



GAPS IN SOLID WASTE MANAGEMENT IN ELELE COMMUNITY

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ABSTRACT

Elele community has experienced unprecedented increase in its population due to several reasons. Returnees from neighbouring communities that has problems, influx of internally displaced people due to insecurity in some parts of the Local Government and within and influx of expertise seeking jobs in the city are few of the many reasons which contributed to the increase in the population. This increase in population has result to increase in the volume of solid wastes generated. Due to changing lifestyles and consumption patterns, the quantity of waste generated has increased with quality and composition of waste becoming more varied and changing. The Local Government Sanitation Authority is the only public institution mandated to handle, among other things, solid waste management in the community. It is the department that is fully responsible for administering and financing the solid waste management. However, the department is challenged with lack of treatment and disposal facilities, limited and unsustainable funding, inadequate technical capacity and lack of policy, laws and plans for solid waste management. Despite all these limitations, the department of environment and sanitation is striving to ensure that the community is kept clean and environmentally friendly. The main issues in the management of the generated solid wastes is the lack of plan, limited and unsustainable funding and lack of the legal mandate to recruit technical staff. This paper seeks to identify the gaps in the management of solid waste in Elele community and find out the challenges the Sanitation Authority is facing therein. It also focused on the administrative, financial and the technical aspects of solid waste.

Keywords: Environment, environmental sanitation, solid waste management, solid waste,

INTRODUCTION

Elele community is one the seat of the local government of Ikwerre, which is one of the twenty-three local government of Rivers State. It is a municipality within the jurisdiction of Ikwerre LGA of Rivers State. It occupies an area of 11,376.15 square kilometres. The city is one of the fastest growing towns in Ikwerre LGA in terms of socio-economic activities and infrastructural development. It is, as well, considered as one of the fastest growing cities in the State (Prince, 2013). There is no exact figure for the population of the city. Coupled with this socio-economic growth and industrial development, the city is experiencing rapid growth in its population due to the influx of returnees, internally displaced people and foreign technical expertise seeking job opportunities in business sector (Maduka, 2011). With the increase in the population, the population density has also increased drastically. The increase in the population has, subsequently, resulted in the increase in solid wastes generated in the areas with high population densities. As such, the unprecedented, increase in the volume and the variety of solid [and hazardous] wastes generated is attributable to this increase in the population, the change in lifestyle and consumption pattern, and the unevenly distributed population density (Amadi, 2013).

The city's already inadequate solid waste management system is not coping with the growing population and the increase in the solid waste generated (Philip, 2013). Despite these socioeconomic and infrastructural improvement, Elele City, like many developing



cities in the State and Country, is encountering tremendous difficulties in managing the generated solid wastes. According to Greg (2016), the management of Solid Wastes is effective only if there is proper institutional setup, strong legal and policy frameworks, sufficient technical competence, sustainable financial support and adequate infrastructural facilities like roads and disposal sites.

Statement of Problem

A clear and comprehensive understanding of the Solid Waste Management processes in the city is a prerequisite for the design of any effective remedial measures. Limited reliable data on the Solid Wastes generated lack of proper and effective operational plans and conflicting institutional roles, inadequate technical capacity and unsustainable financial support are some of the major reasons of failure in the management of solid wastes in most cities in the developing countries.

Aim and Objectives

It is worth noting that Elele Community is not alone in regards to the inefficacy to manage its generated solid wastes. Many communities and Local Government Areas in the developing world are in dire need of improving their Municipal Solid Waste management systems. Therefore, this work is intended to “build the technical capacity of the Local Government expertise in the field of Solid Waste Management.”

The objectives of this paper is in three folds.

1. It is intended to find out the main gaps in the management of solid wastes so that the department can design and develop a comprehensive Solid Waste Management Plan for the community,
2. It also intends to identify the challenges encountered by the Department of Environment and Sanitation in the management of the Solid wastes generated.
3. To provide information for the Local Government Sanitation Authority data base, which can be consumed by other public and private institutions for the development of their respective policy, legal and the institutional frameworks, Strategic and annual Plans.

Significance of the Study

The goal of this work is to “provide information for Ikwere Local Government Sanitation Authority that will be used for the development of a Comprehensive and Sustainable Solid Waste Management Plan for the Elele Community”. As some cities across the region are facing nearly same problems encountered by Elele in the management of Solid Wastes, the results from this work conducted and presented in this report will have a wider regional relevance and application.

Conceptual Framework

Joseph (2001), defines solid waste (garbage, refuse or rubbish) as solid materials which are discarded from industrial, commercial, agricultural, mining or other community activities. Brain (2003), saw municipal solid wastes as the urban refuse including residential,



industrial and commercial wastes that are collected for land filling. It does not include agricultural wastes. Okere (2014) mentioned that solid waste management is the systematic collection, source separation, storage, transportation, processing, treatment and disposal of solid wastes.

Johnson (2017) opined that integrated Solid Waste Management refers to the strategic approach to sustainable management of solid wastes covering all sources and all aspects.

THE SOLID WASTE MANAGEMENT SYSTEM IN THE DEPARTMENT OF ENVIRONMENT AND SANITATION AUTHORITY IN EMOHUA

The Policy Framework

According to Ben (2003), the Environmental Policy of the government emphasizes on the protection, conservation and sustainable use of Field Supervisors and Rate Collectors. The national ministry of environment was intended to develop policies, laws, regulations and guides for the protection and monitoring of the environment and keep the status of the environment under review. He further states that the Ministry is responsible for, among others, the development of policies, legislations and regulations, guidelines in relation to sustainable management of wastes in Nigeria. One of the most important principles of the national environment policy is the principle of sub-sidarity that implies decentralization and devolution of powers and responsibilities to the lowest level of governance (i.e. the local government) on environmental matters including solid waste management. It is worthy of note that there is policy in Elele Sanitation Authority that emphasizes on the need to manage solid waste in accordance with the integrated waste management approach, guided by the principle of the 3Rs (Reduce, Re-use, Recycle). In a nutshell, the policy statement is that Ikwerre Sanitation Authority recognizes solid waste as a resource that should be managed so as to ensure an improved quality of life, promote ecological integrity and encourage economic vitality both upstream and downstream in a way that facilitates sustainability."

As already stated, solid waste management is the responsibility of the department of environment and sanitation. Therefore, for the purpose of solid waste management, the department divided the city blocks into zones "A", "B", "C" and "D". Each zonal coordinator is expected to request, from the headquarters, the weekly needs of the zone for the collection and the transport of the solid wastes from the zones to the dumping site. These needs include compactor trucks, collection bags, collection tools and safety materials.

The Fiscal/Financial Systems for Solid Waste Management

There were two types of revenue; own revenue and subsidy from the state government. The subsidy is allocated for the local government council to cater for administrative and operational cost. The local government council gets its revenue from approval fee for construction, business tax, and license fee for commercial vehicles and charges for issuing trading licenses. The revenue for the blocks including rental fee for assets such as exhausters, license fee for shops in the markets and property tax (Philip, 2013). The department of environment and sanitation in consultation with the local government



council administration sets the prices of the monthly fee for waste collection service, and revises it every year. It collects the fees from several large-volume solid waste dischargers such as hotels, motels and big restaurants. Some institutions contract the local government council to provide solid waste collection service. The representatives collect fees from residents, small or middle-scale shops and others, and remit them to the department of environment and sanitation. The department latter remits all these collected money to the local government council's headquarters. It is these remittances that the headquarters use to finance the solid waste management activities, including payment of the casual workers. Regardless of the amount remitted, the department requests the funds on behalf of the representatives based on each zones weekly financial requirements. The weekly budget of the department, including the budget of the zones are vetted by the headquarters prior to approval. As the remittance from the department is conducted weekly, the vetting and the approval of the budgets is done weekly as well but in different days (Philip, 2013).

TECHNOLOGY AND INFRASTRUCTURE

Collection

Solid waste collections from the sources are expected to be the responsibility of the zone representatives which are the field offices of the department of environment and sanitation. The sources here are meant the markets, hotels, public and private institutions and business entities. Depending on the location of the source from main and accessible road, the department may decide to identify a primary and a secondary collection points. The collection routes, time and dates are specified; for example, it could be twice every week in the morning through routes "x", "y" and "z". From these points, the wastes are then loaded onto a compactor truck then transported to the treatment and final disposal sites respectively (Ben, 2003). The community zones in corporation with the market union have clear and distinct responsibilities. The instructors or the field supervisors from the respective city zones, monitor and supervise at the collection points in order to get people to understand the rule. And the market union manages the collection points and received complains and other opinions from dischargers. In the case of the markets, primary collectors who are a private sector recognized and registered by the department, are licensed to collect the solid wastes from the sources to the respective collection points. In the residential areas, the wastes are collected from the sources to the primary collection point only on the scheduled date (Prince, 2013).

In summary, the collection system in the city is a mixed system. It can be station collection or collection from primary collection points. This system is mainly effective in the markets. The door-to-door collection system is designed for households, shops, public and private institutions, hotels and other business entities which are easily accessible by the compactors/trucks. The other system is the street collection system. This is meant for street sweeping. Here, the workers collect the wastes from street sweeping and those which are disposed along the main roads, and load them into the compactors/trucks directly.



Transportation

Transportation of the generated solid wastes in the city takes three systems. In one system, the generated wastes are collected from the sources and transported to a primary collection point mainly along an accessible road. Here, a tricycle or tractor pulling a cart is used. From the primary collection points, the wastes are transported to the dumping site by using either a compactor or a truck. The other transportation system is the transportation from the source to the dumping site directly. This system is meant to serve the entities, such as the manufacturing industries or the hotel industries, which generate huge amount of garbage. This system is only applicable when the local government council enters into agreement with an institution or a manufacturing industry to provide both garbage collection and transportation service. A compactor used by the department for transporting wastes (Brain, 2003).

Recycling and Recovery

To reduce the amount of wastes going to the landfills, and recover raw materials to supply the manufacturing industries, it is necessary to recycle or recover wastes generated. There is no guiding principles for waste recycling and recovery, though it is an industry that can be a sustainable funding mechanism for the local government council.

Treatment and Disposal

The city does not have neither a treatment nor a disposal facility for the solid wastes generated. All the wastes which are collected from the city are transported to the only dumping site, located outside the vicinity and jurisdiction of the local government council, for final dumping. Burning of wastes in the primary collection point.

Public-Private Partnership

The department of environment and sanitation of the local government council can be contracted as a service provider by any entity that can afford payment for the service. This service can be solid waste collection, transportation, treatment, processing and/or disposal services. Private entities which can provide solid waste collection and/or transportation service can sign an agreement with any entity or institution or the zonal rep to provide solid waste collection and transportation service. Such private entities must be recognized and registered by the department of environment and sanitation. The department has not yet put down guidelines or principles that will govern such partnership. In the markets, the business communities (traders union) have a partnership with the private waste collection and transportation service providers. They hire these private service providers to provide, to their respective markets, the waste collection and transportation services. This agreement is done after consultation with the zonal or field office and taking the consent of the department of environment and sanitation (2016).

In a nutshell, in the Public-Private Partnership, the public sector or the local government Council takes the roles of inspection and regulation, while the private sector provides the waste collection and transportation services and the service beneficiary pays for the services provided by the private sector. The department does not have effective program of



environmental awareness which is expected to be a component of the solid waste management plan. A contracted private vehicle collecting wastes from the source.

Research, Data and Information

Data and information on waste characterization and quantification, and assessment of current solid waste management system for operational stages provide the basis for a comprehensive locality-specific waste management system. As population and socio-economic status of urban centres like Elele are not static, the volume and variety of solid wastes will change accordingly. As such, frequent researches are necessary to enhance the development of an effective and comprehensive solid waste management plans. Reports of such researches are important tools for keeping the state of the environment under continuous review. The department does not have an independent data base for solid wastes or other related subjects (Greg, 2016). However, it depends on reports produced by the NGOs or the development partners such as the World Bank or the private sector companies. Data on population, population density, waste generation, waste composition and waste density are some of the important data that can be used for the development of an effective solid waste management plans for the city. However, for the purpose of this exercise, it is worth noting the few available data on solid wastes in the city.

Waste Composition

It is worth noting that the increase in the city's population, with unequal density distribution is an important factor in determining the volume and the variety of wastes generated. Having knowledge of the composition of wastes generated will ease the process of managing them. A study conducted by Amadi in 2013 found that the major component of waste generated from the city is organic waste, constituting up to 31%. Plastic waste constitute 20% which is broken down into detail as 46% clear PET, film plastic was 33%, HDPE containers 12%, and other plastics at 5%. Brown and green PET accounted for 2% each. 12% of the total waste stream generated was paper and cardboard, and metal waste accounted for 7%, special care waste was 2%, textiles constituted 4%, ash and soil 12%, glass 5% and other wastes accounted for 7% (Amadi, 2013).

Waste Density

Waste densities in African cities may be in the range of 180 to 540 kg/m³ due to the high moisture and putrescible organic content. The average density for Elele's waste is found to be 112 kg/m³, which is low compared to that of an average African city. This figure can probably be due to two factors. Firstly, it could be because the study was conducted during the dry season and so the moisture content was low. The second is that, in general, the organic content of Elele waste is low in comparison to that of the average African city (Amadi, 2013).

METHODOLOGY

Identifying the gaps in the Solid Waste Management in Elele community is a huge exercise which needs a number of ways to gather the necessary data and information. Most of the information which make up this report were taken from previous reports



developed by the government and the NGOs working in the field of environment and solid wastes management. Previous reports were mainly used to collect the data and the information. These constitute the secondary data and information in this report. The other method used for gathering data and information was direct interviews with the community leaders (representing service beneficiaries), the private sector (business community) representatives, the public health officials and the officials who are responsible for waste management in the respective zones of the Local Government Area. This is part of the primary source of the data.

Finally, field visits and field inspections, which are the most important source of primary data and information, were also used to gather the information for this report. The "LGA Guidelines for the Assessment of Solid Waste Management System and Gaps therein" is used to analyse and identify the gaps in the current waste management practice in the city. Solid Waste Management can take any of the three concepts; Life-cycle-based Integrated Solid Waste Management, Generation-based Integrated Solid Waste Management or Management based Integrated Solid Waste Management. The Life-cycle-based Integrated Solid Waste Management concept is based on lifecycle assessment of a product from its production and consumption point of view. The reduction in consumption, and reuse of the discarded products within the production system as a substitute for new resources, can lead to reduced end-of-cycle waste generation; thus, less efforts and resources would be required for the final disposal of the waste.

The Generation-based Integrated Solid Waste Management concept is based on its generation from different sources including domestic, commercial, industrial and agriculture. This waste could be further classified as hazardous and non-hazardous waste. The former has to be segregated at source and treated for disposal in accordance with the Local Government regulations. The 3Rs approach (reduce, reuse and recycle) is applicable both at source as well as at the different levels of solid waste management chain including collection, transportation, treatment and disposal. The Management-based Integrated Solid Waste Management concept is based on its management which includes regulations and laws, institutions, financial mechanisms, technology and infrastructure, and role of various stakeholders in the solid waste management chain. However, the solid waste management in the community does not take any specific concept, but if critical analysis is taken, the solid waste management in the community takes a rather mixed approach, which encompasses both the generation-based and the management-based integrated solid waste management concept. The Solid waste management system being practice by the Local Government Sanitation Authority is a single management system because there is no other institution responsible for the management of the hazardous and industrial wastes. A management System covers all aspects of waste management; from waste generation through collection, transfer, transportation, sorting, treatment and disposal.

In many countries, the hazardous and industrial wastes management are the responsibility of the National (Federal) government. In fact, most of the industries



operating in the vicinity of the community are light industries, mainly the bottled water manufacturers. Therefore, no hazardous industrial solid wastes are expected to be generated from the community.

TECHNOLOGY

Collection

The rapid growth in population has put significant pressure on the already inadequate waste management services. There are no figures available on the amount of waste being collected in Elele at present. The garbage are collected from business centres, main roads and public institutions. The garbage are collected from the sources to assembling points (primary collection points). Using a mini-truck/tricycles, and then collected from the primary collection points and transported to a secondary collection points. No garbage are collected from the main hospitals and other health facilities, except the small scale health facilities (clinics and drug stores) in the markets. According to the operating system in the Local Government Sanitation Authority Officer, the garbage from the residential areas are supposed to be the responsibility of the quarter officer of the respective areas. The quarter officers are not performing their work efficiently, partly because they are not funded, and partly because there are no access roads leading into most parts of the residential areas.

Segregation and Sorting

Solid Wastes collected from the sources are mainly general and mixed. Solid wastes generated from the markets, public and private institutions and residential areas are not segregated from the sources. It is only in the health facilities that the used sharps are segregated from the other solid wastes such as plastics, and finally dumped or disposed separately. The informal waste pickers segregate the wastes only to collect plastics, steel metals and aluminum cans which can be sold to recyclers in and outside the country.

Transportation

There are only three compactors, two trucks, two tractors with an open cart each and four tricycles. The tricycles and the tractors which have carts are used for the transportation of the collected wastes from sources to primary collection points. While the compactors and the trucks transport the wastes from the primary collection points to the dumping site. These vehicles are sent to the field/sites depending on the demand from the fields. The number or frequency of trips taken by these trucks and compactors to the dumping site per day depend on the amount of fuel available and the weather condition, but not the volume or quantity of solid wastes generated from the community. Waste collected from different parts of Elele is transported on a daily basis to the dumping site, which is located about 13 kilometres away from the city centre. In some areas of the Local Government, there are no collection points. The garbage are collected right from the sources to the compactors and directly transported to the dumping site.



Treatment

There is no treatment of the generated solid wastes in the city. In the markets, when the wastes accumulate beyond the area specified as the collection point, they are burnt by either the waste scavengers/pickers or the waste generators. Some of the wastes generated from the markets contain hot ashes and some flammable and ignitable materials which ignite fire and hence burn the whole wastes in that collection site. This usually happens when the compactors delay the collection or missed the schedule. In residential areas closed to the water bodies/stream, the wastes are emptied or disposed into those water bodies (especially during rainfalls) and hence drawn into the main river.

Recycling

The country does not have a formally established recycling industry yet. The recycling of waste is done in an informal manner and in small scale. Thus, there is no market for recovered wastes. Waste collection had just started in Elele and the number of vehicles for collection has been insufficient for covering the whole city. In this sense, it is difficult for the government to initiate recycling which requires more vehicles. The largest amount of recyclables in Elele city are the plastic bottles. Other items for private recycling business are iron and aluminum, but their amounts are low in percentage for the whole waste composition.

Dumping/Disposal

The city does not have an operational secured disposal site, however, all the garbage collected from the city are dumped in the only dumping site constructed by the Local Authority at the outskirts of the city. This site is managed by the authorities of Phalga, which is not part of the Ikwerre Local Government Area. The Local Government Sanitation Authorities pays dumping fees to the administration of the dumping site. Prior to the official opening of this dumping site, wastes generated from the city are randomly dumped just along the main road. That space is surrounded by parcels of land that have been allocated to various public institutions of the Federal Government, areas of farmland and by scattered community settlements. It is the only official dumping site for Elele, and all the wastes that is collected from the city's households, market places, commercial institutions and even hospitals, are dumped in this site.

The Fiscal System

In managing the solid wastes, the department is expected to finance itself from the service charges it collects. The department charges the service beneficiaries according to the amount of wastes generated. The amount of waste chargeable is not weight or volume specific. There is no standard fixed to determine the charges, but rather it depends on the estimation of the officer in charge of the collection. However, shops, hotels and manufacturing industries are charged differently. Some public institutions do comply with the payment of the charges, but most do not. Due to this, the garbage collection is restricted to the business centres and the other entities which demand the service and then pays the Sanitation Authority.



Public and/or private institutions can sign contract with the Local Government Sanitation Authority to provide collection and transportation services, and the charges for this depends on the agreement between the Local Government Authority and the service beneficiary. The other source of revenue to the Sanitation Authority is the licenses fees charge from the private trucks which are engage on the works of garbage collection from the residential areas and some business centres. The department remits this money to the Local Government Council, then applies for funds from the council headquarters based on their needs, including payment of labourers, maintenance of trucks, fuel and providing other office needs. This same fund is also needed to be paid to the administration of the only disposal site in Kelga.

Challenges Encountered by the Department

The Sanitation Authority is yet to have an independent policy and legal frameworks for the management of Solid Wastes in the City. It is expected that the state ministry of Environment, which is the mandated public institution to cater for the management of Solid Wastes and related subjects in the state, develop a legal and regulatory frameworks that can be used by the Sanitation Authority to develop their own frameworks to be applied and enforced in the jurisdiction of the Ikwerre Local Government Area for Solid Waste Management. Financing the technical and the administrative aspects of the Solid Waste Management is one of the main challenges facing the Sanitation Authority. The financial support from the Local Government Council is not sufficient to run the management of the Solid wastes in the city. The Local Government Sanitation Authority does not have adequate technical and competent human resources. The technical and technological capacity needed for the management of the solid wastes generated from the city is inadequate to yield efficient outputs. The workforce and the labourers who are doing the collection and transportation of the garbage do not have appropriate safety materials. Those materials are provided by the Local Government Head Quarters upon demand from the department of environment and sanitation. The Local Government Head Quarters supplies the department with those materials, expecting the department to supply the areas depending on their weekly needs. The supply of those materials depends on the quantity and the type of the safety materials available. In most cases, the supply is less than the demand. Lack of transport facilities for the field coordinators has hampered the coordination and communication between the field and the head offices. This, subsequently, has limited the regular meetings between the head offices and the field officers. This coordination and communication limitation also affects the interaction between the department and the stakeholders/service beneficiaries, especially those who are supposed to pay for the service. There is no regular meetings between the department and the stakeholders as well.

CONCLUSION AND RECOMMENDATION

The increasing population of the city resulted to the increase in the volume of the wastes generated. The already understaffed department will not be capable to deal with the huge volume of wastes expected to be generated. The limited technical capacity of the department is an issue of concern. Solid Waste Management is everybody's



responsibility, as such, everybody has a role and responsibility in its management. The Federal government and state governments or the public institutions mandated to manage the solid wastes in the cities are very important institutions in the development of the policies, plans and laws pertaining to the management of solid wastes. The private sector and communities are important stakeholders in the management process of the solid wastes. For an effective integrated solid wastes management, clear demarcation of roles and responsibilities for these stakeholders is a prerequisite.

It is a participatory exercise which all stakeholders are expected to participate. If proper policies, laws and plans are developed, the management of the solid wastes will be an easy and effective exercise. And as a matter of fact, the wastes will be a source of sustainable funds for the department. The management of the solid wastes in the city is affected mainly by financial and technical deficiencies. Administratively, communication and coordination between the state ministry of health, environment and sanitation and the headquarters of the Local Government Council, the department of environment and sanitation, the field offices or Area offices and PHALGA is limited. However, the following recommendations are worth considering;

1. The Local Government council needs a legal mandate to enable it recruit technical staff in the field of solid waste management.
2. The department of environment and sanitation has to develop a comprehensive and applicable plan for solid waste management in the city.
3. Communication and coordination between the city council headquarters, the department of environment and sanitation, the zonal/field offices and PHALGA need to be strengthened. There is a need for frequent consultative meetings between them to help put the status of the solid waste management system under continuous review.
4. Approval of weekly budgets and release of funds to the department, for the continuity and sustainability of the service delivery should be given the priority, as solid waste or garbage collection generates funds for the Local Government council.

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