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POPULATION GROWTH, WASTE DISPOSAL AND MANAGEMENT PROBLEMS IN OMOKU, RIVERS STATE, AND ALTERNATIVE APPROACH TO WASTE MANAGEMENT FOR WEALTH CREATION

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Abstract

This paper examined population growth, waste disposal and management problems in Omoku, Rivers state, and alternative approach to waste management for wealth creation. To achieve the main objective of the study, two specific purposes and two research questions were posed to guide the study. Descriptive research design was adopted for this study in order to collect primary information in pictorial form for the purpose of describing the current wastes generated in Omoku and situation of waste disposal and management as well as the problems such practices may pose to the environment and human health. Secondary data in form of extensive literature review on best practices of waste disposal and management for wealth creation were done to cover sub topics such as: types of wastes, environmental and health issues for indiscriminate waste disposals, economic value of wastes components and current waste management practices around the globe for wealth creation. The findings show that wastes generated in Omoku are: organic and vegetative waste, commercial waste, household waste and industrial waste. The findings also show indiscriminate disposal of wastes along major roads, river banks, and water pond sites used as dumping in Omoku. Based on the environmental and health problems associated with the current waste disposal and management practices in Omoku, it was concluded that there is need to adopt proven best practices of waste management for wealth creation in the study area. Hence, the following recommendations were made among others: all wastes created should be separated and trashed in bin coded containers that indicates their types, places of worship like churches, mosque, schools, markets leaders, and companies, should assist in educating their adherents on the need to dispose their waste appropriately, finally, Omoku community should engage in waste management practices that can lead to wealth creation such as: recycling.

Keywords: population growth, indiscriminate waste disposal, waste economic value, wastes management, Omoku.

Introduction

In today's Nigeria, there is obvious increase in population size in most urban areas resulting from an influx of migrants from rural to urban areas for the purpose of getting means of survival. This high increase in migration has led to population boost in urban areas where there are vibrant economic activities that can support livelihood. This population boost comes with its attending effect especially as it relates to high rate of waste generation which in turn leads to improper collection and disposal of wastes (Ugwuanyi & Isife, 2012).

Wastes are referred to as unwanted materials generated by either households, industries, agricultural practices, commercial activities, construction institutions and so on (Konya, Zitte & Ugwulor, 2013). Wastes are generated on daily basis in different forms across urban and rural areas of every nation (Abila & Jussi, 2013). However, Olowaleye (2012) noted a steady increase in wastes in urban area as a result of population growth. It is worth noting unlike rural communities where waste quantity are less and well managed in household back yards by burning and composting the burnt wastes as manure (Abila & Jussi, 2013), thus urban waste have become problematic to manage. Supporting this fact, Ogwueleka, (2009) noted that about 25 million tonnes of municipal solid waste are generated annually in Nigeria which is made up of 0.66kg/cap/d in urban areas to 0.44kg/cap/d in rural areas. Most of these wastes in urban areas are generated either by domestic sources generally classified as household waste or through industrial and other socio-economic activities with classification such as industrial waste or hazardous waste, biomedical or hospital or infectious waste and electronic waste (Abila & Jussi, 2013). Generation of these wastes are inevitable because almost every human activities involves the generation of waste products either in gaseous, liquid or solid forms. Fundamentally, wastes generated in most urban areas can be attributed to the modernization and economic development activities, however there ineffective management poses great challenge to environmental and human health in urban areas (Nwaokobia, Ogboru, & Okolie, 2018). Little wonder did, Bohare (2018) opined that human settlements and resettlements in urban areas have greatly influenced the production of large amount of solid waste that are not properly managed. The current situation of improper management of wastes generated in urban areas has been associated to lack of adequate awareness on how to manage wastes and this has been identified to contribute to the damaging effects of the environments where people are living (Ogundele, Rapheal, & Abiodun, 2018). Thus, since increase in population is inevitable because of the continuous rural-urban migration, there is need to create awareness of proper and alternative means of managing urban wastes for wealth creation.

Statement of the Problem

Indiscriminate disposal of waste materials has various environmental impacts, thus can cause huge problem to human, animals, plants and the community at large. Indiscriminate disposal of waste on either land or water often becomes infectious to human health, which can cause different diseases such as skin and blood infection, eye and respiratory infection and other diseases that could emanate from vector borne diseases (Oluwaleye, 2012). Improper disposal or handling of waste could also pose serious environmental and health issues especially on those workers that are involved in the field. It can also promote vectors

like flies, mosquitoes, cockroaches, rats, mice, odour problems etc (Hammed & Sridhar, 2014). Additionally, the environmental problems caused by wastes include global warming (Kamalan, Ave, & Golzar, 2016), and eutrophication (Debruyne, Wilhelm, Ludwig, & Boyer, 2013) etc. Some of these problems could be as a result of the content of nitrogen, phosphorus and sulphur. Some toxic heavy metals such as lead, mercury, cadmium and other manmade synthetic chemicals present in the waste generated may also result to poor health, diseases, that may eventually lead to death (Hammed & Sridhar, 2014).

Unfortunately, indiscriminate waste disposal is evidence in many part of Omoku communities. Thus, if the unwanted materials emanating from indiscriminate waste disposal are not removed from many parts of the community, they can result to the pollution that can pose environmental and health risk to people. Therefore, to curb the problems associated to indiscriminate waste disposal and management in Omoku resulting from population boost and economic activities, the present study was intended.

Objective of the Study

The main objective of this study is to examine population growth, waste disposal and management problems in Omoku, and alternative approach to waste management for wealth creation. Specifically, the study seeks to determine:

- i. Current types of wastes generated from Omoku households.
- ii. Current wastes disposal and management practices in Omoku.

Research questions

The following research questions were posed to guide the study:

- i. What are the current types of waste generated from Omoku households?
- ii. What are the current waste disposals and management practices in Omoku?

Review of Related literature

Types of Wastes Generated in Nigeria

Wastes can be classified into the following:

Organic and Vegetative wastes: These are classified as wastes generated from plants and animal remains. They include, cassava peels, yam peels, banana peels, potato peels, plantain peels, decomposed fruits or fruit peels, onion peels, vegetable stalk, etc. This could be either from processed food such as wastes from households or restaurants or unprocessed food generated from poor handling of food materials as they are transported from the farm to the market. These wastes are found at dump sites already decomposed and mixed with other forms of wastes (Kingsley & Kingsley, 2012).

Municipal or household wastes: As the name implies, these type of waste can be generated from household, offices, hotels, shops, schools etc. They include newspaper, batteries, product packaging, grass clippings, bottles and tin cans that are hazardous to the environment (Oluwaleye, 2012).

Industrial wastes: This type of waste is generated by human activities in the industries, they include oil, solvents, gravel, masonry, scrap metals, paints, sandpaper etc. This particular type of waste may occur as pure or mixture of complex substances that

vary in different composition and physiochemical states which significant proportion of it is regarded as toxic waste, therefore requires special handling, treatment and disposal. Their sources are from thermal power plants that produces the following, ash, iron and steel mills that produces blast furnace slag and steel melting slag, sugar industries generating press, mud, pulp and paper industries that produces lime and fertilizer etc (Oluwaleye, 2012).

Construction and demolition wastes: This type of waste is generated from building and construction activities such as roads, bridges, flyover, or removal of construction. They are made up of inert and non-biodegradable material such as concrete, plaster, metal wood, plastics etc (Oluwaleye, 2012).

Electronic wastes or E- wastes: These type of waste includes old fridges, computers, phones, old machine parts, television etc. They are described as discarded electrical devices. They contain both hazardous and non hazardous substances in their components. They can also be reconstructed, re-used or re-sold through material recovery.

Commercial wastes: These are unwanted waste generated from different sectors like stores, hotels, restaurants, institutions, banks, hospitals, nursing homes, public or private sector etc. They include, packaging materials, news papers, cardboards, jars, bottles, containers, bags, metals, cartons, furniture etc. These waste make up a significant portion of 23% municipal waste (Oluwaleye, 2012).

Hazardous wastes: These are dangerous and harmful waste materials that are harmful to human health, animals, and plants or to the environment which requires a careful control system by necessary body. It includes, paints, solvents, used motor oil, pesticides, propane cylinder etc. They can be in the form of either liquids, solids, or contained gases which are either from by-products of manufacturing processes or discarded unused commercial products such as pesticides or cleaning fluids (Oluwaleye, 2012).

Current Waste Management Practices in Nigeria

Open burning: This is an ancient method of waste disposal that involves setting waste on fire in an open environment. This method could create environmental pollution problems such as fire explosion, air pollution and depletion of ozone layers due to the release of aerosols to the atmosphere during the process (Amusan et al., 2018).

Dumps and landfills: Landfill refers to an area of land where waste materials are buried. This is the cheapest and simplest method of waste disposal, thus creates job opportunities for scavengers. However, this method also poses negative effects on human lives, animals and plants and makes the environment unsustainable owing to the emissions of poisonous gases like methane carbon monoxide, and ammonium (Kamalan et al., 2016).

Solid waste packaging: All solid wastes require to be selected and packaged well before disposing them. In this method, there are specified containers such as steel bin, plastic bin, polythene bags etc that are often used in refuse packaging to prevent emission of poisonous gases like methane, carbon monoxide and ammonia that could cause harm to human health in the environment (Kamalan et al., 2016).

Recycling of waste: According to Ghisellini, Cialani, and Ulgiati (2016), waste recycling refers to the end of life recovery of materials with value and their reprocessing into a new product for continual usage of the material. This method is an environmentally friendly option and through it the consumption of resources are reduced and the potential resources are conserved and converted to useable items which could be referred to as converting waste to wealth (Stahel, 2016). This method is informally done by scavengers who buy un-use valuables from people and also search for some valuable materials that can be recycled from legal and illegal dump sites (Abila & Jussi, 2013). Its disadvantages include the neglect of product's quality and its efficiency and lack of energy recovery. The materials used are sourced from different locations and sorted depending on the type of waste either hazardous waste, animal waste, household waste, chemical waste, electronic waste, biodegradable or non biodegradable waste etc (Ogunmakinde, Sher, & Maund, 2019).

Incineration: This method tends to dispose waste through combustion at a high temperature on site. It is the most costly and effective municipal waste disposal often practiced in Nigeria hospitals where medical wastes are destroyed by burning at a minimal scale (Ogwueleka, 2009). It aids in the reduction of waste and produces electricity and heat energy, on the contrary, it causes air pollution in the form of acid rain and ash production (Ogunmakinde et al., 2019).

Composting: According to Hammed & Sridhar, (2014), it is a process where aerobic biological activities such as organic wastes are mixed with municipal wastes, crop residues or saw dust and kept in windrows for several weeks for degradation by microorganisms. This involves decomposition of organic waste by natural microbial organisms. This method can cause global warming by producing methane gas and carbon dioxide in the environment (Ogunmakinde et al., 2019).

Economic Value of Components of Wastes Generated from Households

Components of waste	Economic value
Plastics, cans, papers, ceramic plates, aluminium, weavens etc	All plastics can be shredded, ground and melted to produce molten aluminium.
Cartons, rubbers, baskets, etc	Cartons and rubbers can be recycled into original products, and baskets can serve as fuel for cooking
Vegetable stems, kitchen wastes, garbage, fruits, animal wastes etc	They can be recycled and used as compost manure to enhance plant growth
Nylon bags, syringe, needles, drip bags etc	They can all be recycled into their original products
Leather, tins, packaging materials, cans, plastic bottles, animal bones, wood etc	Leather, plastic bottle, can be recycled into original products, sawdust from wood can serve as fuel, and animal bones can be used to produce household vim.
E-wastes such as Old fridges, computers, phones, old machine parts, television etc	They can be collected separately and transported to recycling plants for detaching and recycling into different related new products that will be of

	value.
Old clothes, wires, concretes, old furniture etc	Clothes can be reused, wires, old furniture can be recycled and re-used, or its parts can be reconstructed and into another wooden work ,concretes can be grinded in to pieces and used for construction of new houses and glasses can be recycled into their original products

Table 1: Components of wastes generated their economic values.
Source from (Konya, Zitte, & Ugwulor, 2013)

Alternative Approaches of Waste Management For Wealth Creation

Establishing Community-based waste bin coded containers for sorting and collection in Omoku: For a successful recycling, separation of wastes should be the first step at every household level in Omoku. There should be provision for three colour-coded waste sorting containers to virtually every household in Omoku to sort their waste. For instance, papers and cartons can be deposited in one of the colour coded waste bin container, all plastics of different kinds can be kept in another waste bin container, kitchen waste such as yam peels, potato peels, plantain peels, banana peels, and animal wastes can be separated and kept in a different bin coded container before the clearing agent or chart pushers arrives to pick them up. This method has been proven in Anambra state, Nigeria where community based waste sorting and collection was established and proved effective (Sekhran, Adriana, & Jacques, 2015). When wastes of valuable materials such as aluminium are disposed properly in their containers, they can be recycled and, converted to cooking pots, plastics transformed into plates and spoons, chairs recycled in to new products, broken bottles recycled in the industries where they end up again as good and clean bottles. Thus this will promote reduction of waste and enable scavengers to save some money from recycling industries.

Recall process: Manufacturers and companies, can aid in reducing waste by introducing a recall process that will reward individuals who returns empty used plastic containers such as paint buckets, cement bags, etc. This method can motivate every user to return empty containers to the manufacturing companies.

Developing Composting Method in Omoku: This is a process where aerobic biological activities such as organic wastes are mixed with municipal wastes, crop residues or saw dust and kept in windrows for several weeks for degradation by microorganisms. Since Nigeria is an agricultural producing country where varieties of food are imported, it is advisable to mobilize, enlighten, and create awareness to farmers in Omoku community on the importance of recycling through composting. With regards to this, it is necessary for all the organic and vegetative wastes to have a particular container or bag they are kept. The compost waste can be taken to the compost plant industries for processing into organic fertilizer, for farmers and horticulturists, and the finished product is a good soil conditioner which is ideal for Nigerian soil used to enhance plant growth. Thus, this method has proven effective at the university of Ibadan, where composts prepared from various wastes were used to grow different types of crops

like, yam, maize and papaya (Sridhar, Adeoye, Omueti, Yinda, & Reece, 1993).

Methods

Study Area

Omoku is a town in Onelga Rivers State, Nigeria with a Population of about 32,000 people. It is located in the northern part of the state, near the boundary with Delta state and Imo State. It is one of the major urban area in Rivers State, which is located between latitude 5° 20' 37.97" N, longitude: 6° 39' 24. 62" E. There are host of oil and construction companies such as Agip, Setraco, Nestoiletc. There are also a host of other commercial organizations in the town ranging from educational centers, hotels, religious organizations, etc. The major form of public transportation is the motorcycle, popularly known astry-cycle and okada. In recent times, there has been a great migration from other part of the community in general, making the town a habitat comprising of all major tribes in the country including foreigners who come for investment and expatriate purposes as seen in the presence of the oil and construction companies, and consequently contributed to the volume of waste generated in the area. Trading is also one of the major activities of the people in the area, ranging from petty trading to large-scale outlets. This can visibly be seen in the various markets in the town known as Omoku mainmarket (old) and Omoku new market, which plays host to a large number of traders coming from the towns and its environs. This also has encouraged the indiscriminate disposal of waste in this community. It is possible that the residents are ignorance of the dangers associated with indiscriminate waste disposal to their health and to the environment. It is for these reasons that the researcher chooses this area for the study.

Research design and sources of information

Descriptive research was adopted for the study. The descriptive research was deemed appropriate since it allows the researcher to describe the current situation of waste disposal and management in the study area based on primary information sourced from the environment. Secondary source of information was also utilized to identify best practices of waste management that can result to wealth creation.

Results/Discussion

Research Question 1: What are the current wastes generated from Omoku households?

Figure 1: Pictures of different types of wastes generated in Omoku households



Fig.1 Shows industrial waste material along road Omoku



2 Shows household waste along Obor road Ikiri Omoku



Pic. 3 Shows compost waste peels of cassava along river bank of Ewoh/ Usomini Street Omoku

Source: Omoku community waste sites

Research Question 2: What are the current wastes disposal and management in Omoku?



Figure 2: Shows current waste disposal practices in Omoku.

Source: Omoku community waste sites

Discussion of Results

Figure 1 shows different pictures that provide primary evidence of the kinds of wastes generated by the populace living in Omoku through their various domestic and industrial activities. Picture 1 collected from dump site along Ikiri road Omoku showed evidence

of industrial wastes which comprises of saw dust from wood, cartons, plastics, tin cans, broken ceramic plates, weavons, rubbers, baskets etc. Picture 2 collected from household waste along Obor road Omoku showed evidence of spoilt food and fruits, animal wastes, plastics, tin tomatoe cans, milk and milo tin cans, egg shells, animal bones, onion peels, pieces of clothes, papers, broken bulbs etc. Picture 3 collected along Ewoh/Usomini Street Omoku showed evidence of compost wastes such as cassava peels, yam and potato peels. Picture 4 collected along Eckankerstreet at Ikiri road Omoku showed evidence of commercial wastes such as nylon bags, syringe, drip bags, cartons, foams, aluminium, wires, plastics, broken bottles, leather etc. From these primary evidences, it can be concluded that wastes such as plastics, cartons, rubbers, leathers, nylon bags and drip bags can be recycled into original products, baskets and sawdust from wood can serve as fuel for cooking, egg shells and animal bones can be grinded smoothly into powdered form to produce household vim used to wash pots and kettles, cassava peels, yam peels, potato peels, kitchen wastes and animal waste can all be used as compost manure to enhance plant growth as this is in accordance with (Konya, Zitte, & Ugwulor, 2013) that stated that all the above can be recycled and used to create wealth.

Figure 2 shows pictures that provide current practices of waste disposal in Omoku. Picture 1 indicates the current practices of waste disposal in water pond of Eckankerstreet along Ikiri road Omoku. The wastes deposited in water ponds of Eckanker street comprises of different wastes from commercial, industrial, household and compost waste which can excessively add nutrients such as nitrogen and phosphorous from compost waste, fertilizer from industrial waste, and manure from animal waste and stimulate the growth of harmful algal blooms when they end up in the pond and pollute the surface of the water which can be harmful to the environment, thus, this is in agreement with Debruyn, Wilhelm, Ludwig, & Boyer, (2013). The water pond can also be polluted by some other substances from industrial waste such as heavy metals, and chemicals that get dissolved and suspended in it and contaminate the pond. The contaminated water can leach to other water sources, contaminate them and cause respiratory illnesses, nervous disorders, liver and nerve damage, skin eruptions, vomiting, fever and fatal abnormalities to the people living in the environment, which is plausible to Nartey, Hayford, & Ametsi, (2012), Ologundudu, Adewunmi, Ololade, & Adeleye, (2009) and Michael & Ochege, (2014).

Picture 2 shows evidence of burning of wastes disposed at the dump sites along Obor road Omoku which comprises of different kinds of wastes such as plastics, clothes broken bottles, foams, papers, baskets, etc. From these primary evidences, it can be concluded that burning of wastes in an open environment is a common practice of waste disposal in Omoku. Therefore, it is important to know that, when these wastes are burnt, they emit carbon monoxide that suspends in the air which can cause harm to the eyes and respiratory tract illnesses, such as difficulty in breathing, bronchitis, asthma, cancer, etc to passerby or people living around where wastes are burnt. Additionally, according to Hamid, Usman, & Zubair, (2010), carbon monoxide has also been reported to cause decreased haemoglobin's oxygen-binding to individuals exposed to carbon monoxide.

Therefore, improved waste management can aid in reducing local water pollution, reduction of carbon monoxide emission, and also support job creation and sustainable livelihoods in Omoku rivers state.

Recommendations

Based on the findings of this study, it is observed that waste generation is every one's business. Therefore, the following recommendations are put forward for implementation:

- There should be stoppage of waste disposal in the ponds, and all the wastes already deposited in the ponds can be evacuated gradually, and the pond should be made free from wastes and treated or purified.
- The community leaders or Government can create job opportunities by using this pond to empower the community youths. This can be achieved by using the ponds to start up a fish farming business for eight months. Thus income can be generated from selling of the fishes after eight months.
- Omoku community should adopt the culture of converting waste to wealth through establishment of recycling plants which can provide employment opportunity for their teeming idle youths.
- Vegetative and composting method of waste disposal can be adopted by Omoku local farmers to enhance plant growth.
- Every waste generator in Omoku should learn how to separate their wastes in coded bin containers so as to avoid mixing wastes that can be recycled with those that can be decomposed.
- Omoku environmental planning agency should provide closed containers or coded containers that can be used to separate different types of waste and prevent the exposure of waste so as to avoid the spread of diseases through flies and mosquitoes.
- Places of worship in Omoku like churches and mosque should assist in educating their adherents on the interrelationship between humans and the environment and the need to dispose their waste appropriately at the designated areas
- Omoku youth association needs to conduct adequate public enlightenment on proper waste disposal so as to prevent indiscriminate waste dumping.
- Involvement of environmental management agencies requires collaborating with Omoku youth association and the local council should be welcome to aid in waste management.

Conclusions

In Nigeria today, as the population increases waste creation also increases, because nearly everything we do generates wastes. Thus, every person is a potential generator of this problem, therefore, every individual have a role to play in waste management. The waste created is one thing, the type of waste generated is another thing, and the ways it should be managed is a different issue, thus it has been a great challenge in Nigeria. Therefore this calls for an effective management system so as to help facilitate sustainable development through recycling of waste products for wealth creation.

Environmental health officers can promote waste management by creating awareness through the mass media on the implication of wrong disposal of wastes at our individual homes, organization, churches, mosque, schools and companies and it should be done in a clear and simple language. Most of the wastes generated in

Omoku can be converted via recycling plants which should be established in the community. These plants can be established through governments or public private partnership initiative in Omoku to help reduce the quantity of waste that ends up at the dump sites. There is also need to make proper arrangement for bin coding containers so as to store and collect wastes specifically for recycling and composting, and to bring them back into cycle of life, in order to maintain ecological harmony.

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