Statistical Analysis of Some Barriers to Market Waste Management in Federal University Lokoja and its Environment

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ABSTRACT

The reason for this statistical study is to conduct an analysis to extract barriers to market waste management in federal university Lokoja and its immediate environment, government and community response and its effectiveness. The study area is Federal university Lokoja, markets and the community that host the federal university Lokoja. Market activities (Buying, selling and consumption) can generate different kinds of hazardous and non-hazardous wastes to the surrounding. It was noticed that mismanagement of wastes often results ejecting dangerous chemicals to the environment and this causes health issues for human being. This waste can be inform of industrial chemical and market waste. Lokoja is the state capital of Kogi states, resource-constrained, policy & implementation deprived, infrastructural inadequate and lacks the technical know-how when it comes to the efficient and sustainable management of market wastes. Past studies concluded that regulations and legislations focusing on waste management and environmental sustainability are not well formulated Lokoja, implemented nor adhered to by many people concerned. Moreover, wide loopholes and gap exist in waste generation, waste management practices and government policy. There is a lackadaisical attitude from government agencies in charge of waste management Lokoja. The services provided by these government agencies are described as being irregular. So far, waste management in Lokoja is the sole government responsibility. Furthermore, markets in Lokoja suffer from inadequate waste segregation, collection, storage, transportation and disposal practices which can lead to occupational and environmental risks. Knowledge and awareness regarding proper waste management remain low in the absence of training for agency staff and the market community. Overall, market waste management in Kogi state faces several challenges ranging from agency, policy, funding, facilities, implementation, adherence and health. For any sustainable development in Lokoja, proper waste management practices must be sustained and the harmful effects of wastes chemicals contained, hence Kogi state government must take action.

Keywords: Waste management, Harmful chemicals, Dumping sites, Federal University Lokoja, Control and Implementation.

INTRODUCTION

Lokoja is the capital of Kogi State, the state was created in 27th August 1991 by former president Ibrahim Babangida. The name was derive from a river. Lokoja is one of the major concerns, it is currently estimates on the quantity and typology of waste generated in Lokoja to be 8000tn/per week and disposed of are grossly lacking. This gap in knowledge constitutes a cog in the wheel of effective planning and management of waste

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in the Kogi State. An interesting case is Lokoja, the hub of tourism industry in the North central zone of Nigeria, popularly known as former capital of Nigeria, lord Lugard house, where the sector is presently under threat as a result of poor waste management. Efforts to implement an integrated solid waste management programme are hampered by lack of current estimates on the quantity of waste generated and disposed of in the area (Nwosu, & Nwachukwu, 2021). In the history of Kogi State, the market waste parastatal created so far includes Environmental Transformation Commission, Kogi State (ENTRACO), as the leading agency in charge of waste and environmental management in Kogi State, Notable among the government agencies in charge of the environment include:

- National Environmental Standards and Regulations Enforcement Agency Kogi State,
- Federal Ministry of Environment (FMOE) Kogi State,
- State Ministries of Environment Kogi State,
- Kogi State, Ministry of Petroleum & Environment,
- Kogi State, Environmental Protection Agency,

  Kogi State Bureau for Sanitation & Transport,
- Waste Management Society of Nigeria, State Environmental Protection Agencies (SEPAs),

  Kogi State, Environmental Protection Agency Law,
- Environmental Transformation Commission, Kogi State, (Lokoja ENTRACO),
- The Lokoja Waste Action Plan (OWAP) 2020,
- Kogi State, Initiative on Generated Waste (ISIGW) 2021,
- Convention for the Protection and Development of the Water Environment in Kogi State, (CPDWEIS),
- Final Protocol Concerning Pollution from Land-Based Sources and Activities (FPCPLBSA).

Despite the numerous efforts by the government, the problem of waste management does not improve. The citizenry persistent with the old ways of refuse disposal. The regulations and legislations that govern solid waste management in Nigeria are not yet to be effectively enforced, nor has it been well understood and accepted by Nigerians (Ogwueleka, 2009).

The increase in market waste generated in Lokoja has not been accompanied by a corresponding growth in the capacity, Policies and funding to manage it (Ziraba et. al., 2016). The fast developments in Lokoja have witnessed drought, employment and low economic development of the people of the state but has also had problems with environmental problems, congestions, stiff competition on the use of land. The betterment in the people's standard of living over the past decade is accompanied by increased resource use and, consequently, a large amount of waste generated from everyday activities. Nwachukwu et. al., (2018) reported that because of rapid urbanization, the volume of waste produced inside the city and commercial centres increases and has become a significant worry for residents and the administration. Lokoja city is deficient in handling the requirements of mounting urbanization in the state. Waste is a severe concern in Kogi State at present (Maiyaki, Marzuki & Ahmed 2019; Onu et. al., 2012).

Despite all effort made by the Kogi State Government and several researchers, waste control in Lokoja is still a major gap not yet addressed. Lokoja has large percentage area of water and some people dump waste in the riverside while some other area includes mountains and settlement. Improper waste disposal has resulted into problems such as health hazard, market traffic congestion, unsightliness, unpleasantness and blockage of drainages are some of the problems caused by the lack of efficient waste management practice in Lokoja. The

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major problem in Lokoja is how to identify a model that best describe the policy that can solve the problem of market waste management in Lokoja, Kogi State, Nigeria (Ibe, Opara, Amaobi, & Ibe, 2021).

LITERATURE REVIEW

Waste management has being a major issue arising in the world for ages. In 2016, the worlds' cities generated 2.01 billion tonnes of solid waste, amounting to a footprint of 0.74 kilograms per person per day. With rapid population growth and urbanization, annual waste generation is expected to increase by 70% from 2016 levels to 3.40 billion tonnes in 2050. Around the world, waste generation rates are rising. In 2018, the worlds' cities generated 2.01 billion tonnes of solid waste, amounting to a footprint of 0.74 kilograms per person per day. With rapid population growth and urbanization, annual waste generation is expected to increase by 70% from 2016 levels to 3.40 billion tonnes in 2050. World Bank has committed over $4.7 billion to more than 340 solid waste management programs in all six regions of World Bank engagement. Recent committed to lending technical assistance for waste management (Nwosu, & Nwachukwu, 2021). The developed nations, residents in developing countries, especially the urban poor, are more severely impacted by unsustainably managed waste. In low-income countries, over 90% of waste is often disposed in unregulated dumps or openly burned. Poorly managed waste serves as a breeding ground for disease vectors, contributes to global climate change through methane generation, and can even promote urban violence. Managing waste properly is essential for building sustainable and liveable cities, but it remains a challenge for many developing countries and cities. (Marzuki & Ahmed 2019; Onu et. al., 2012).

The market is a site at which people meet regularly go to buy and sell locally produced and imported goods and services, to exchange information with relatives, friends and strangers, and to engage in recreational activities (Nwosu & Nwachukwu, 2021). The market is an integral part of the town, the centre from where transport system and activities spread in various directions. Apart from offering cash reward through trading, the market strengthens the economic base of the town and sustains the tax base of the local authorities. Most of the ancient towns in Kogi State were tied up with the establishment of the market. Despite the importance of markets in Nigeria, the quality of their environment is deplorable and craves improvement. There is an extreme congestion of dumped garbage and other waste at corners and open drains around the markets. There is no organized system for the collection, transport and hygienic disposal of the waste which is continually generated in the state (Nwosu & Nwachukwu, 2021). The common features of markets in state are unavailability or inadequacy of essential facilities such as potable water, toilets and refuse disposal bays, poor layout. The utilization of market waste product as resources has been affected by so many factors. These factors are preventing this market waste from being re-use and recycled. Lokoja, one of the largest indigenous city in tropical Africa and capital of Kogi State. Prominent study was carried out to mobilize market traders to plan and initiate a waste management strategy in the market. Pre-intervention activities involved a collection of baseline information on demographic and socioeconomic characteristics and on the knowledge, attitude and practice of traders towards waste handling and disposal.

Waste control in Lokoja is still a major gap not yet addressed. Improper waste disposal has resulted into injecting chemicals to the society causing problems such as health hazard, market traffic congestion, unsightliness, unpleasantness and blockage of drainages are some of the problems caused by the lack of efficient waste management practice in Lokoja. The major problem in Lokoja is how to identify a model that best describe the policy that can solve the problem of market waste management in Lokoja, Kogi State, Nigeria (Ibe, Opara, Amaobi, & Ibe, 2021).

According to Kaza et. al., (2018), rubbish, garbage, wastes or refuse are referred to as materials that are ordinarily not required and are monetarily pointless or unusable. Lately, wastes are no longer monetarily pointless but actually a lot of money could be generated from waste processing/recycling through waste management is the collection, transportation, and disposal of garbage and other waste products. Waste management involves the handling of waste materials from the time it is made to their removal. According to Maphosa and Maphosa (2020), waste management is a systematic action for managing waste from its origin to its final disposal. Waste management involves many processes such as collection, transportation, dumping, recycling, or sewage treatment, among other waste product monitoring and regulatory measures.

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According to Lu Zhang et. al. (2015), the concept of waste management is more often discussed now than decades ago when direct waste disposal was in practice. Researchers are currently exploring the economics importance of waste since waste generation is an unavoidable product of man's activities (Chakrabarti & Sarkhel 2003). Previously, the community simply dug a hole and buried their refuse and waste. This was an effective technique for these early people because their population was relatively small. They did not generate waste on the same scale or with the levels of complexity that modern humans do. Burying the rubbish helped to prevent bugs and rodents from becoming a nuisance and spreading diseases. Nigeria is one of the most significant contributors to solid waste in Africa, with an estimated 32 million tons each year (Ike et. al., 2018). The biggest issue in waste management in Nigeria is expensive logistics, making waste management pretty expensive ((Ike et. al., 2018). Solid waste management is the most pressing environmental challenge facing urban and rural areas. Nigeria's population is estimated to double by 2050, and that could mean more solid waste hanging around and more plastic for recycling.

In Nigeria, specifically, the issue of waste management and control has increased at a very high rate. This is partly due to the upsurge or rise in population growth and industrialization (Yusuf, Kamaruddeen, & Bahaudin, 2016). According to a recent study by Ike et. al. (2018), Nigeria has about 200million, produces 42 million tons of waste annually. Solid waste is the most generated waste in the country, and it is reported that an estimated 32million tons of solid waste are generated annually. This figure is the highest in Africa. How to channel these wastes becomes a massive problem for the country. According to a 2017 study conducted by the United States Environmental Protection Agency (EPA), the USA (population approximately 328.2 million) produced 258 million tonnes of MSW in 2017, while China, the most populous country globally with over 1.383 billion people, only generated 210 million tonnes of waste.

According to Ajibade (2007), Nigeria, among other developing nations, lacks sufficient resources to handle and dispose-off its wastes in an environmentally safe approach. The waste management problem persists despite efforts from different government agencies. Market waste was heightened with the increase in population, high consumption and usage of consumer items and packaging materials. The Lokoja city had experienced rapid urbanization in recent years, and this is accompanied by increased environmental problems that need urgent attention.

However, sustainable management of such waste is a challenge faced in different part of the country (Pariatamby et. al., 2019). The composition of market waste is more complex than ever. This is due to increased population, urbanization, and change in taste of people. (Vij 2012; Vergara & Tchobanoglous 2012). The study by Vergara and Tchobanoglous (2012) showed an increased charge to manage waste in a socially and environmentally acceptable manner. The strategy adopted to manage waste also depends on the characteristics of waste generated, local peculiarity and institutional capacity. Therefore the way waste is managed, collected and treated depends on location and locality.

In a similar study, Kumar et. al., (2017) investigated the challenges and opportunities associated with India's waste management. Just like in Nigeria, the current system in India cannot cope with the volume of waste generated because of the increasing urban population, and this have a significant impact on health and the environment. Kanat (2010) also assessed the waste management situation in Istanbul and concluded that strong governance and institutional involvement is necessary for effective waste management. Vidanaarachchi et. al., (2006) reported that in Sri Lanka, the waste management issues and policy are similar to those in Nigeria and most developing countries. The study revealed that only 24% of the Sri Lanka households have access to waste collection and that in rural areas, it was less than 2%. Communities' soles depend on government and authorities to handle waste management with low private sector involvement. According to Maphosa and Maphosa (2020) reported that electronic waste management is particularly of concern in sub-Saharan Africa which have become the primary destination for used electrical and electronic equipment. The study revealed that lack of policy and limited recycling infrastructure were the main barriers to effective e-waste management, and also that traditional methods of waste management that are currently in used is not sufficient. A new policy approach and strategy is needed. Previous studies in Nigeria have addressed solid waste management problems in cities such as Benin City, Lagos, Abuja and Jos city, where they report improper solid waste management (Sefouhi et al., 2010). The poor management of solid waste often impairs animal and human

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health in most cities in emerging economies and eventually led to environmental, economic and biological losses (Sharholy et al., 2008).

Ezedike et. al., (2020) conducted a study by assessing the health-seeking behavioural pattern of women traders on waste management in major urban markets in Owerri. The study recognized that vegetable and plastics are the most common waste type among the surveyed market women (prevalence of solid market waste). It was also revealed that the government was identified as the main evacuator of waste from the markets. The study concluded and elaborates the need for more awareness creation on waste management that adequately considers health attitude in Nigeria, especially among market women who are very resilient micro-economic drivers; they can only be productive when they are in good health (Ezedike et. al., 2020)

But waste control in Lokoja is still a major gap not yet addressed. Improper waste disposal has resulted into injecting chemicals to the society causing problems such as health hazard, market traffic congestion, unsightliness, unpleasantness and blockage of drainages are some of the problems caused by the lack of efficient waste management practice in Lokoja. The major problem in Lokoja is how to identify a model that best describe the policy that can solve the problem of market waste management in Lokoja, Kogi State, Nigeria (Ibe, Opara**,** Amaobi, & Ibe, 2021).

METHODS AND MATERIALS

This aspect detailed the development of the methodology adopted in this study in order to achieve objective one and two. The first objective which is to provide and identify the barriers militating against sustainable market waste management policy in Lokoja. The second research objective of this research which is to investigate the waste streams' resource potential and extent of waste utilization as a resource (Re-use/Recycle of waste) in Lokoja.

It is established in the study of Green (2014) that selecting a design for any study or research should be that which best suit the research in order to get an answer to every proposed research question. In this research, the researcher carried out a qualitative research design conducting statistically exploring the perception of the inhabitants of Lokoja community and provides answers on how these market wastes can better be handled in Lokoja community. Qualitative research is a subjective and systematic method to explain human encounters (Lockwood, Munn & Porritt, 2015). Qualitative approach focuses more on the quality of data obtained and analyzed and less on quantity of the same within the topic of study (Bryman, 2004) to the end of finding answers to research questions via studying society and its inhabitants (Berg, 2009). Apart from the literatures, data was collected from participants in the field and those engaging in waste management. This provides an overview of the issue and understanding of the process and challenges that follows. Specifically the study have an in-depth interview on respondents which was randomly selected from the following background:

a) 15 market traders,

b) 15 residents of Lokoja Kogi state,

c) 5 government officials in charge of the waste management.

During the in depth interview, the study likewise gather demographic information, background, experience, and their roles related to waste management. Finding out the challenges that they face, the potential of utilizing waste as a resource, perception on government policy formulation, implementation and evaluation; as well as the reasons why the culture of indiscriminate waste is still a problem until now.

I) This study employed a qualitative approach, as bases on interview that will enable social interaction that will make the respondents to provide their knowledge, understanding, roles, believes and attitudes on effective waste management activities in Lokoja. Qualitative approach focuses more on the quality of data obtained and analyzed and less on quantity of the same within the topic of study (Bryman, 2004) to the end of finding answers to research questions via studying society and its inhabitants (Berg, 2009). Similarly, Green (2014)

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established that selecting a design for any study or research should be that which best suit the research in order to get an answer to every proposed research question.

II) The study developed a questioner to understand the barriers militating against sustainable waste management in Lokoja. Doing so, this study first conduct a comprehensive investigation of the issue pursued. The first research question was initially addressed through the exploration of secondary evidence (scientific and grey literature: books, journals, research project reports, guidebooks, manuals, handbooks, online resources, reports by teams of experts writers or authoritative bodies, commentaries or blogs and online learning, relevant web posts by credible writers etc.).

III) Apart from the literatures, data was also collected from participants in the field (new market, old market, Pata Market, Ganaja market etc) and those engaging in waste management. This provides an overview of the issue and understanding of the process and challenges that follows. In total 15 people to be interviewed. Specifically this study conducted an in-depth interview on respondents which was randomly selected as follows.

IV) Qualitative approach focuses more on the quality of data obtained and analyzed to finding answers to research questions via studying society and its inhabitants. In the in depth interview, the study gather demographic information, background, experience, and their roles related to waste management. The interviewers also find out the challenges that they face, the potential of utilizing waste as a resource, perception on government policy formulation, implementation and evaluation; as well as the reasons why the culture of indiscriminate waste dumping is still prevalent in Lokoja.

V) The researcher decides to use an open-ended interview because it allow the participant to discuss and express their views, opinions and experiences in details. An in- depth interview method are also chosen so that respondents may convey their perspectives on certain occurrence and experts of their own experiences (Fetters, Curry &Creswell, 2013).

Qualitative data analysis occurs in three phases: description, analysis and interpretation (Burns and Grove, 1999). The data gathered will be transcribed, coded, analyzed and verified to identify thematic interpretations guided by the research questions (Patton, 2002). The last aspect of the study has to do with reporting the research findings, concluding the research and recommending a future direction of the study.

VI) A proper theoretical background was developed to design and implement the most suitable waste management system. Various researchers have used different theories in supporting work on waste management studies. Waste management theory explicitly talks about waste and waste management (Ibe, Opara, Amaobi, & Ibe, 2021). The waste management theory is based on the expectation that waste management will avoid harming human health and the environment and encourage optimising available resources (Heidari et. al., 2018; Chen et. al., 2017). The waste management theory involves the concept of minimizing waste and/or the use of resource optimization objectives and values (Pongracz, Phillips & Keiski (2004).

VII) The Waste Management Theory is based on the fact that waste management is designed to avoid waste that damages human and environmental health. That waste management application leads to resource conservation. Industrial Ecology, however, succeeds in integrating waste reduction with resource optimization techniques and ensures the efficient circulation of resources within biodiversity (O'Rourke et. al., 1996). Nikolaienko (2019) assert that there must be cost-efficiency in any waste management approach in play as a move for sustainability. Implementing strategy/practices for solid waste management can vary for residential and local communities and based on the type of waste created. Hence, a locality-based study like this is necessary for Kogi state (Nwosu, & Nwachukwu, 2021). The new theory of production with waste and recycling at its core is being advocated for in some countries. The theory noted that product responsibility assumes that a product follows its manufacturer from the cradle to the grave; it is the firm's duty to ensure avoidance, recycling and disposal of waste. In some countries like Germany, a manufacturer is expected to raise awareness on the producer's side of a circular flow of his product from virgin material to scrapping. Therefore, Waste reduction, waste recovery and waste disposal will also form an essential part of the

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manufacturing process. Other countries practice an efficient production scheme in which recycling or re-use waste is a by-product of their production process.

Investigation on the waste streams' resource potential and extent of waste utilization as a resource (Re-use/Recycle of waste) in Kogi State was investigated in this chapter. The federal and the state government are the institution responsible for response to waste management. Weak law/policies were discovered to be the main factors of deliberation in this section. Federal government poor waste management policies was discovered as one of the major factors affecting waste streams' resource potential and extent of waste utilization as a resource (Re-use/Recycle of waste) in Lokoja Kogi State. The different roles and responsibilities of each government (present and past) was also factors that are directly or indirectly affecting proper implementation of MWM in Lokoja. State government weak policy - initiatives and milestones is the main second factor. State government weak policy has contributed to poor waste management in Lokoja. Although the state government and its agencies are making efforts in managing wastes generated in the state, a considerable percentage of the generated waste is still not adequately collected, processed and adequately disposed. The most commonly adopted waste management practice involves the collection of the un-segregated waste and dumping them at marked areas or dumpsites which are limited due to competition with land use and little percentage (10%) are reuse.

Community Response 1: Mind-set of Lokoja people on community waste management was basically believe that waste management is solely the responsibility of State and Federal government, since all local and state taxes are being paid to the government. Community Response 2: Practices: One of the research findings that was discovered in this section was that the community –government practice collaboration is high, The community involvement of resident of Kogi state was examined carefully, the practice and perception of the level of community involvement in Kogi state solid waste management is high with regards to practice of preserving resources, practice of saving practice of energy; practice of securing the environment; practice of lessening practice of landfills content; and practice of desisting from indiscriminate waste disposal such as open dumping, burning or depositing in landfills which end harming the climate. Community Response 3: Knowledge on "The Potential Of Waste". The knowledge on the potentials of waste by the community is still modest. The state and the federal government needs to do a lot of sensitization and awareness on the need to know the benefits, potentials hidden in waste control and waste management Effect of community response has a lot to do with the importance of clean environment, perception of the level of involvement of community response is high so as to:

1. On energy, energy is also required the energy to move the trees and process them into paper, but when the old magazines and newspapers are recycled, so many stages would have been bypassed and thus saving energy.

2. Secure the environment: Recycling assists with securing of the valuable climate from multiple points of view. For instance, when plastic items are thrown carelessly, they could find their way to drainages and blockage and thereby causing erosion. The plastic could end up in the sea and end up hurting the ocean creatures.

RESULT

Inappropriate waste management in Lokoja has developed into the predicament existing today. The different roles and responsibilities of each government (present and past) was the main actors that are directly or indirectly affecting proper implementation of market waste management in Lokoja. Answer the first research question, namely, to explain several barriers militating against a sustainable market waste management systems in Lokoja. I) Corruption and mismanagement of fund / Funding limitation. The most important barriers militating sustainable market waste management in Lokoja include corruption. Corruption has eaten deep into the waste management system as government employees and heads of ministries constantly divert funds meant for waste management into their private pockets (Mohammed, 2021).

II) Inconsistent Policies: Another important barrier that is militating against sustainable MWM policy in Lokoja is inconsistent policies. Almost every administration abolishes and establishes its own agencies

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(Onibokum and Kumuyi, 1999). This shows how inconsistent the government views waste management. There is no continuity in the government project. New government that wins the election tend to abandon its predecessor unfinished project and starts its own new project

Improper waste management system

Improper waste management system or a situation in which a community or individual cannot dispose of waste properly also contributes to the barriers militating waste management problem in Nigeria. Lokoja capital of Kogi State alone generates 10,000 tons of waste weekly and this often leads to erosion when some of the waste is dumped by the water, mountainside, roadside or dumped inside drainage (Onibokum and Kumuyi, 1999).

Inadequate salary, lack of training and facilities. III) Another important barrier militating against sustainable MWM policy in Lokoja includes the fact that waste workers are poorly paid (Wilfred, 2022). Average Nigeria can eat and maintain his life with $100 daily and monthly $2000 to $3000 but waste bin workers are paid so low as $100 monthly or lesser making life unbearable for the market waste worker. Food in Nigeria, per month and house rent, power, medical bills, transport, electricity bill and water bill all of all is about $3000 or more so paying a waste worker an amount so low as $ 200 is not significant. IV) Low level of public enlightenment on waste management is also contributes to the factors militating against sustainable MWM policy in the Lokoja. Public enlightenment refers to the aspect of going to schools, market arenas, offices, garden and public places to inform people on the importance of proper waste disposal and the dangers of not disposing waste properly. V) Poor Governance of waste in Lokoja Kogi state encumbered the waste management system sector for many years. The state is now being poorly managed for a variety of reasons, including weak organizational structures, a lack of necessary skills, inadequate finances, weak legislation, a lack of enforcement, low public awareness, corruption, conflict, political instability, and a lack of political will. A governance failure is the root of the issue. There are no proper guidelines or operational plans to assist Local Government in implementing appropriate solid waste disposal. VI) Poor relationship between the Lokoja Community and State Government. The State Government and the community have been having some disputes for a very long time and the cause's bridge in interrelationship causing a lot of problems (Wilfred, 2022). The State Government has not been faithful in their promise done during the election period and this leads to the lack of trust between the people and the State Government. This reduces the cooperation between the government and people (Wilfred, 2022).

VII) Weak laws and regulation is also considered as one of the issues affecting market waste management in Lokoja. The government response is often more reactive than proactive. Legislation, in many cases, fragments the management of environmental issues among several public agencies, resulting in a lack of coordination for programme and policy planning and a limited level of responsiveness. The responsibility of market waste management (MWM), including its collection and disposal, falls under the jurisdiction of the Department of Environmental Health Services (DEHS) (Dias, Bernard's & Huda, 2022). (ajareoloruntoba@gmail.com and **ajare emmanuel@ahsgs.uum.edu.my**).

FINDINGS

Functional element	Detail
Segregation of storage at source	Generally absent, waste is thrown on streets
Primary collection	Does not exist. Waste is deposited on the streets and picked up through sweeping/trucks
Waste storage deposits	Very unscientific, waste is stored on open sites/ Masonry enclosures. A few containers are however is use

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Transportation	Manual loading in open trucks/ Partly dumper placers
Frequency of removal	Irregular/Alternate day/ Once in three days/ Once in a week
Processing	No processing is carried out except. No market waste segregation.
Disposal	Unauthorized dumping in open space

Barriers militating against sustainable Market Waste Mgt. policy in Lokoja.

Items analyzed include books, journals, research project reports, guidebooks, manuals, handbooks, online resources, reports by teams of expert writers or authoritative bodies, commentaries or blogs and online learning, relevant web posts by credible writers, and Lokoja official Gazette on waste management, etc, and then, market traders, residents of Lokoja and government officials.

Descriptive statistical analysis of barriers to MWM in Lokoja..

Barriers	Respondent	Yes (%)	No (%)
Waste institutions irregularity of waste collection	Market traders	5 (100)	0
	Residents of Lokoja.	4(80)	1(20)
	Government officials	3 (60)	2(40)
	Total	**12 (10%)**	
Improper waste separation facilities	Market traders	5 (100)	0
	Residents of Lokoja.	5 (100)	0
	Government officials	5(100)	0
	Total	**15 (13%)**	
Inadequate access to waste bins/bags	Market traders	5(100)	0
	Residents of Lokoja.	5(100)	0
	Government officials	3 (60)	2(40)
	Total	**13(11%)**	
Funding limitation	Market traders	5 (100)	0
	Residents of Lokoja.	5 (100)	0
	Government officials	5(100)	0
	Total	**15 (13%)**	
Low level of public enlightenment on waste management	Market traders	5(100)	
	Residents of Lokoja.	4(80)	1(20)

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	Government officials	3 (60)	2(40)
	Total	**12 (10%)**	
Waste workers are poorly paid and trained	Market traders	4(80)	1(20)
	Residents of Lokoja.	4(80)	1(20)
	Government officials	3(60)	2(40)
	Total	**11(9)**	
Large volume of unsorted waste that encroaches into reads and blocking drainages.	Market traders	5(100)	0
	Residents of Lokoja.	5(100)	0
	Government officials	3(60)	2(40)
	Total	**13(11%)**	
Inadequate waste collection vehicles/obsolete and insufficient operational equipment	Market traders	5(100)	0
	Residents of Lokoja.	5(100)	0
	Government officials	5(100%)	0
	Total	**15(13)**	

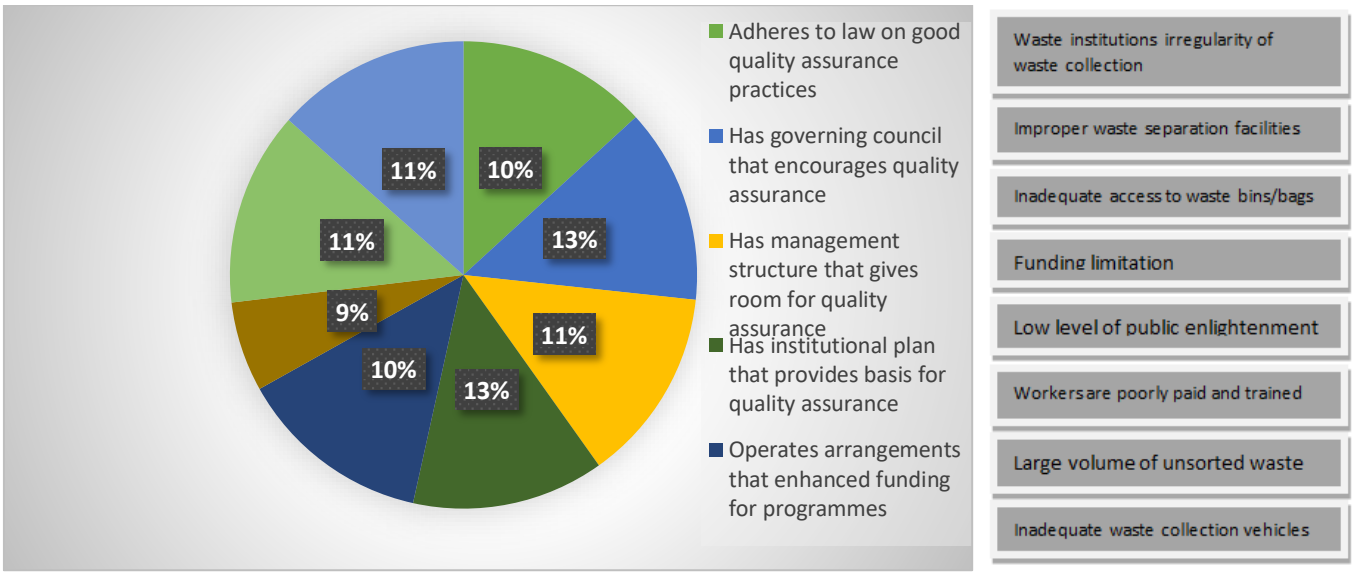

Figure 1.1

1. To investigate the waste streams' resource potential and extent of waste utilization as a resource (Re-use/Recycle of waste) in Lokoja..

   Items analyzed include books, journals, research project reports, guidebooks, manuals, handbooks, online resources, reports by teams of expert writers or authoritative bodies, commentaries or blogs and online learning, relevant web posts by credible writers, and Lokoja official Gazette on waste management, etc, and then, market traders, residents of Lokoja and government officials.

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a. The analysis of the items reviewed and 100% participants agreed that waste stream resources include paper and cardboard waste; plastic waste; food and vegetal wastes; wood waste; non-scrap metallic waste; construction and demolition related wastes; and glass waste.

b. The potential of use of the recycle wastes include:

i. Paper and cardboard: Newspaper becomes telephone directories, egg cartons, building insulation, construction paper, paperboard, paper plates, countertop, and new newspapers, while magazines become paperboard, telephone directories, and newspaper pasta and shoe boxes, paper towel rolls, and new paperboard, notebook and computer paper becomes facial tissue, paper towels, toilet paper, napkins, and new computer and notebook paper.

ii. Plastic waste: Plastics could be recycled into synthetic textile, car parts (interior, bumpers), plastic beverage bottles become carpet, backpacks, and sleeping bag

iii. Food and vegetal wastes: These are recycled as compost or manure for enriching crops in the farm.

iv. Wood waste: This comes mainly from industry, construction and demolition, as well as packaging and recycled as panels or pellets.

v. Non-scrap metallic waste: Aluminum are recycled into tractor, trailer and car bodies, new aluminium cans, and metal cans become bike parts, car parts, steel beams, rebar, appliances.

vi. Construction and demolition related wastes: This contain items such as concrete, ceramic and clay bricks, tiles, plaster board. They majorly serve in unbound sub-base layers in roads, ground improvements, and building foundations.

vii. Glass waste: Glass bottles and jars become new bottles, new jars, and fiberglass. All types of used glass containers can be reused indefinitely to make new glass products. It is actually easier to manufacture new glass containers from recycled glass than from raw material.

c. Market traders, residents of Kogi state and government officials all believed (100%) that to a large extent, waste can be utilized as a resource that produces other by-products.

DISCUSSION/CONCLUSION

Waste management will not be effective and had no positive results if corruption and embezzlement issues are not properly addressed. Poor funding is one of the most important factors militating against market waste management. The state government has not been allocating enough funds for waste management purposes because the government is more focused on insecurity, road, infrastructure and neglect funding waste control. Citizens and also the market traders did not fund waste management because they felt it is the responsibility of the government. (Nwachukwu, Isah, & Ogbaga, 2021). Waste generators (public) are not willing to pay for the services, especially when services became epileptic, expensive, and unaffordable**.**

Funding for waste management usually comes from limited sources, namely the federal, state and municipal government. This makes it impossible to offer the level of service necessary to safeguard the environment and the general public. (Onibokum and Kumuyi, 1999). As a result, the limited funding causes irregularities in the waste collection causing market waste to be picked only once a month, rather than on a weekly basis. Furthermore, there are also insufficient funds catered for fixing trucks, fuels as well as inadequate access to waste bins/bags, and insufficient operational equipment etc. Often times, the waste collection vehicles, mostly mini trucks and vans-pickup are not always in good condition and have mechanical failure, faulty or obsolete. Vehicles used for waste collection in Lokoja is not enough for a large city, at least 200 big trucks are required for effective waste weekly waste collection in Lokoja. Operational equipment which also includes hand gloves, eye protection, rain-coat, logistics etc are also not provided, the waste workers at some time pack waste using bathroom slippers and without hand gloves during raining season without rain-jacket (Onibokum and Kumuyi, 1999).

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Most politicians in Kogi State start a good project on either market waste management or some other aspects just for the purpose of winning the heart of the people but after winning the election they abandon all these projects. If they are not re-elected they will then abandon the project unfinished. The next leader who won the election will also not complete such project but start his/her own afresh. This causes a lot of unfinished projects in Lokoja. In addition, the appointment of people into waste management agencies is not based on knowledge or expertise, but on politics. This practice hampers the proper usage of highly sophisticated equipment, without adequate technical know-how for its maintenance. The continuous change in government policy and procedures has brought about a decline in such basic essential services (Onibokum and Kumuyi, 1999).

A systematic operational and institutional stable procedure is absent particularly in terms of designation of areas and facilities for the collection, intermediate storage, treatment and disposal of solid and liquid waste. There was no specific or defined waste management methodology in the state. Every household, industry, or organization handle waste their own way. Improper handling, packing and dumping of waste in the undesignated location or the act of burning or burying waste do lead to infections and spread of micro-organism that causes dangerous diseases. This waste is a result of unwanted material dumped in public or open places. Despite efforts by the State Government to control waste is still faced with the problem of improper waste disposal.

The improper waste management system may also be evident by the irregularity of waste collection which leads to large volume of unsorted waste encroaching into roads and blocking drainages. 13% of waste generation is attributed to large volume of waste not collected from the waste bin site (Ogboi and Kperegbeyi, 2009). In the big city of Jos, low waste collection coverage and irregular collection services by relevant agencies persist. There are too few collections per week, inadequate on-site storage and irregular services cripple the waste management industry (Zondi 2017). Inadequate collection of market waste is having the highest factors affecting waste management system, which requires the state and federal government collaboration to subdue the problem (Singh, Ogunseitan, & Tang, 2022).

As a result, most of the staff workers have additional private jobs aside from the waste management job. Majority of waste workers got engaged into two or three jobs in order to make ends meet. If an average low grade certificate worker is engaged in three jobs, however such a person can earn up to approximately $500 per month but will not be very effective in any of the job. The low income also makes the labour-intensive job unattractive and people are not willing to work in such places. This falls back to the state and federal government's willingness to make the waste management job lucrative for the public (Wilfred, 2022; Nwachukwu, Isah, & Ogbaga, 2021).

Apart from inadequate salary, the lack of training also contributes to the barriers in managing waste management in Lokoja. Training is a very important aspect of staff growth and performance in waste management workers. When waste management workers lack proper training, it brings about low output in job performance. The State or Federal government does not invest sufficiently in human capital as they expect the staff to be responsible for their own training. Waste collectors are perceived as being illiterate and untrained, lacking the resources to invest in their own education, and lacking government support for training. For instance when the workers lack training on health and safety measures when in charge of managing infectious trash, this has led to a heavy weight of environmental contamination that affects the overall populace. The right training and instruction is crucial for workers to be able to perform their best in a safe environment (Nwachukwu, Isah, & Ogbaga, 2021). Insufficient waste facilities and equipment also present as a major problem limiting the waste management process and procedures. Many people do not have access to waste collection services in the state, and most cities do not have access to controlled waste disposal. In addition, there is also inadequate access to waste bins/bags as well as improper waste separation facilities/ equipment. (Wilfred, 2022).

The same may also be done through the use of television, radio and by physically going from place to place with loud speaker and pamphlets. Afun (2010) stated that 80% of Nigerians are not aware of many waste management policies and sanctions. The Nigerians lack of awareness in waste management policies is also

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supported by Yalwaji John-Nwagwu and Sogbanmu, (2022) study. Citizens do not realize that the refusal to dispose of waste properly attracts relevant penalties.

This lack of awareness on waste management policies may be attributed to the failure of providing proper orientation and public enlightenment to the market people about the importance of proper waste disposal (Afun, 2010). For instance, the students from grade school were not trained on the proper and manual method of recycling waste.

In Conclusion:

This study had provided and identify the barriers militating against sustainable market waste management policy in Kogi state.

This study had investigated the waste streams' resource potential and extent of waste utilization as a resource (Re-use/Recycle of waste) in Lokoja, Kogi State.

This study had provided recommendation Lokoja, federal university Lokoja and Nigeria at large.

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AUTHORS CONTRIBUTIONS

Olusegun Amos and Ajare Emmanuel Oloruntoba, Analyzing and writing the paper. Olubunmi Temitope and Job Eunice Ohunened both contributed in the technical writing and development of this paper, Adefabi Adekunle facilitate the development of the technique utilized to producing the results.

Ethics

This is the original manuscript; there will be no expectation of any ethical problems.

WEAKNESS AND FUTURE RESEARCH

The future research of this study can be basic research, providing solution to items which the community in Lokoja Kogi State classified as waste material. Such as converting urine to uric acid, converting popo to fertilizer, converting leaves to paper, converting cans to stainless plate, converting plastics to packer, conversion use cloths to toys, converting waste food to fish food, converting waste liquid to energy etc**.**

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