeria most especially, waste is not sorted at the household level except by those engaging in informal activities like the scavengers (Afon, 2007a, 2012; Afon & Faniran, 2011).

Several methods of disposing solid waste exist. The choice of any method depends on a number of factors. These include the:

- (i) characteristics of the waste to be disposed;
- (ii) cost consideration (that is, how much is available and how much could the method cost);
- (iii) availability of disposal site (cost of land for example)
- (iv) cost of labour; and
- (v) technical implication of the methods.

Any community whether in the advanced or less developed countries is opened to choose among the following options of solid waste disposal methods

- (i) converting/recycling
- (ii) sorting and salvaging

- (iii) open dump
- (iv) controlled tipping/sanitary landfill/daily burying
- (v) composting
- (vi) incineration
- (vii) disposal into the sea (Eerd, 1997; Johannessen & Boyer, 1999).

The open dump method of solid waste disposal is considered as both naive and dangerous (Rushbrook & Pugh, 1999). This is because the leachate effect (that is, the chemical and biological contaminants in waste) will constitute a direct risk to human health. Though, very cheap and easy, it is in the long run the costliest. Johannessen and Boyer (1999) observed that it remains the predominant means of solid waste disposal in developing countries, Nigeria inclusive. The work of Afon (2008a) while documenting the intra-urban differentials in solid waste disposal practices in Ogbomoso, Nigeria concluded that, the socio-economic characteristics of residents did not only influence the disposal method of waste, the methods employed are environment-unfriendly, cheap but very costly as they constitute threats to public and environmental health.

It is imperative to examine these methods that are still very popular in our cities. These methods include:

- (a) **Designated open space:** This is a form of legal open waste dump that emerged from three major sources.
 - (i) it could have been designated by paramount rulers and chiefs of the neighbourhood.
 - (ii) community members could also designate a place as dumpsite
 - (iii) at times, it developed from illegal dump, but being operated for a number of years, it became acceptable to residents of the neighbourhood.

Designated open dump is very common in the traditional residential zone and its presence is on the decline as distance is increasing from the core residential zone to the sub-urban.

- (b) **Burning:** This method of disposal is adopted any time that combustion can easily take place. Its adoption is determined by the components that should be combustible and availability of enough air space between buildings that will not cause fire hazards. Waste could also be burnt along major roads and inside drains.
- (c) **Dumping into the drainage system:** Waste is dumped inside drains along the roads as a means of finally disposing it. This practice is particularly prominent during the rainy season with the notion that it will be washed by rain run-off.
- (d) **River banks:** This method is only possible for residents who are in close proximity to water bodies. The practice was identified to be a popular one in all residential districts where water body exists.
- (e) **Local Government Refuse Van:** A solid waste compressor lorry was in operation in each local government. The lorry was operated occasionally at no financial cost to users.

- (f) **Vacant land:** This method includes dumping waste indiscriminately on vacant building, land and air space between buildings and road setbacks among others. In a simple term, it is an open dump method.
- (g) **Community storage container:** To the government or its agency, the community storage placed at strategic locations in cities is a storage facility. However, to the resident using it, it is a for disposal or a disposal method.
- (h) **Use of dilapidated building:** Other methods in practice till date that are not environment friendly are disposal of solid waste into dilapidated buildings, buildings under construction, abandoned vehicles and on road divide. Others could include road junction, on pedestrian bridge, disposal to fill potholes on roads and pit formed as a result of laterite evacuation.

From the characteristics of the disposal methods adopted in Ogbomoso, typical urban centre in Nigeria, they are very un-environmentally friendly. The adoption of these methods was largely due to unregulated disposal practices and “close to nothing efforts” of the local government charged with the constitutional right to manage waste (Federal Republic of Nigeria, 1999). Where we are now as far as disposal methods are concerned is far from being global and public-health compliant.

Mr. Vice Chancellor Sir, I thought it fits quickly to discuss the 4Rs that shape modern day solid waste management. These are: reduce, reuse, recycle and recover.

The First R: Reduce

This is about generating less waste. This underscores the importance of minimising the amount of waste generated at the household level. This is by consciously choosing to use fewer resources leading to creating less waste. For example, buying recycled products, choosing durable products, using sack instead of using non-reusable plastic bags to keep items. In other words, following the principle of ‘Reduce’ will imply actively participating in decreasing the demand for new product and resources.

This principle can be carried out by considering the following:

- i. choose durable items while buying goods
- ii. use washable containers for lunches
- iii. use sacks instead of using non-reusable plastic bags
- iv. print on both sides of a paper to reduce waste generation
- v. warning signs should be printed on products showing the disposal methods
- vi. buy in bulk to reduce individual packaging
- vii. choose products with minimal or no packaging
- viii. opt for digital document instead of printed ones
- ix. compact kitchen waste to reduce landfill contribution.

The Second R: Reuse

The usage of any product itself without changing its form and composition is called Reuse. It is the act of reclaiming the product by using it for different purposes. This can be done in households and workplaces. Embracing the culture of reuse preserves the environment and its

resources and reduces the demand for new materials. This will alleviate the strain on the ecosystems and reduce waste accumulation in landfills.

The Third R: Recycle

Recycling is the use of solid waste processing and modifying it into another form. This is usually done when it is impossible to reuse and reduce (Sumich, 2023). It was further submitted by Poudel (2024) that many of the items we use daily (paper, glass and metal) can be transformed into new product which keeps valuable materials out of the landfill where they can take hundred or even more to decompose. It is important to note that almost all waste is recyclable. For example, paper can be recycled into egg crate, cardboards, shoe boxes; metals and plastics can be recycled to form new products, as well.

The Fourth R: Recover

Recover pertains to the extraction of value from waste. This value could be in the form of energy, compost and biogas (Sumich, 2023). An example is organic waste like food scraps and garden cuttings can be composted at home to create nutrient rich soil. Some waste components can be used to create electricity energy in waste-to-energy plants (Pondel, 2024; Sumich, 2023).

On the basis of the above of the above, the following conclusions on the 4Rs of solid waste management hierarchy could be drawn. These are that:

- a. when resources are used wisely, it creates less waste and contributes to a cleaner environment
- b. each 'R' offers a different way to manage waste.

Together, they give a comprehensive and complete approach to waste management that anyone can follow. When combined, they provide a complete and comprehensive approach to waste management that not only minimise waste but also maximise the value we get from resources.

Financial planning and cost recovery

There are two basic financial decision to be considered by solid waste management authority and/or government (USEPA, 1971; Afon & Faniran, 2011a). These are: how to finance the capital requirements and meeting the operating expenses. Capital improvement budgeting would cover the following: disposal site equipment, back up equipment, cost of land to be used as disposal site, collection equipment and cost of constructing plants (such as incinerator if need be). On the other hand, operating costs/expenses will include, insurance premium (on equipment and workers), public enlightenment programmes, facility maintenance and repair costs, salaries and fringe benefits of workers, utility and fuel cost.

The extent of financial needs for these two broad considerations is dependent on a number of factors. These are:

- i. type of service to be provided (collection, transportation and disposal)
- ii. level of collection service (once or twice a week; and street or backyard pick up)
- iii. type of consumer to be serviced (agricultural, residential, commercial, industrial, institutional)
- iv. method of processing (sorting, recycling and disposal on site (open dumping, landfill, burying or incinerating))

- v. the qualification and experience of staff employed in the service of solid waste management
- vi. whether service is provided by government, private arrangements or as a combination of both. Where government only monitors the activities of private contractors, the need to purchase capital equipment may or may not arise and recurrent expenses may arise at a minimal level (USEPA, 1971; Collins & Dowens, 1977).

Solid waste management have been said to reflect years of financial neglect (Egunjobi, 1986; Adedibu, 1987). Like any urban infrastructure such as electricity, water and healthcare among others, the case of solid waste management infrastructure financial neglect in the developing countries like Nigeria is obvious. This is reflected in inadequate and lack of equipment (including but not only limited to the refuse vans and lorries), inability to carry out environmental enlightenment campaign programmes to members of the public and lack of enough qualified, experienced and technically skilled manpower among others (Afon, 2005; Afon & Faniran, 2011a; Afon *et al.*, 2025).

We are also at a junction where solid waste management is perceived as a social service, therefore, payment for service should not be made (Afon, 2006). The cost of effectively carrying out solid waste management activities without adequately recovering substantial parts of the costs (or even realising profits) is too much for government and/or her agencies responsible for solid waste management to shoulder.

The practice in Nigeria is unlike that of developed countries. In the developed countries, the cost of providing solid waste management services is ranked with the cost of providing other necessities such as water and electricity (USEPA, 1998). In essence, as consumers pay for water, electricity and gas, they pay in the same manner for the evacuation of solid waste generated in their residential areas. This has made it possible to provide a sustainable urban solid waste infrastructure. This is not so in Nigeria where there is an excess demand on urban infrastructure delivery and incorrect pricing (Onibokun & Aguda, 1991). As a result of poor practice of cost recovery in Nigeria, few scholars have been concerned about how cost incurred on solid waste management activities provided by government and/or boards/authorities could be recovered.

As far back as 1986, Egunjobi was of the opinion that citizens should be involved in paying for the services they enjoy, no matter how small it may be. The methods to be used in the collection of such payment was however not specified, though it was pointed out that “user charges” may be difficult to administer, despite its inherent advantages. In 1983, Adedibu advocated that a fixed amount of money be charged yearly as service cost. In other words, a form of tax was advocated for the delivery of solid waste management services. The problem with this arrangement is that such tax is not fair as everyone irrespective of the quantity and composition of solid waste generated, will pay the same amount of money.

Not long after Adedibu (1983), Omuta (1987) proposed the introduction of “user charges” which is a form of pollution tax. Resulting from high poverty level of tenants especially in the traditional/core residential area (Afon, 1998, 2005, 2006, 2008), it was advocated that landlords should pay such tax. This arrangement will not only go down well with landlords and may lead to upward review of rentals payable by tenants.

Recovering of cost from waste generators has become part of everyday practice in solid waste management in the advanced economies of the world. USEPA (1998), White *et al.* (1997) submitted that cost recovery could include special assessment tax against properties based on the areal extent; income tax as a component of internally generated revenue in Nigeria; and service charges and fees. The most widely used of the above where cost recovery has become a normal practice is the service charges and fees.

Several advantages are associated with the recovery of cost of solid waste management. Onibokun (1997) believed that citizens are being involved in the governance of their urban centres. Such cost recovery also serves as indirect involvement of citizens in guided use of the environment. In particular, White *et al.* (1997) opined that charging according to quantity of waste generation could lead to reduction in household waste production provided an unauthorised dumping could be prevented.

Cost-recovery ventures should be guided by the following factors:

- i. the socio-economic status of solid waste generators;
- ii. the level of confidence the public members have in the services provided by the solid waste management board/authority;
- iii. how convinced citizens are towards living in a clean environment through education; and in general,
- iv. the level of affordability and willingness to pay for privatised waste management services.

To effectively recover cost of managing solid waste from the residents, privatisation is very imperative. Privatisation according to Cointreau-Levine (1994) is the reduction in government activity or ownership within a given service or industry. These can take one of two forms; either government reduces its activity when and where private sector participates in service delivery or government ownership is reduced. The latter can also take two forms: (i) where and when government agencies are divested to unregulated private ownership, and (ii) government agencies are commercialised, that is, reorganised into accountable and financially autonomous semi-private enterprises. In general, where privatisation occurs, the private participants on one hand and government on the other focus two entirely different and extreme perspectives. While the private investors' fundamental concern is whether the delivery of service to finance makes money, the government consideration is whether privatisation policy will save money through private participation vis-a-vis public values.

Several advantages of privatising and recovering costs in urban solid waste management infrastructure delivery have been recognised. These include that

- a. it gives the agency responsible for solid waste management some autonomy. This is so as the need to compete with other government agencies for their share of general revenue is reduced greatly if not completely eliminated;
- b. waste management authority becomes directly accountable to residents (users/customers) for the cost and value of services provided (Kundell *et al.*, 1996), citizens are being involved in the governance of their urban centres (Onibokun, 1977);
- c. it is an indirect involvement of citizens in the management of the environment as a basis for more efficient operation;

- d. charging solid waste management costs change people's attitude to waste and can lead to a fall in generation.

To elicit the interest of private participants to invest in the equity capital in solid waste management infrastructure delivery, both the supply and demand sides of the privatisation must be effective. This scenario presumably, is that the user's willingness to pay (WTP) and affordability to pay (ATP) for the services provided were very high.

Marchand (1998) concluded that if urban solid waste infrastructure delivery will be adequately financed in a sustainable manner and be replicable, a method of eliciting information on the value placed on different levels of services is required. Conclusion is therefore reached that if residents or users of urban solid waste management services are willing to pay for the full costs of a particular service, then it is a clear indication that the service is valued and therefore will most likely be used and maintained; hence, it will be possible to generate funds required to sustain the service.

The Whittington (1998) theoretical classification of residents into groups (see Table 1) was used in a study of Asaba (Afon, 2007b). The study identified some reasons residents were not willing to pay for the cost of solid waste management services (Table 2). Similar study in Ibadan (Makinde, 2016) established that the proportion of residents willing to pay for solid waste costs is 54.8% while those that could afford to pay is 93.5%. We are thus at a point where the problem concerning paying for solid waste management is not that of affordability, rather, it is willingness to pay.

Table 1: The Willingness and Affordability to Pay for a Hypothetical Service or Good: A Theoretical Classification

	Resident willing to pay	Resident not willing to pay
Resident is able to pay	Willing and Able	Able, but not willing
Resident is not able to pay	Willing, but not able	Not willing and not able

Table 2: Reasons Residents would not Want to Pay for the Cost of Solid Waste Management Service

Reason	Percentage
Not considered necessary	21.3
Did not trust government and its agency	19.8
It is the responsibility of the government	18.1
Lack of confidence on the service	16.8
Cannot afford the cost	15.1
Convenient with the present disposal method	8.9
Total	100.0

Informal sector participation

Mr. Vice Chancellor Sir, the informal sector participation in urban solid waste management refers to unregistered, unregulated or casual activities carried out by individuals and/or family

or community enterprises. The emergent of this initiative in solid waste management is a response to either failures of the formal sector or lack of employment or under-employment or all of these. Informal sector participation in solid waste management had taken different dimensions in some third world countries. For example, in Indonesia, the sector hires and manages the neighbourhood workers who provide door-to-door waste collection. The main equipment used in collection is the human driven cart (pushcart). As recorded by USAID (1990), the local leaders collect fees from the residents to fully cover the various kinds of costs.

In Nairobi, Kenya, the informal sector had been in operation for over a long period of time. The outfit disposes and recycles waste. In Egypt, Kamel (2000) document that no formal private sector companies with a strong record exist. The existing informal system is recovering 80% of waste collected. By 1990, two of such informal groups have gained prominence in waste collection, partial sorting and recycling. These are the Ewaahisi and Zabbadeen (Kamel, 2000). Despite, the advantages attributable to the informal sector initiative, a number of negative service conditions associated with the sector's operation have been identified. In the first place, waste may not be sorted and where sorting is carried out, what is not for recovery is left on the street to rot. In many instances, such portion is burnt.

The “barro” boys

Mr. Vice Chancellor Sir, ladies and gentlemen, I herEby report that my research light is also beamed on two important informal sector participants in urban solid waste management. These are the cart pushers, also known as “*barro* boys” and the scavengers (Afon, 2007a; Afon and Faniran, 2011).

The *barro* boys is an informal sector initiative in the primary sub-system of urban solid waste management in Lagos, Nigeria. The name stemmed from the main equipment (wheelbarrow) used in the house-to-house collection of solid waste. The important characteristics of the *barro* boys include that:

- i. a large proportion of the boys (68%) do not have permanent clients. Some of them operated far beyond the boundary of the local government where they were found/sampled;
- ii. they do not have disposal permit. In other words, they are not registered;
- iii. no standard method of charging fees on waste collected;
- iv. the common mode of charging fees is on per visit basis as 84% is on this mode, while only 16% collect fees on weekly basis;
- v. almost all *barro* boys operated from Monday through Saturday, while 76% do not work on Sunday;
- vi. the daily operation of the *barro* boys earned than between ₦12,000 and ₦24,156;
- vii. the cart and wheelbarrow used in their operations could either be owned or rented. While 36% owned their carts, 8% had more than a cart.

Some of the advantages of utilising the *barro* boys are:

- i. their services are needed as when required, as service availability ranked the most important attributes enjoyed by users/clients, from the boys;
- ii. the cost of service is relatively cheap;

- iii. some of the operators are polite in attitude to clients, although many other residents do not feel safe in the hand of the boys.

In general, the initiative plays an important role in the primary sub-system of solid waste management. A cursory glance of the urban environment in Nigeria show that the carts used by the *barro* boys have become a veritable tool in the hands of both scavengers and other informal sector participants in solid waste management.

Scavenging and scavengers' activities

The act of scavenging is not embarked for its sake. According to Medina (1997), scavenging represents an important survival strategy for the poor. The activity upholds the assumption that some economically useful items can still be recovered from solid waste already disposed. Scavenging is an informal recovery of materials that certain depositors had considered to be of no economic value again. The definition and perception of the activity vary from one country to the other. The International Labour Organisation (ILO) (2004) describes scavenging as the manual sorting and picking of recyclable and/or recoverable materials from mixed waste at legal and illegal landfills, dump sites, open dump on street, transfer points and waste collection points. From the above perception, in the developed and developing countries, scavenging as an activity is termed legal and illegal on the basis of the level of success recorded in urban solid waste management. In Nigeria, scavenging is neither legal nor illegal (Afon & Faniran 2011).

Scavenging has taken different dimensions especially in the developing countries. These range from collection from recovering of materials considered to be of economic value for recycling or direct sale to those who are in need (Karuga, 1993; van de Klendast & Lardinois, 1999; Kamel, 2000; Medina, 2006; Rathana, 2009). Scavenging is observed to have developed from a number of reasons; the most being economic. For example, it is documented that scavenging in developing countries is caused by chronic poverty occasioned by high unemployment (Medina, 1998; ILO, 2004). Muktar (2007) noted specifically that scavengers in Kano, Nigeria are poor relative to the rest of the society with very low income. From this submission, scavenging represents an adaptive response to chronic poverty. Other reasons why people took to scavenging is the unbridled access to household bins where materials thought to be of economic value can be recovered. The existence of open dumpsites (legal and/or illegal) where the activity can take place encourages people to scavenge (Johannessen & Boye, 1999).

In another perspective, the fact that scavengers produce goods and services that industrialist and middlemen would want to buy (Medina, 1997, 2006) is also responsible for people to continue scavenging. It is also evident that the activity does not require formal education (Dada *et al.*, 2022; Taiwo *et al.*, 2022; Faniran *et al.*, 2025). Thus, it is easy to enter into the operation with no formal education qualification or with the least rudiment of skill possessed. At the government level is the view that government unfavourable policies towards the youth in most of the developing nations have compelled them to scavenge refuse, as a source of livelihood. Lack of parental care may also be adduced as the reason youth especially take to scavenging.

Public policies towards scavenging and its operators vary from one country to another across the globe. The policies are determined by the perception held of the activity as well as the need to minimise the risks to human health and the environment from how waste disposal is handled. Four major policies towards scavenging have been identified. First is the policy of repression.

This is a policy that sees scavenging as inhuman, symbol of backwardness and a source of embarrassment and shame for the city and/or country (Medina, 1999). The country and general public thus treat scavengers as criminals and outcasts. The ILO (2004) concluded that scavengers are seen as social problems that government department should deal with. For example, countries like Columbia, India and Philippine declared scavenging as illegal, thus scavengers were restricted while hostilities raised against them (Riredy, 1984; keyes, 1987; Gonzalles *et al.*, 1993). A good example of repression policy against scavengers in Egypt was when Cairo authorities banned the donkey carts where the Zabbalen transport waste in the street between sunrise and sunset (Meyar, 1987).

The second public policy is termed neglect. In this case, authorities simply ignore scavengers and their operations. They are neither persecuted nor helped. Waas (1990), Diallo *et al.* (1990) and Tonon (1990) opined that the policy of neglect was adopted in cities like Dakar (Senegal), Bamako (Mali) and Cotonou (Benin). Collusion is another policy that can be adopted against scavenging and scavengers. This is where and when government officials develop relationship of exploitations and of mutual profit and assistance with the scavengers. Medina (1977) termed this relationship as that of political clientelism. Castillo (1990) reported that legal and illegal relationships developed between scavengers and government authorities over a long period in Mexico, resulted into the most powerful scavenger boss became Deputy Representative in the Mexican Congress in the mid-1980s. Scavengers also do give bribes to government officials and distinguishing themselves as peasants and workers in official parades beaten up anti-government demonstrators.

Stimulation as another public policy evolves as a recognition of economic, social and environmental benefits of scavenging and recycling. Therefore, some government started to change previous attitude of repression, indifference or intolerance to one of active support. Medina (1987) observed that stimulation policies range from legalisation of scavenging activities encouraging the formation of scavengers' cooperation (Indonesia); the awarding of contract for collection of mixed waste and/or recyclable (in some Colombian towns), to the formation of public-private partnership between local authorities and scavengers as found in some Brazilian towns.

The works of Afon (2011, 2012) and Adewunmi (2017) confirmed that the policy of government on scavengers in Nigeria is that of neglect. Moreover, in these studies, six groups of informal sector operators in solid waste management were identified. These are, the on-site scavengers, itinerant scavengers (those moving from one area of the city to others), house-to-house waste collectors (the *barro* boys), itinerant waste buyers, recyclers and wholesalers. The public policy adopted in any country may be determined by the social, economic, health and environmental implications of scavengers and scavenging activities. For example, it is conceived in many countries that scavenging activity is labour intensive, utilises low technology and lowly-paid activities. It is also a source of cheap raw materials for industries. It can be easily learnt and does not require literacy in formal education; waste pickers are often recruited by waste trades who offer loans or even accommodation (van Eerd, 1996; Furedy, 1997). The scavengers are poor; they suffer from hard labour condition especially when working on landfills and dumpsites. They also live in very poor conditions and suffer stigmatization and exploitation because handling

waste materials is disdained by the society at large. Scavengers are also observed to be migrants who came from other cities or areas from which they might have fled because of droughts, flood, losing husband or wife. In some countries, scavengers belong to the minority group. This can be religious minorities. For example, it is recorded by ILO (2004) that in Egypt, the Coptic Christians used to make the majority of these scavengers. In Calcutta, India, the Muslim minority is overrepresented among the scavengers.

Mr. Vice Chancellor Sir, let me put on record that hazard and problems faced by third world scavengers are diverse and many (Dada *et al.*, 2022; Faniran *et al.*, 2025). These include, as a result of daily contact with garbage, they are associated with dirt, disease, squalor and perceived as nuisance; they operate in hostile physical and social environment. Scavenging poses high health risk to individuals engaging in it and to the public.

van Eerd (1996) provided six-way classification of hazards and risks to which scavengers are exposed. First is the occupational accident. This includes injuries like cuts. Second is the physical risk caused by working under all sorts of weather conditions exemplified by general weakness, collapsing and exploding waste mountains. The third group is chemical risks. This involves inhaling toxic gasses on site during scavenging activity. Fourth is psychological, among which are low self-esteem, hallucinations and sexual harassment of female waste pickers. Biological risk is another hazard group. It is recorded that many waste pickers suffer from intestinal protozoa, helminth, eye infections, skin diseases, diarrhea, HIV/AIDS arising from health care waste. The general hazard is the sixth group. This consists of bites from rats, dogs and snakes, stings from insects such as scorpions. In addition to all these is the violence conflicts between different and syndicate groups operating on waste dump sites.

The status of where we are in other areas of urban environment management cannot also be said to be conducive for human healthy living. Some of these areas I had researched and supervised students at both the M.Sc and Ph.D levels include:

- a. Crime, Violent Conflicts and Urban Security Service Delivery: The works of Afon (2001), Badiora (2012, 2016), Badiora and Afon (2013) concluded that the management of crime in the different residential zones of Nigerian traditional cities is far from the status where residents can sleep with eyes closed. Urban residents still live in prisons created by them, all in the name of response to fear of crime. Ojewale (2021) while focusing on community resilience to violent conflicts in the North Central Nigeria submitted that individual has to cooperate, mitigate, adapt, cope, sustain and secured their communities in the best way known to them rather than relying on security apparatus provided by the government and its agencies. The study of Ayanwole (2018) and Oladunni (2024) concluded that urban security service delivery was majorly in the hand of the non-state security outfits. This is a pointer to the fact that security service delivery is yet to be properly coordinated.
- b. Begging, Street Children's and Homelessness: A cursory glance of the urban environment showed that the problems of begging, beggars, delinquency and homelessness still rear their ugly heads and are yet to be handled with the care they deserved. Studies by Afon and Badiora (2013), Afon and Taiwo (2016), Taiwo (2014, 2018), Afon and Taiwo (2020), Olajide (2024), Olajide *et al.* (2025, 2025a) are pointers

to the fact that these phenomena are yet to be overcome in the urban centres of Nigeria. Indeed, conclusion is reached that conscious and deliberate efforts to reduce these problems to the barest minimum are yet to be designed and administered by the various urban administrators.

- c. The management of solid waste in other land-uses of Nigerian urban environment: Solid waste management research on land-uses such as healthcare (Afolabi, 2016; Akinpelu, 2019; Adedigba *et al.*, 2010; Ojuolape, 2015; Ojuolape & Afon, 2016; Ebehimare, 20XX), Markets (Fawole, 2012), Beaches (Afon, 2010; Bolukale, 2017, 2022), Institutions of higher learning (Adeniyi, 2019, 2022), street cleaning exercise (Okanlawon *et al.*, 2009) refuge camp (Afon *et al.*, 2010) and abattoir (Fadare & Afon, 2011), have also been carried out. Various findings on these land-uses indicated that the management of solid waste emanating from them are not environment friendly. cursory glance of each of these land-uses would show this.
- d. Environmental Psychology Studies: Efforts were also put in place to study some environmental psychological issues. These issues include residents' perception of property rating (Afon, 2006), residents' willingness and affordability to pay for privatised solid waste management service (Afon, 2007b; Makinde, 2016), residents' perception of development control agencies (Afon, 2009), the perception of environmental hazards and risks (Afon *et al.*, 2006; Afon, 2011; Nwakwo, 2012), sanitation exercise (Faniran, 2012; Afon & Faniran, 2013; Afon *et al.*, 2008). Other studies related to environmental psychology are on residents' neighbourhood confidence, sense of place and place attachment (Faniran, 2016; Faniran & Afon, 2017; Ojo *et al.*, 2017; Ajayi, 2024) and open space utilisation (Afon & Adebara, 2019). The confidence expressed by residents in the various urban studies based on their perception do not lead to a reasonably healthy living but only produced low quality of life (Oluwadare, 2015; Ojo, 2019; Afon & Ojo, 2016, 2016a).

Mr. Vice Chancellor Sir, it is imperative at this point to address where we should be in the various issues raised in the different sections of the lecture.

WHERE SHOULD WE BE?

Evolving a sustainable urban solid waste management requires concerted efforts of having adequate and current information on quantity and composition of waste production, adequate funding of the storage facility at the household and communal levels, collection and transportation. And of importance, financial planning and cost recovery policies that would require a deliberate and conscious efforts of government at the three tiers. We should recall that the most important activities in urban solid waste management are local government responsibilities. Section 7 (i) (h) of the 1999 Constitution of Nigeria (Fourth Schedule) states that the local government is responsible for the provision and maintenance of public convenience and refuse disposal.

The question we should ask is "what is the autonomous status of the local government in actual practice?" What is the level of financial autonomy and capacity of this tier of government. The answers to these questions are that the local councils are only politically in existence but with

very little autonomy and poor financial capacity to actually carry out the enormous task of managing solid waste produced in our urban centres. Effective and sustainable solid waste management can only evolve through the local government councils' administration. To achieve this, the following are recommended.

Key Function of Local Government and Administrative Restructuring

It is suggested that our local government **MUST** perform some key function for effective solid waste management.

- i. Policy making: Making policy/policies on solid waste management rests with elected officials. This may however be delegated to departments. Policy decisions that are major in terms of the final choice of disposal method(s), means of financing, managing solid waste in contiguous local government area would have to be made.
- ii. Public information: Keeping citizens aware of what constitutes appropriate solid waste management is important. There is the need to educate on expected attitudinal and financial expectation from the citizens.
- iii. Budgeting: The local government administration must be empowered to provide adequate funds for items such as competitive salaries, training, equipment (purchase and maintenance), site acquisition and maintenance.
- iv. Planning and review: To develop a comprehensive solid waste management system, plans must be formulated in areas like preliminary fact findings (environmental and physical condition of city); solid waste generation (may include survey and inventory of waste as to quantity and characteristics), decisions and actions on engineering issues. A review of information is needed to keep the programme up to date.
- v. Drafting, adoption and enforcement of standards: These may emerge from general statements made by the federal and state government. To be included are: decision on storage, materials based on customs and economic capacity of residents, prohibition of open burning and dumps, provision of remedies and penalties prescription.
- vi. Operation of the system: The issues concerned in this regard may include solid waste storage, collection, transfer, salvage, quantity reduction and disposal. The local government administration must also decide whether collection, transportation and/or disposal will be performed by private operators or by itself. Whatever the practice, the local government must still control the operations.

Mr. Vice Chancellor Sir, it is expedient to submit here that the actual solid waste management should be delegated to a waste management department. The present practice where solid waste management is the responsibility of the environment and sanitation section of the Health Department cannot solve the problems. Experience from both the developed and developing countries that had breakthrough in waste management revealed that it was not achieved through a centralized civil or local government service systems. For example, a separate solid waste management department exist in the local government system of the United States of America (USEPA, 1971), country and district councils in United Kingdom (CIWM, 2004) and in

Indonesia, a cleaning department (Supriyadi & Kriwkan, 2000). The advantages from such arrangement include but not limited to:

- The possibility of having a separate budget is very high since they are autonomous;
- The Department will be more feasible to the public;
- Total attention will be devoted only to solid waste management;
- No sharing of equipment and personnel officials of the Local Government;
- Interference of political office holders will likely be reduced to a minimal level, and upon all;
- There will be higher priority status.

The above suggested functions of the Local Government have the following implications.

Legal implication: While the Local Government is saddled with the responsibility of acquiring site for solid waste management, the third tier of government has the constitutional right to do so. It is thus important either the State Government acquire land for the Local Government, or the Local Government is delegated to acquire land on behalf of the State Government for its use. Where need be, contiguous Local Government area should come together to form a regional body to manage solid waste for two or more Local Government Areas. Other legal implication arising from the expected functions to be performed by Local Government is that the State Government should legally allow local government based on its local condition to among other things,

- Purchase equipment and embark on appropriate engineering methods;
- Select, register, coordinate and control private contractors for the collection; transportation and disposal of waste and to market recovered products from engineered waste;
- Embark on cost recovery method that will attract private investors into the business of solid waste management;
- Restricting residents to bring into urban areas certain waste component of some quantity; and
- Putting in place insurance schemes for workers that are prone to health hazard due to the nature of their assignment.

Financial implication: The financial implication of this arrangement is that the Department so created to manage solid waste must be adequately funded in order to be effective and efficient. Local Government should be allowed to be autonomous in the disburse of the monthly allocation from the Federal Government. Local Government through the Department can adopt partial privatisation. This is a situation where equipment are purchase, sites are acquired and other necessary logistics are put in place. Private operators are then invited to operate the equipment and the site on lease and/or outright sale after some time. With this arrangement, private contractors will be able to overcome the burden of not being able to meet the capital costs needed to take off effectively. The private operators would now embark on a vigorous cost recovery

from residents based on terms aggregable to both the Local Government and the private operators on one hand and the private operators and the residents on the other. In essence, a sort of commercialisation and privatisation is put in place.

It should be recalled that working in solid waste management department is unlike the civil service schedule where there are five working days. Workers in waste management department would work for seven days in a week. It is hereby recommended that competitive salaries should be paid to workers in Solid Waste Management Department. The salaries of the waste management workers should be an incentive to attract qualified and experienced workers. Since waste management workers will be working in all kinds of weather, agencies should provide protective outer garments such as gloves, boots, rain-hats and raincoats, safety shoes, goggles and facemask among others. Workers in the Department should be provided with uniform. Several advantages are associated with this practice. These include:

- Employees morale is improved, they look better, feel better and work better.
- It improves public respect for solid waste management operators.
- Properly designated uniform will protect the health and safety of employees while dirty clothes can cause skin diseases, cuffs can cause tripping and loose clothes can catch in moving equipment.
- Employees (especially collectors) are easily identifiable.

Personnel implication: The existing staff strength at the Local Government level cannot cope with the solid waste management tasks in the major urban centres in Nigeria. The incapability is not only in terms of quantity but also in terms of quality (qualification and experience). Solid Waste Management Department should be backed (legally and financially) to recruit top-level administrators, engineers and town planners. Experts from Universities, research institutions should be recruited as consultant to carry out preliminary studies (engineering, quantification and characterisation of waste and financial recovery) and design facilities peculiar to a locality.

Mr. Vice Chancellor Sir, to be at a level where we should be, there is need for regular training of staff, to cover areas like: lifting and carrying storage materials, precautions in working around collection vehicles and other hazards and risks related to packing and collection equipment. Training should be given on public relations especially the collection crew who will be coming in contact daily with the members of the public. There is also the need for research and development program on how to improve method of proper and economic solid waste disposal. Indeed, the Federal, State and Local Governments should be sponsoring research project in universities on waste management.

Operational implication: Definite operational strategy should be developed especially in the collection of waste from the household. The best option of waste collection in the one based on house-to-house. However, since many buildings especially in the traditional core residential area are not accessible to roads, the method may be practically impossible. House-to-house collection should be encouraged in areas where houses are accessible to roads. In areas not accessible to road, public storage system that is comfortable for the user should be provided. Regular collection should be put in place.

Public relation implication: We cannot be where we should be in urban environment management if the public support, which is necessary to successfully implement a new solid waste management system or to modify substantially an existing system is very low or not there at all. To secure public confidence, a committee which membership should include the local government information officer, representative of Solid Waste Management Department at the Local Government Area, selected trade unions (Market Women's Association), private industry (manufacturers of pure water and food vendors among others). Through a fairly enlarged committee, different sections of the community will be reached on some of the local government policies on solid waste management. A Voluntary Action Team (VCAT) can also be set up at each political ward. The team may comprise teachers and other professionals, members of trade unions, politicians who will collaborate for action on menace of dumping waste in un-authorised places and reporting of such actions and people to the Local Government Department of Waste Management for necessary actions. The VCAT can also be informing the Local Government on issues which environmental education and enlightenment programmes should address.

Part of public relations is to embark on community improvement exercises. For example, illicit roadside dumpsite can be cleared up. The appearance of the area should be improved so that it will not revert to a dump. Owners of such sites should be warned of the impending compulsory acquisition should the area be allowed to turn into illicit dumpsite. An excellent opportunity to improve community relations is also through the prompt, courteous and efficient handlings of citizens' complaints especially when costs have started to be recovered from users of services. Once the public confidence has been gained, managing solid waste will become less tasking.

Managing the informal participation in solid waste: Some informal participants in solid waste management have come to stay, even though, there are no legal backings. Such participants include the different types of scavenger and itinerant buyers of the scavenged materials. It is recommended that policies should be made to integrate these different informal participants into the mainstream of urban solid waste management. These participants are enormous in number and been very valuable in reducing solid waste into organic, after the non-organic components (nylon and polythene materials, plastic bottles, glass bottles and metals) have been sorted and scavenged. The remaining organic materials can be composted and processed into organic fertilisers.

Political wisdom and will: Mr Vice-Chancellor and all other dignitaries present here, let me conclude this my recommendation by drumming it loud and clear that if we want to be where we should be in urban environment management in Nigeria, the issues of political wisdom and political will should be taken seriously. Political wisdom is getting our priority right; political will is the desire to progress. Political office holder at whatever level, as part of wisdom should not rely on their intuitions to solve a problem in the magnitude of urban solid waste management, reduction in crime occurrence, the menace of begging, beggars and street children, and consequent poor quality of life. All political actions on urban environment issues should be based on research. There is the need for SOLID WASTE MANGEMENT PLAN. This is a subject plan to be prepared at the local government level and also requires political wisdom and political will.

The lack of political will manifests itself in the misuse, misappropriation and embezzlement of money in relation to the management of solid waste. For example, where is the political will

when budgets for the acquisition of dumpsites in the YEAR X1, the construction of that acquired site in the YEAR X2 and the maintenance of the constructed dumpsite in the Year X3, and the allocation were released. But in the Year X4, no evidence that a dumpsite has been acquired, constructed nor was there any maintenance exercise carried out. Our politicians and leaders should therefore show political will to enhance residents' quality of life and of living. To everyone of us, the political leaders, the civil servants at Federal, State and Local Government levels, the residents and even other participants in urban environment management, we should THINK GLOBALLY, BUT ACT LOCALLY in order to be where we should be and live where we are.

SERVICE TO THE UNIVERSITY AND COMMUNITY AT LARGE

I have served in various capacities at the Departmental, Faculty and University levels. I was appointed as Head of Department of Urban and Regional Planning, Obafemi Awolowo University for 2011/2012 and 2012/2013 Academic Sessions. I also by the grace of God served as the Chairman of the Curriculum Review Committee of the Department. I had one time or the other served as the Editorial Secretary and Editor-in-Chief of the Department's Journal. I also served as Chairman of the Department Postgraduate Committee.

At the Faculty of Environmental Design and Management level, I have been privileged to serve as the Editorial Secretary and Editor-in-Chief of the Faculty Journal as well as the Chairman Faculty Postgraduate Committee. I served as Chairman of Faculty of EDM International Conference Committee. I served as the Faculty Vice, and at various statutory and Ad-hoc committee in the faculty.

Mr. Vice Chancellor Sir, I have served in cognate faculties to my own in the university in one capacity or the other. I was a member Faculty Board, Selection Panel, Review Committee of the Faculties of Arts, Education, Agriculture, Social Science and Administration of this university. I have also served as internal reviewer of both faculties and departments for the assessment of candidates to be promoted to the positions of Reader and Professor. Suffice to submit that I have been internal examiner in virtually every cognate Faculties and Departments to EDM in this university. My service was also rendered at the Faculty of Dentistry as the Annual Guest Lecturer on Waste Management. I also served as member of Ife Journal of Science and technology. I was one time a member of the Postgraduate College Board. With some eminent Vice Deans then, Professor Daramola (Arts), Professor Aransi (Administration) and Professor Osunbitan (Technology), I served as a member of the sub-committee of Deans on result vetting.

Mr. Vice Chancellor Sir, I served as the pioneer Secretary, Financial Secretary and later Vice President of our now prestigious Awovarsity Cooperative and Credit Society Ltd., OAU, Ile-Ife. This was when we were collecting cash from members in order to see that we formed the cooperative society.

Outside the University, I have had the privilege to be guest lecturer to the National Environmental Standards and Regulation Enforcement Agency (NESREA) on the Past, Present and Future of Solid Waste Management in Osun State, Nigeria as Public Enlightenment Programme. On several occasions, I had been invited to present lecture and hands-on on health and safety guides to street cleaners in Osun State. Similarly, I have given lectures during

celebration of World Environment Day organised by the Osun State Environmental Protection Agency and Lead City University, Ibadan, Nigeria.

I have been a reviewer to both Local, National and International Journals. These include Ife Planning Journal, Ife Journal of Social Science, Ife Quarterly Journal of Administration, Journal of Estate Management, Journal of Nigerian Institute of Town Planners, Journal of Nigerian Institute of Estate Surveyors and Valuers. Others are Local Environment (Routledge, Taylor and Francis), Waste Management and Research (Sage Publication) and Material Cycle and Waste Management (Springer) among others.

I am an external examiner to Federal, State and Private Universities. The Federal Universities include University of Lagos, University of Ibadan, Federal University of Technology, Akure. The State are Ladoke Akintola University of Technology, Ogbomoso and Olabisi Onabanjo University, Ago-Iwoye. The private Universities are Lead City University, Ibadan, Joseph Ayo Babalola University, Ikeji-Arakeji. I had been visiting lecturer to many universities. These include LAUTECH, Ogbomoso, Bells University of Technology, Ota, Benue State University, Makurdi and the Medical University, Ondo.

At a more professional level, Mr. Vice Chancellor Sir, I have not bankrupt at all. I have contributed in various dimensions. For example, I was involved in the

- Design of Recreational centres in locations at Ibadan as Town Planning Officer.
- Dispute adjudication.
- Declaring Gbagi-Dugbe as one way traffic to minimise traffic hold up.
- Design of private residential layouts.
- Review of Assets and property valuation report of LAUTECH, Ogbomoso.
- Master Plan Preparation of the following institutions:
 - George Green Secondary School, Ogbomoso,
 - College of Medicine of LAUTECH at Asubiaro, Osogbo,
 - Divine Grace University, Isan-Ekiti,
 - Achievers University, Owo, and
 - Babcock University, Ilisan-Remo among others.
- Environmental Impact Audit of:
 - Iwopin Paper Mill for Privatisation,
 - Iron and Stell, Fasina, Ile-Ife,
 - Bellview Air crash site, Ogun State,
 - Dana Air Crash site, Lagos, and
 - Globacom Trans-receiver Stations in Oyo and Osun States.
- Environmental Impact Assessment of:
 - Five (5) Earth Dams under the Millenium Development Goal Project in South East, Nigeria,
 - Iron and Stell Nigeria Ltd., Fasina, Ile-Ife, and

- Many Telecommunication Trans-receiver Stations.

I have also participated as

- Consultant to UN-Habitat on the establishment of City Profile and Preparation of Structure Plans for Ikire, Iwo and Ejigbo,
- Osun State, Main Consultant to the Osun State Government on Urban Renewal (O'Renewal) for Ilesa,
- Consultant in the review of Research Proposal on Urban Vulnerabilities to Climate Change in Africa (CCAA): 105514-001 by the International Development Centre (IDRC) Canada,
- Chairman, Landscape Committee of the OAU International School, and
- Member (Co-Investigator), Waste-to-Energy research Group (Research funded by TETFund).

Mr. Vice Chancellor Sir, I have supervised several undergraduate students and 54 postgraduate students; 34 M.Sc, 2 M.Phil and 18 Ph.D. Permit me to mention my Ph.D supervisees, who are in places in Nigeria, West Africa Countries and other parts of the world. These are:

- | | |
|---------------------------------------|--|
| 1. Prof. Gbemiga Bolade Faniran: | Obafemi Awolowo University, Ile-Ife |
| 2. Dr. Adewumi Israel Badiora: | Olabisi Onabanjo University, Ago-Iwoye |
| 3. Dr. Ebere B. Udeh: | National Environmental Standard
Regulation and Enforcement Agency |
| 4. Dr. Sesan Adeniyi Adeyemi: | University of Lagos, Akoka |
| 5. Dr. Olusegun Peter Akinpelu: | Bells University, Oota |
| 6. Dr. Olanrewaju Timothy Dada: | Olabisi Onabanjo University, Ago-Iwoye |
| 7. Dr. Amos Oluwole Taiwo: | Olabisi Onabanjo University, Ago-Iwoye |
| 8. Dr. Solomon Ayodeji Olatunji: | Federal University, Oye-Ekiti |
| 9. Dr. Deborah Bunmi Ojo: | Obafemi Awolowo University, Ile-Ife |
| 10. Dr. Latef Adeleke Adeniyi: | Federal University, Oye-Ekiti |
| 11. Dr. Lawal: | |
| 12. Dr. Oluwole Samuel Ojewale: | Institute for Security Studies, Dakar
Senegal |
| 13. Dr. Oluwatoyin Adewunmi Bolukale: | Lead City University, Ibadan |
| 14. Dr. Temitope Muyiwa Adebara: | Canada |
| 15. Dr. Oyetunde Maryalice Ajayi: | Federal Capital Development Authority,
Abuja |
| 16. Dr. Daniel Olusola Olaleye: | Kwara State University, Malete |
| 17. Dr. Grace Oluwatoyin Oladunni: | University of Ibadan/ |
| 18. Dr. Oyedele Isaac Olajide: | Uk |

Mr. Vice Chancellor Sir, ladies and gentlemen, I need to submit that the chronicles of my service in communities I found myself while working at the same time in Obafemi Awolowo University will not be complete without mentioning what God had done through us when pastoring Ogo-Oluwa Baptist Church, Mokuro Road, Ile-Ife. God work tremendously through us (myself, wife and children) to turn the church around physically, socially, economically and most importantly spiritually. We met the church in a wooden wall with less than thirty worshippers. With God's

help the church became a full fledged and organised Baptist Church with modern building (fully equipped with pews), Men Missionary Union, Women Missionary Union, the Lydia and Girls Auxiliary, Royal Ambassador, Choir, Ushers and other formidable organs. Our services are computerised while befitting public address system is put in place. The church is formidable socially where members interact with one another in an atmosphere of love. The need of a member become need of everyone and which everybody is ready to meet (Acts 2: 45-47).

Economically, the church grew as individuals under the instruction of professionals in the church became equipped in one way or the other. The church through one of her programmes established a school and provided employment not only to the church members who are ready to work, but also to immediate members of the community where the church is located. Many programmes were put in place that promoted the spiritual growth of the church. Such programmes include fervent mid-week bible study and prayer, Thursday meeting for every organ of the church, choir meetings, Sunday School Preparatory Class, Discipleship Lifestyle, Vigil and Glorious Sunday Services among others. The church members have remained blessed through life that were lived above sin. The church may be small in population but very strong spiritually. This is obvious through the social, economic and spiritual influences within our Ife Oluwa Baptist Association, Osun Baptist Conference and The Nigerian Baptist Convention. May the name of God be praised for our family being a vessel of honour in His hands.

ACKNOWLEDGEMENTS

Mr Vice Chancellor Sir, if care is not taken, this should have been the longest section of this lecture. This is because God has used so many people to make me who I am today. Let me start by giving thanks to the Almighty God who through Jesus Christ spared my life, watch and direct my journey in life. From a village near Ifetedo in Ife South Local Government and brought me into limelight. I thank Him for being "I am that I am" in my life. I do not know why God loves me so much. May His name be praised.

Among the people God used to shape my life and discipline me, I will not forget my uncle, the closet to my parents among his siblings – Pa Daniel Kehinde Aderemi. I followed him to Amulagbongbon-Kan-O-Si (where he was a cocoa farmer) at the age of six years old. He and his late wife, Madam Alice Oyeronke Aderemi deserved accolade for making me not to even remember my biological parents. I doff my cap for one of the professors we did not have. Many of his philosophical statements still ring bell into my ear even till this moment. He taught me hardwork, perseverance, humility and telling bitter-truth even in the presence of danger. My parents (Late Dn. Simeon Afon and Abigail Afon) also deserved to be mentioned in my life's journey. Apart from being my biological parents, the ties between him and some of their siblings made it possible for me to be free among his people. My parents were great disciplinarian, hard working man and woman, courageous people who honour nothing but the truth. A statement made when I was then wayward that I will not only be responsible for my action in life, but that moreover, God will demand the souls of my younger siblings from me if I continue in the life i was living then made me to think that I need to give my life to Christ Jesus. Thanks to God for these wonderful man and woman of faith in Lord Jesus. They died with the names of Baba Deacon and Mama Deacon.

My mother-in-law is another person that deserved acknowledgement. Mrs. Maria Eboade Adeyi of blessed memory was a woman of honour, integrity, hardwork and character. Her immense financial help while on my Ph.D programme was very noteworthy. Probably, it would have taken me longer time to complete the Ph.D work if she had not come in financially. I thank her very much, even though she is no more alive. To my sister-in-law (Mrs. Oluwayemisi Olaniyan and Mrs. Yemi Adeagbo) thank you for your tremendous supports.

I have to acknowledge the university administration for giving me employment. I left LAUTECH, Ogbomoso for OAU, Ile-Ife in 2001. The time I came was during a somehow long period of ASUU strike. I had resigned my appointment in LAUTECH, while as a result of the strike, I could not be absorbed. I was then floating. It took the intervention of the then Vice Chancellor, Professor Rodgers Makanjuola to calm the storm in which I found myself. I also thank other Vice Chancellors that came after Prof. Makanjuola. I enjoyed peace of mind at work and in the residential quarter allocated to me. Mr Vice Chancellor sir, I thank your predecessors and you for granting me every legal request of mine which included sabbatical leave, annual leave and many more. I want to appreciate Professor Ogunbodede who so much believed in me and made me the Chairman of the Landscape Committee of OAU International School. The gate, the gate house and perimeter fence put up during the period are there to showcase the work of the committee. Prof. Ogunbodede gave me the blank cheque of choosing the committee members. The incumbent Vice Chancellor also believed in me and did not change me as the chairman and members of the Committee. Due to logistics problems, however, we could not make progress as expected. I thank you very much sir.

All the services I could render in various faculties and committees would not have been possible if not because of the various Deans who also held me at a very high esteem. These Deans include but not limited to Late Professors Abiodun Adesanya, Tajudeen Aluko and Olawale Fadare. I functioned as Chairman Postgraduate Committee, Editorial and Editor-in-Chief of the Faculty Journal and Faculty Representative in the Senate. I thank you all. The incumbent Dean is also acknowledged. We have been working together to move the Faculty of EDM forward even before becoming the Dean. I acknowledge the following academics in the Department of Estate Management of my Faculty. Professors Abel Olaleye, Tunde Oladokun, Matthew Oyewole, Alirat Agboola, Araloyin and other colleagues like Drs. Ekemode, Ayodele, Odebode, Olapade and Siyanbola contributed in no small measure to my academic development. They are reliable in every aspect of academic duties. Thank you.

The name of Professor L. O. Adekoya will continually be ringing in my life. The Waste-to-Energy Project funded by TETFund is Prof. Adekoya's brainchild. As the leader of the Team initially, I learnt a lot from him in terms of transparency, integrity and the management processes in such project. Thank you, Sir. I cannot forget my colleagues in the project. These are Professor Titilayo and Obayopo. The two have been very wonderful in analyses, hardwork and integrity. I also thank students at both the B.Sc, M.Sc and M.Phil levels that worked on the Waste-to-Energy Research Project.

I have to acknowledge the inputs of my department where I studied for every academic degree I obtained. The Department, being the first of its kind in the country (Nigeria) is very unique for unity, hardwork, innovation and progress. I must put on record the impacts of Professor Luke

Oladele Olajuyin (of blessed memory) on making sure I joined the Department from LAUTECH. He was a man of peace and progress. My M.Sc. and Ph.D degrees supervisor is also acknowledged. This is in person of Professor Isaiah Afolabi Okewole: an organised person, very diligent, kind but tough. I am proud to have him as my supervisor. I must not forget to mention the contribution of one of my mentors in this academic journey. This mentor is also a friend, a brother as well as a confidant. I am referring to Professor Samson Olawale Fadare. I cannot quantify every effort you have expense on me. I am very sure that you are proud of me because your efforts on me are not in vain. God bless you sir. I cannot forget Professor Lasunkanmi Mykail Olayiwola (retired) who taught me from Part II up to the Ph.D level. He loves people to a fault. His generous advice I can still remember even as I deliver this lecture. Thank you, sir. Other lecturers of mine include Late Professor Emmanuel Ajibade Ogunjumo, Late Dr. Adesokan Olufemi Adeleye and Professor Emmanuel Olufemi Omisore. Each one of them has impacted me positively during my journey both as student and academic staff member.

Mr. Vice Chancellor Sir, the present crops of academic staff members in the Department are all my students except but one. God has given me the grace to have instructed them at various levels of their academic careers. They are colleagues that inspired me to work harder and better. These are Profs. A. A. Abegunde, O. P. Daramola (who is also the current Head of Department), O. A. Olojede, O. B. Olugbamila and G. B. Faniran. Others are Drs. A. O. Ojo, D. B. Ojo, O. D. Adetayo, O. G. Oluborode, H. Afolabi, Mrs. T. R. Adeyemi, Drs. D. O. Mobolaji and I. A. Akerele. They are wonderful students and colleagues. I must also acknowledge Professor Peter Olawuni for making my stay at Ife and the Department in particular very memorable and free of crises of any sort. I thank you all. The efforts of the non-academic staff members who made the Department environment conducive for teaching and research are hereby acknowledged. These include Mrs. G. A. Ewurum, Mr. F. O. A. Williams, Mrs. F. P. Odetoye, Mrs. V. O. Ojo, Late Mrs. B. A. Idowu, Late Mrs. G. T. Olubanjo, Mr. F. Adesiyani, Mrs. V. B. Olaoye, Mr. M. Olowoyo, Late Mr. H. Awotidoye, Mrs. A. A. Oladepo and Miss G. Chikwendu.

My Baptist Convention members are also acknowledged. This is a denomination that actually showed ways of growing in the knowledge and wisdom of God. I acknowledge the roles played by the church under which I minister in my spiritual and academic development. The peace I enjoyed while at Ogo Oluwa Baptist Church is unparalleled. I want to put on record that the church is a source of inspiration for me and my family members. Our eldest child was in Primary One when we got to the church. Before we left, through the church members, our children have become disciplined, physically and spiritually developed. I must appreciate every Ife Oluwa Baptist Association Moderator I worked with. Rev. Dr. Jerry Olakunle, Rev. Dr. Ayodele and Rev. Dr. 'Femi Olaniyi thank you for every way you had contributed to our development. I also recognise my spiritual leader in Osun Baptist Conference, the President - Rev. Dr. Olubunmi Obalade. He has been a source of inspiration to our ministry and through his prayers and advises, our family, our ministries have been blessed. Thank you for coming sir. My wonderful Blessed Brethren Organisation from Caretaker Baptist Church, Ogbomoso are hereby acknowledge. Our development spiritually and economically through members' prayers admonition are worthy of praises. Thanks to members for being there through thick and thin, and these are appreciated. I must thank my Pastor at home, First Baptist Church, Moya, Ogbomoso. This man of God is

worthy of my respect and admiration in every aspect of the gospel ministry. Keep it up and God will continue to bless you.

People from Ekeade Aderemi Compound, Ogbomoso are excellent people who contributed to my up bringing academically, socially and spiritually. Elders like Dn. Adeoye Adeniran, Moses Adeniran, Comfort Abioye had been there for me long ago. My acknowledgement of my paternal lineage will not be complete without mentioning the likes of felicia Adeleye, Bosede Akintola, Lydia Aremu, Sunday Aderemi, Oluwaseun Aderemi, Rev. Dr. Timothy Adeniran, Adesoye Aderemi and hosts of others. There are some elderly people that I do send on “errands” as if they were my boys. I have enjoyed the grace of God in their lives. These people include Pa. Kunle Azeez, Rev. Dr. Adedokun, Rev. Adesina, Rev Oyelekan and host of others that are too numerous to be mentioning here. I say thank you for your contributions towards our spiritual, academic, social and economic development. I do not forget my colleagues, friends and mentees in LAUTECH, Ogbomoso: Dr. Arch. Okanlawon, Profs. Thompson Adeboyejo, Folasade Adigun, Adejoke Adigun and others. Thank you for your support.

To my students in general especially my supervisees. I say thank you. You are the propeller of this inaugural lecture. Even when I had decided that this lecture will not come up, you all opposed the idea. Today through you, the idea has become a reality. I am honoured in every way, and your supports spiritually, financially and physically are invaluable. Thanks to my dear Prof. Gbemiga Bolade Faniran for coordinating and putting everything together. Special thanks to everyone who worked in one committee or the other.

Let me conclude this section by appreciating my immediate family members. God has blessed me with wonderful children: Rereloluwa Alabi, Halleluyah Oluwadara Ajibola (Mrs.), Sharon Oloruntoba and Praise Enitanrere. These children made my academic pursuit very easy and our ministerial endeavour to be very enjoyable. God has been so kind to us through them. Your own children shall give you peace at every junction of your life, in Jesus name. God has been so wonderful and kind to me by giving peace and tranquillity in my home. This is through no one than my precious and loving wife Rebecca Oluwaponmile Abebi Adenike Afon (nee Adeyi) (Iya Afon). In my academic and ministerial pursuits and even in relating to other members of extended family member, my wife is wonderful. The first set of scales I used in measuring waste when I started my Ph.D work was purchased by her. Sincerely, I am neither lying nor exaggerating, I do not know how I can thank her enough. Words are not enough to describe her. Thanks for being available and accessible every time to every member of my immediate and extended family. You have honoured me with your totality; God shall continually be honouring you.

Now to him who is able to do exceedingly abundantly above all that we ask or think, according to the power that works in us. To Him be the glory, honour, majesty, adoration and thanksgiving. Amen.

Mr. Vice Chancellor Sir, distinguished ladies and gentlemen, I thank you for coming and for listening.

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