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DEPARTMENT OF DEVELOPMENT STUDIES

RESEARCH TOPIC

**EXAMINING SOLID WASTE MANAGEMENT BY LOCAL AUTHORITIES
IN HIGH DENSITY SUBURBS THE CASE OF GWERU CITY COUNCIL IN
MKOBA 14.**

BY

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Dedication

To the Lord Almighty who gave me the precious gift of life and my husband Mr Wiriranai Manzungu for the support and encouragement. Also to my mother and father for being there for me and their assistance. Not forgetting my lovely daughter Nokutenda, my sisters and brothers, they are special to me.

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Abstract

Solid waste management in Zimbabwe has posed a lot of problems and challenges in many urban residential areas. The most important issue discussed in this research is the effectiveness of solid waste management in Mkoba 14 high density suburb, Gweru. Twenty five respondents from the thirty house households chosen were selected. The use interviews and structured questionnaires as data collection tools. The researcher also used purposive sampling as a sampling technique as there is no use of random selection for respondents. This study examines the challenges and problems encountered by the residents of Mkoba 14 in trying to manage their solid waste. The study looks at sources and type of waste generated in Mkoba 14 high density suburbs. The research also looks at receptacles used to store waste and methods of waste disposal used. It also looks at the measures by city in managing solid waste. It is noted in the research that GCC is encountering a lot of problems in management as there is shortage of finances for it to practice proper solid waste management and this hence had a negative effect on environmental safety and protection. Another challenge is that most of the residents of Mkoba 14 do not sort their solid waste. They have resorted to illegal dumping and burning at illegal dumpsites. They explained that this is due to inconsistent by the municipal authority in terms of refuse collection. Most of the dumpsites in Mkoba 14 were left uncovered for a long without being attended to by GCC. However the 70% of the respondents of Mkoba 14 have been negatively affected because of improper solid waste management especially those who stay near the open dumpsites.

ACRONYMES

CBD – Central Business District

EMA- Environmental Management Act

EMA- Environmental Management Authority

GCC-Gweru City Council

GHGs- Green House Gases

NGOs- Non Governmental Organizations

PHA- Public Health Act

UCA- Urban Councils Act

UNWC-United Nations World Commission

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INTRODUCTION

The researcher wants to study the effectiveness of services provided by Gweru City Council in managing solid waste in Mkoba High Density suburbs and this will promote a health and safe environment. Undertaking this study is important because it improves service delivery by the city council in terms of collection and disposal of solid waste. Inconsistence in waste collection results to illegal open dumpsites. According to Musademba et al (2011) in Zimbabwe highlighted that poorly managed dumpsites often produce bad odours and also contaminate ground and surface water and release greenhouse gases (GHGs) from rotten organic matter. So it's important for GCC to manage sold waste because this will reduce these adverse effects to both humans and the environment.

Carrying out this research is important because solid waste management has environmental benefits that can be derived from using waste reduction, waste reuse and recycling. The use of these methods reduces or prevents greenhouse gas emissions, reduce the release of pollutants, conserve resources and save energy. Management of solid waste reduces adverse impacts on the environment and improves human health and quality of life hence development is achieved.

According to Tanaka (1999) waste management nowadays is about waste reduction and recycling. It's a scenario where by those items seen as useless are processed and they find their way back to the market. These practices encouraged as it is helpful in waste management. Another key term to be defined waste, according to Goulay (1992), waste matter thrown away or something which is no longer useful and it has been discarded. Solid waste is the unwanted or useless solid materials generated from combined residential, industrial and commercial activities in a given area.

SOLID WASTE MANAGEMENT

According to Booth et al, (2001). Solid waste management refers to a range of activities in the handling of waste and should be understood to mean activities such as generation, storage, collection, transportation, processing, treatment and disposal of waste.

BACKGROUND OF THE STUDY

In developing countries including Zimbabwe, the problem of solid waste management is becoming very complicated and requires long term sustainable programmes for its solutions. According to Bandara et al (2007) solid waste management constitutes one of the most serious health and environmental problems facing government in most developing countries that include Zimbabwe. Issues of refuse collection and disposal are becoming a great challenge to the Zimbabwean citizens and the environment at large. According to UN Habitat (2006), less than 20% of urban solid waste is collected and disposed properly. Many people in Zimbabwe are not aware of the effects of solid waste to their health and also to the environment. Many people needs to be equipped with knowledge of methods of waste disposal which are not harmful to their health or the surrounding environment and this need to be done at household level. Effectively managing waste involves some of the processes like monitoring, collection, transport, processing, recycling and disposal.

According to Thomas-Hope, (1998) Government funding, donor and community play a crucial role in subsidizing the operations of cities and yet the funding is not consistence with the operations and this result in them failing to deliver the services. Most of the council's operational

plans are not practical and they are theoretical as they are imposed by the government or borrowed from others countries, hence they are not of own making.

Refuse collection in Zimbabwe is governed by Environmental Laws and Urban Councils Act., Public Health Act and Municipal by-laws. According to the Environmental Management Act (2007), all people have the right to live in a clean and health environment which is not harmful to their lives. The Environmental Management Authority (EMA) and the Ministry of Health officials always do some check-ups and enforce the hygiene and environmental laws. They regulate the collection, disposal and treatment of waste. The Environmental Management Act requires all persons whose activities generate waste, to employ measures essential to minimise the waste through treatment, reclamation and recycling. The Zimbabwe National Waste Management Strategy's main objective is to make sure that waste management does not affect human and environmental health. Environmental Management Act (EMA) Statutory Instrument (SI) of 2007 CAP 20:27, which prohibits the disposal or discharge of effluent and solid waste undesignated areas. It also prohibits discharge or disposal of any waste whether generated within or offsite, in such a manner that it causes environmental damage or ill health to any person. EMA can fine an individual, company or even the city council for illegal dumping of refuse and the amounts range from US\$1500 to US\$5000 depending on the offence committed. Plastic containers are also easily dumped and EMA is tough on anyone found carrying fuel in plastic container as this will also cause fire which destroys the environment. To make sure that city councils and residents are complying with the waste management laws, EMA carries out periodic environmental audits of projects and special emphasis is put on the management of waste.

National Environmental Management Authority (2001) of Uganda also has legislation for the protection of the environment as well as people in terms of waste management.

The Gweru City council plays a pivotal role in waste management. They collect refuse in most residential areas and also the CBD. The city council had some challenges especially with regards to finances and waste producers in high density suburbs because that's a lot of illegal dumping and open space burning is taking place. The main reason that residents from high density cannot afford bigger and durable receptacles and the city council is also failing to provide these receptacles to the residents. Due to inadequate provision of water the residents have turned most of the bins they have for storage of water. However Gweru City Council need financial assistant to be able to meet the demands of solid waste management.

CONCEPTUAL FRAMEWORK

The key issues to be looked at by the researchers include, refuse collection by the Gweru City Council in Mkoba High Density suburbs, how solid waste is being managed and this refuse collection, storage, transportation and refuse disposal. The main key issue to be looked into is solid waste management. Booth et al, (2001) Solid waste management refers to a range of activities in the handling of waste and should be understood to mean activities such as generation, storage, collection, transportation, processing, treatment and disposal of waste. This has to be done in consultation with the key stakeholders, these includes principles of public health, economics, engineering conservation and other environmental considerations. According to Ireen, (2008), waste is generally considered hazardous and therefore toxic to the biological

environment, including urban lifestyles and economic activity. Hence, it has to be properly managed and correctly disposed.

Jackson and Jackson (1998) defines waste as any movable substance or material that is perceived to be of no further use and therefore should be discarded. Waste something which is regarded as of no use as it has served its purpose or is no longer of importance. However, not all materials that are no longer used should be treated as waste and thrown away as they can be used as a result of recycling. This was supported by Miller, (1994)he says not all waste should be discarded as some can be transformed into useful products through recycling. Hence solid waste is the unwanted, useless garbage thrown away. Solid waste is that discarded immaterial which is non-liquid waste materials.

With regards to the role played by Gweru city council in managing solid waste this will focus on how effective are their services especially in Mkoba 14. The researcher wanted to see if the local authority is getting positive results in trying to manage waste in high density suburbs of Gweru. The study will focus also on challenges faced by the both the residents and local authorities due to improper solid waste management.

STATEMENT OF THE PROBLEM

This research sought to assess the effectiveness of services being provided by Gweru City council to the residents of Mkoba high density suburbs in terms of solid waste management.

The researcher wants to investigate on waste management, deeply looking on issues like generation of waste, frequency of collection, transportation, storage methods and bins used by

the residents and methods used by the residents to dispose solid waste. It is becoming a great challenge for urban councils to manage solid and dispose properly, this is because of financial challenges. Waste management is a crucial thing especially in urban areas. Due to inconsistent provision of these services people residents of Mkoba High Density Suburbs end up throwing waste on every open space and these would become illegal dumpsites. This would pose a big challenge to human health and even the environment itself.

This research is important in sense that it would improve service delivery by the Gweru City council to the residents of Mkoba High Density Suburbs. It will also impart knowledge to the residents on other method of disposing waste which are safer and will not cause any harm to the environment.

THEORETICAL FRAMEWORK

The researcher used the concept of sustainable development. According to the United Nations World Commission (1987) on environment and development, sustainable development is defined as development that satisfies the needs of the present generation without compromising the ability of the future generations. This concept focuses on use of our environment to benefit this generation but not forgetting the future generation. It also gives more emphasis on respect of the environment and reduction waste generation. According to Porter and van der Linder(1999) win win opportunities for the environment and economy can be captured through improvements which reduce pollution in production processes. Also as Porter hypothesis states, properly designed environmental policies that make use of market incentives can encourage the introduction of new technologies and reduce the production of waste. Therefore proper waste

management has a link to environmental protection, since also the concept of sustainable development gives emphasis on proper use natural resources and environmental protection. Protection of the environment also helps to protect the habitats of the species that are essential to environmental wellness. But because of poor waste management residents in urban areas end up having illegal dumpsites and throwing solid waste everywhere. Some end up burning such waste which is not good to the environment and even human health. This is not good to environmental wellness because it destroys plants and animal species which are crucial.

OBJECTIVE

- To determine level of competence within the refuse disposal system in Mkoba High Density suburbs
- Analyze the role played by local authorities in Zimbabwe in dealing with waste management
- To make recommendations on how waste management can be managed to improve sustainability health safe environment

RESEARCH QUESTIONS

- What are the levels of competencies within the refuse disposal system in Mkoba High Density Suburbs?
- How effective is the role played by local authorities in Zimbabwe in trying to manage solid waste?
- What are the waste management recommendations that can be used to manage and improve the sustainability of a safe and healthy environment?

SIGNIFICANCE OF THE STUDY

The researcher has been motivated by challenges being faced by the residents of Mkoba high density suburbs as they try to manage waste on their own. Moreover the researcher is much concerned about the environmental impacts as result of waste being dumped and burnt everywhere. This is, because according to Makwara (2011) waste management should be undertaken in such a manner that garbage handlers, the public and the environment are not endangered in any way. In support of this, Jackson and Jackson(1998) alludes that, waste disposal sites should be located reasonably far away from human habitation to prevent the migration of vermin and odours to people's homes. Booth et al(2001) contend that the disposed waste should ideally be covered with soil or be sprayed so that disease vectors will not breed and spread diseases. The concern of waste being dumped everywhere and on most open spaces nearby houses would pose a risk to human health. This would therefore affect development. This is why the researcher was motivated to carry out the research.

LIMITATIONS OF THE STUDY

The researcher had some challenges in carrying out this research. Some of the challenges include the financial challenge, the researcher had to travel from Zvishavane to Gweru Mkoba high density suburb to gather information from the residents. Funds were limited but however the researcher was successful. Moreover, some of the respondents see would financial gains in carrying the research. The issue of time frame was another challenge because there was no enough time to carry out this research. However despite all these challenges the researcher managed to successfully do the research.

RESEARCH METHODOLOGY

This chapter focuses on research methodology and the method used by the researcher is qualitative research methodology. This is so because the research is qualitative nature.

QUALITATIVE RESEARCH

According to De Vas et al (2002:79), the qualitative research paradigm, in its broadest sense, refers to research that elicits participants accounts meaning, experience or perceptions. It mainly focuses on data that is descriptive spoken in participant's own words or written words. This research methodology is also concerned with non-statistical information. The main idea behind the use of qualitative methodology was acquire information on experience of the residents with the municipal council in terms of refuse collection and disposal. Also their descriptive information on the challenges and methods they used to dispose' their solid waste. The health hazards they incur because of inconsistent collection of refuse and the methods they use to dispose especially the illegal dumpsites. The researcher noted that qualitative method was the appropriate method to gather such information.

DATA GATHERING INSTRUMENTS

Key informant interviews

These are interviews that involve dealing with respondents that are crucial to your study. The key informant interviewees produce first-hand knowledge and qualitative descriptive information.

Questionnaires

These are a set of questions given to respondents so that they will come up with answers. According to Polit and Hungler (1997:446), defines a questionnaire as "a method of gathering

information from respondents about attitudes, knowledge, beliefs and feelings”. Use of questionnaires is important because it gives the respondents sense of anonymity and confidentiality. The respondents would answer the questions freely without the interference of the one carrying out the research. Another advantage of using questionnaires is that respondents would respond to the questions at their own convenient time, hence avoiding inconveniences.

SAMPLING

This is one of the methods of data collection. To collect data on a smaller scale, researchers gather data from a portion or sample of the population. According to Frey et al (2000: 125) a sample is a “subgroup of a population”. So sampling is taking a small group from a bigger group either randomly or non-randomly. Sampling makes the research easier because it saves time and money.

SAMPLING METHOD

Purposive sampling

According to Babbie (1990) purposive sampling is selecting a sample “on the basis of your own knowledge of the population, its elements, and the nature of your research aims”. Thus the use of non-random selected and based on certain characteristics. According to Babbie (1990), this sampling method is also known as judgment or judgmental. The researcher used purposive sampling because there would be no use of random selection of respondents.

LITERATURE REVIEW

According to (United Nations environment Programme [UNEP]-International Environment Technology Centre [IETC], (2003) our current lifestyles and activities are producing vast quantities of waste. The affluence of western societies has given rise to unprecedented quantities of waste, presenting one of the most intractable global environmental problems. All production processes invariably produce waste yet its management, especially in third world countries, leaves a lot to be desired. Whereas waste generation is on the rise, levels of collection are deteriorating. However, growing environmental awareness, restricted finances and a declining abundance of natural resources are demanding a change in waste management practices.

The United States is facing a huge solid-waste disposal problem, especially in urban areas. US citizens produce more than 4 lbs (~2 kg) of waste per person per day, more waste than can be disposed of in an environmentally sound but economic and local manner. Currently totals represent an increase of more than 60% over 1960 per capital waste generation. Most landfills are within 5 to 10 years of closing unless current facilities are expanded or new landfills opened. Urban areas lack space for new landfills due to the associated urban sprawl of affluent suburbs that uphold a NIMBY, “Not-In-My-Back-Yard”, mentality. Costs to dispose of municipal solid waste have skyrocketed in recent years as well. The evidence indicates that US currently face a national waste crisis, and perhaps their basic premise for solid waste management must change if we are to survive the next decade or two.

According to US Environmental Protection Agency, (2012) many States have Pay-as-You-Throw (PAYT) programs, with Minnesota, California, Washington, Wisconsin, Iowa, and New York having most of these programs. For example, under the PAYT programs, people are asked to pay a flat fee for bins or trash bags and they are encouraged to generate less waste and thereby

save money on the bins or trash bags. Some of these are also called Volume-Based-Waste-Fee (VBWF) programs. Some of the methods are recycling, composting, thermal treatment with energy recovery, and landfilling. However, the generation of wastes can be reduced by various means, such as better design of products and packaging, and therefore “Reduction” is placed at the very top of the waste management hierarchy. There also use of other methods for example composting which one of the ways of waste management. Clark, (2013) Composting or biological decomposing of organic wastes, in US is still not so prevalent, but California, Washington, and Minnesota are leading the way with the most curbside collection programs for compostables. These methods proved to yield better results though they need great improvement.

Solid waste management has become as one of the greatest challenges that has arisen in almost all urban local authorities in Zimbabwe. Rapid urban population growth during the last decade, coupled with hyperinflation, economic decline and a fall in both capital and recurrent real budgets of local authorities, among other factors, placed considerable strain on local authority resources, resulting in the failure to provide adequate services to their residents and areas under their jurisdiction. Practical Action, (2007) Zimbabwe produces an average 2.5 million tonnes of solid waste (household and industrial combined) per annum. Due to the rise of solid waste production versus financial challenges faced by municipal councils, it is becoming problematic for municipalities to meet the demands of solid waste management. Practical Action (2007) alludes that, Waste collection by local authorities was reported in 2007 to have dropped from 80% of total waste across different local authorities in the mid-1990s to as low as 30% of total waste in some large cities and small towns in 2006. The most affected areas include low-income

residential areas and informal settlements, and some would not receive waste collection services at all.

Due to these challenges being faced by municipal authorities, litter has become a common sight along high ways and in many urban and peri-urban communities in Zimbabwe. In spite of the numerous clean-up and anti-litter campaigns that have been initiated by different individuals and organizations coupled with the tremendous effort that has been put in making the public aware of the disadvantages associated with littering, endemic and insistent filth engulfs Zimbabwe as people continue to litter. Zimbabwe's waste management has virtually collapsed, triggering chaotic and rampant waste dumping, putting the health of residents at great risk. The prevalence of various forms of litter in these communities has been fuelled by a consumerist corporate and social culture where a lot of packaged foodstuffs are manufactured to be consumed on the run. Inefficient collection mechanisms by municipalities and lack of 'separate at source' models have led to adverse effects on our ecosystem and the environment. Litter has primary and secondary effects on the environment and the community. The corporate world is affected by disease outbreaks as employees are either directly or indirectly affected. Considering that most industries are located within the vicinity of high density areas, their industrial waste management systems are also a cause for concern. Considering all the above mentioned factors, the researcher examines ways and means of effectively managing waste in Zimbabwe's urban areas to reduce the exposure of people and the environment to waste hazards. There should be built some environmental awareness and changing the mind-set of ordinary Zimbabweans and litter should be everyone's concern. Waste disposal should be done in accordance with the best principles of public health, economics, engineering conservation, aesthetics and other appropriate

environmental practices. The major conclusion is that there is urgent need for sustainable waste management chiefly through community participation.

ETHICAL CONSIDERATIONS

According to Leedy and Omrod(2010) if humans or creatures with feels that they are focus of investigation researchers must seriously consider the ethical considerations and also ethical implications of what is about to be done. In researching the researcher take into consideration protection from harm, informed consent and right of privacy.

The participants were also well informed of the topic and also the purpose of carrying out this study or research. This made the participants to participate freely.

The researcher takes into cognisance voluntarism and getting the adequate information from the participants. Voluntarism encourages the participants to express themselves freely and provide relevant information.

CHAPTER ONE

LOCAL AUTHORITIES AND SOLID WASTE MANAGEMENT IN ZIMBABWE

1.0 INTRODUCTION

There are roughly twenty five (25) urban local councils in the country which exist in some continuum ranging in size and complexity from growth points to towns and cities. Zimbabwe, like other developing countries, the rate at which waste is being generated is still relatively low. The greatest challenge becomes the management of that solid waste as most of the local authorities having challenges in terms of finance and equipment. Waste management has become the greatest challenges being faced by urban local authorities. The rate of urbanization is also growing and also waste generation is increasing especially in the high density suburbs.

Chidavaenzi(2006) observes that urban growth in Zimbabwe continues at a much faster rate than the provision and expansion of infrastructure and services.

Zerbock (2003) defines solid waste management as a framework within which all activities regarding waste take place. The importance of proper solid waste management helps in giving knowledge and insights on how to reduce waste to promote ecological sustainability. Proper waste management encourages sustainable development and promote safe disposal and treatment which encourages a health and safe environment. According to Ogwueleka, (2009) municipal solid waste management has emerged as one of the greatest challenges facing environmental protection agencies in developing countries, in his study to examine the current solid waste management practices and problems in Lagos in Nigeria, reported that solid waste management in Lagos is characterized by inefficient collection methods, insufficient coverage of the collection system and improper disposal. Hence there is greater need to encourage the departments which includes the institutional, political, social, financial, economic and technical aspects of municipal solid waste management to come up better results on sustainable, effective solid waste management.

The challenge of solid waste management is the topical issues in urban in developing countries like in Zimbabwe. Environmental and health impacts caused by improper solid waste management system caused a great challenge to urban residents. Tevera, et al (2002) and Majani (2002) investigated solid waste management in Zimbabwe and Tanzania and concurred that due to financial constraints, many cities and towns in these countries are not adequately meeting their refuse collection obligations. Especially in Zimbabwe residents have resorted to illegal dumping

of solid waste in open spaces and drains. Musademba, et al (2011) noted that waste management in Chinhoyi town is constrained by a lack of financial and material resources resulting in the municipal authority failing to properly assist residents in waste storage, failure to collect and transport the waste, resulting in residents and business resorting to illegal dumping, burning and burying the waste at generation site. This research is undertaken because of improper handling solid waste in Zimbabwean cities and this include proper waste collection and disposal. This research, focus on solid waste management which involves, separation and storage until wastes were placed in storage containers for collection to the point of disposal. The researcher is going to look on the disposal methods and systems and their impact to the environment and human health. Ways in which solid waste is being managed is evidence that authorities are failing to carry out proper sustainable solid waste management which would help to curb environmental and human health problems such as the outbreak of diseases like cholera and typhoid.

According to Matowu and Tevera, (2002) in Zimbabwe's cities and towns, solid waste management has reached crisis levels as there is now mismatch between planning and policy implementations and this is worsened by some financial problems experienced. Musademba, et al (2011) like Tevera, et al (2002) and Majani (2002) seem to have concentrated their investigation on certain aspects of solid waste management at the expense of others such as waste generation and disposal. Achankeng (2003) states that solid waste management involves generation, storage, transportation and disposal of waste. Proper solid waste management requires that all the five aspects are included and done in a proper manner. Proper solid waste management should be looking at solid waste generation, handling, separation, storage, transportation and disposal. There is also need for the council to adhere to the stipulated

conditions necessary when choosing the site of a dumpsite. However, it is important to note that there is need to consider recycling and waste reduction before disposal. This is important because it will reduce improper waste disposal by the residents.

1.1 LOCAL AUTHORITIES AND SOLID WASTE MANAGEMENT PRACTICES

Municipal Solid Waste comprises of all waste that generated at homes, street and industries. This waste collected mostly by the local authorities and disposed. Proper management comprises of waste separation , reduction , recycling, reuse, collection and disposal of waste that is useless and cannot be recycled in engineered landfills. The most important components of waste management are source waste reduction and reuse and its followed by recycling or composting, energy recovery and finally treatment and disposal of solid waste in engineered landfills.

According to Teveraet *al.*, (2003), solid waste management involves the seven stages which are refuse generation, storage, transfer, collection, transportation, processing and disposal. However the Author left outside the other important factors of solid waste management which are recycling, reuse and composting of waste in his definition. These stages differ with countries depending on policies levels of development interms of finances and participation of stake holders and institutions.

1.1.1 Waste generation

Cointreau,(1982), low income people are said to generate more waste than medium and high income people. Waste generation in high density suburbs is much greater because a greater

proportion of urban residents reside in high density suburbs. High levels of waste generation are as a result population growth and urbanization in many cities. Henry, et al (2006) discovered that waste generation and disposal in Kenya has been rapid, while the capacity to collect and safely dispose of the material has been on a general decline. Rapid population growth and urbanization in many cities, is seen as the major cause of deterioration of the services being provided by municipalities. Residents blame the municipality's inability to keep all municipal solid wastes collection trucks at full operational capacity and they say the inappropriate disposal of municipal solid waste in paths, riversides, and road reserves is as a result of the failure of municipal authorities to provide adequate services.

1.1.2 Sources and type of waste generated in Zimbabwe

It is expected that an urban area which has many industries is likely to produce more metallic waste. For example, the composition of waste in Bulawayo the second largest city in Zimbabwe was 50% plastics, 40% food waste and biomass, 10% paper, 5% metallic waste (Mudzengerere, 2012). The composition of waste in Chinhoyi, one of the municipalities in Zimbabwe was 45% food and biomass waste, 23% plastics, 12.5% metallic waste and 7% paper waste (Musadembat *al*, 2011). The low metal waste composition in Bulawayo was due to the fact that industries were non functional over a decade of economic decline. This could be a result of little waste coming from industries as most industries were not operating and for the two urban councils there were equal consumption patterns of food stuffs.

1.1.3 Solid Waste Handling and Separation.

Solid waste handling involves how waste is handled upon production which includes separation and storage. Solid waste handling, separations and storage are concerned with management of waste until they are placed in storage containers for collection to the point of disposal. Waste handling, separation and processing happen at three levels that are at household, municipal transportation level and at the dumpsite. Medina (2010) indicates that waste handling is done to get rid of access to vectors, dogs and cats as well as the facilitation of safe, efficient, processing and disposal facilities and to encourage the separation and recycling of waste at the source.

In Zimbabwe's high income households waste handling is practiced in a better way which is environmental friendly. Waste is handled in different ways which include separation and wrapping of the waste before its disposal and placing it in a receptacle. This is so high income household because they afford to buy those bins and they also afford as compared to those from low income areas. In Zimbabwe residents usually do not separate their waste before placing them in receptacles. They put their waste mixed in bins. Separation of waste upon production is important because it makes disposal to be easy. More so waste must be wrapped separately upon production before being placed in receptacles. Some residents use plastic papers to wrap their waste before placing in a bin. Separation of waste is important because it prevents rodents, it makes disposal easy and lessens the job of waste pickers. It is also important on recycling and reuse of other waste that can be useful.

1.1.4 Types of receptacles used by Zimbabwean residents

In Zimbabwe especially in high density suburbs, households store their waste in sacks, baskets, plastic bags and a few people in bins. Some of the groups of people from the low density

suburbs which are high income areas use formal bins such as twenty litre (20l) plastic bins. Musademba et al (2011), observed that low income residents in some of the suburbs in Chinhoyi town use informal receptacles such as cardboard boxes. Musademba, et al (2011) noted that individual households provide their own bins, as a result of lack of financial resources to purchase the most suitable and recommended receptacles, communities end up resorting to not environmentally friendly receptacles such as the use of plastic bags as well as cupboard boxes which have low carrying capacity and are not durable as well. Situations like that, poses a high risk to environmental health which is related to solid waste management.

The rate of waste generation and period that is taken for the waste to be collected for disposal do not suit the use of receptacles like plastic papers, cardboard boxes, mealie meal sacks and other small and improper receptacles used by residents. Most of the receptacles which are used by Zimbabwean residents make it difficult for proper solid waste management to be achieved in Zimbabwe.

1.1.5 Storage of Waste and Coverage of Receptacles in Zimbabwe

A receptacle can be defined as any container either metal or plastic tin, paper that is used to store waste for temporary bases. A proper receptacle should be used for a long time and should be strong which shows its durability, closed and not easily damaged by dogs and rodents. According to the Government of Zimbabwe, (2002) both Zimbabwe urban councils and owners of the properties are responsible for ensuring that receptacles are available for each property. For instance, Bulawayo residents receive metal bins from the Bulawayo City Council. Most residents have now resorted to the use of plastic bags and some cardboard boxes temporarily because of the high costs of bins. According to Muzengerere (2012) noted that 48% of the

residents store waste in plastic bags as receptacles in Bulawayo. He also notes that those who have proper receptacles which are metal bins are estimated to be 44%. The author also is of the idea that proper receptacles should be charged a fee that is affordable by the residents. Mangizo (2007) also noted same challenges in Gweru, Zimbabwe and he recommended that local authorities should make sure residents are given proper receptacles so that sustainable waste management could be achieved .

Financial constraints and economic hardships in Zimbabwe have affected the coverage of receptacles. Chinhoyi is also amongst the towns which have challenges of affording proper receptacle. Musadema *et al.*, (2011) in Chinhoyi 22% use metal and plastic bins they receive from council, 26% resort to sacks, 19% to plastic bags, 25% use pits at the back yard, and 8% use boxes and plastic buckets. The lack of enough receptacles in Chinhoyi, Gweru and Bulawayo provide proves that there are no recycling strategies in most parts of Zimbabwe as recycling needs more than one receptacle for sorting and separation and sorting of waste. Inadequate receptacles proves that residents would illegal and open space dumping.

1.1.5 Collection and Transportation of Solid Waste

Collection mainly focuses on loading and transportation of the refuse from the households to the point of disposal. Masocha (2003) discovers that collection involves two stage and these are direct and indirect collection. Direct collection when waste collected using only one means transportation that is waste loaded in a truck from the storage point and is taken straight to the disposal site. Then indirect collection, refuse is collected from the storage facility and it's taken to transfer station, and from there, solid waste is loaded into the secondary stage, and the waste is taken to the disposal site.

Equipment, fuel and labour costs are important factors to be considered pertaining to collection and transportation to the point of disposal. In Zimbabwe waste collection and disposal should be prioritized because proper waste management creates a health environment. Proper waste collection and disposal is crucial as it prevents environmental pollution and also diseases like diarrhoea and cholera. If the local authorities fail to collect solid waste, residents resort to illegal dumping in open space or in drain. Solid waste collection services were restricted to the residents of high income earners as they are prepared to hire private collectors to do the work if there is a delay in the collection of waste. Moreso, local authorities concentrate on their limited service in the central business. However, during their field visits it was noted that illegal dumping was a common sight at the back of most buildings in the central business. Residents resort to burning as a means of waste disposal

Challenges of solid waste collection and transportation and environmental fate of uncollected solid waste are closely linked to rapid waste generation. The growth in municipal solid waste generation has been rapid while the capacity to collect, transport and safely dispose of the material has been on a general decline. In support of the research findings, Manyanhai and Sango (2006) state that rapid population in urban areas has over stretched the capacity of most local authorities to adequately provide service such as to collect and transport waste to disposal sites. The inability to keep municipal solid waste trucks at full operational capacity was cited as one of the problems derailing the fast collection of waste.

Collection of combined and separated solid waste in urban areas is difficult and complex because the generation of wastes takes place in every apartment building and commercial and individual facility as well as in the streets, parks and even vacant areas (UNEP 2009). So in any waste collection operation, it is important to look into types of equipment to be used and associated labour requirements and collection routes.

1.1.6 Disposal of Solid Waste

Disposal is the last stage of solid waste management. The disposal of solid waste is the final stage whereby those materials regarded as of no use are finally disposed. Some of the major objectives of solid waste management are to dispose the discarded material in a manner that is socio- economically and environmentally acceptable and to remove waste time to time from inhabited places to prevent the spread of diseases, to minimise the likelihood of fires and to reduce aesthetic insults arising from putrefying organic matter.

Thompson (2004) notes that, waste disposal is one of the most pressing and most visible environmental issues in African cities; hence very little progress has been made in upgrading waste disposal operations. Most common methods which are used in solid waste disposal include open dumps, composting, landfills, sanitary landfills, and secondary landfill and finally incineration. Studies show that sanitary landfills are common in the developed countries whilst unplanned dumpsites are a characteristic of developing countries.

The study by Mangizvo (2008) was meant to examine the management practices at Mucheke dumpsite. He argued that haphazard throw away and dumping of solid waste at Mucheke

dumpsite has reduced the aesthetic value and scenic beauty of the environment. The study revealed that the council did not adhere to the stipulated location criteria of dumpsites, so this risked the health of residents of Runyararo West. In addition, it was noted that the road to this site was poorly maintained, hence presents significant risk to waste transport. Composting is the process of turning organic household waste into fertilizer through aerobic fermentation. This fertilizer can be used in lawn, parks, and garden and in other agricultural activities.

1.2 RESIDENTS OF HIGH DENSITY SUBURBS' BEHAVIOUR IN WASTE MANAGEMENT

Human behaviour is the greatest challenge to be dealt with especially when it comes to issues to deal with waste management in Zimbabwe. This is critical as residents of high density suburbs had tendency of dumping garbage on every open space which becomes their behaviour. Kalantari et al (2007) notes that only change in human behaviour can reduce environmental problems such as urban garbage. Kalantari and Asadi (2010) posit that attitude and behaviour are multidimensional and their models on environmental behaviour include environmental attitude, environmental information, feelings of stress, preparedness to act and environmental legislation. To be able to manage human behaviours and attitudes in waste management, there is need to assess the levels of capabilities in terms of resources and facilities. Rodrigues (2007) simplifies this to "ability, desire and opportunity" which is a rather apt way of putting it. For instance, one may have the desire and ability to recycle glass but if there is no glass recycling facility available they may end up not doing so. So it is important to look on human behaviour and attitudes and also extend to look into the capabilities, resources and knowledge which people possess. This assessment would help Zimbabwe as a nation to come up with the solution to waste management

when it comes to residents of high density suburbs. Environmental stress due to pollution is going to be reduced as the assessment would reduce pollution.

1.3 EFFECTS OF POOR SOLID WASTE MANAGEMENT ON QUALITY OF LIFE.

Some of the effects of solid waste management on the quality of life are environmental, health, social effects

1.3.1 Environmental Effects

The environment is at great risk because of solid waste not properly managed. The improper management of solid waste causes pollution which affects the environment and such things include atmospheric contamination, water and land. The pollution is caused by solid waste not properly handled. Inappropriately managed waste could result to water pollution. Solid waste thrown near water ways also had a great negative impact because unregulated leachates from refuse also makes it difficult for the provision of clean water and it also results in floods. This is so because indiscriminate dumping and refuse overflow results in blocking of drains. Because of these blockages water cannot drain from the streets and this result in formation of stagnant waters which are favoured breeding places of anopheles mosquitoes. Due to the high rate of breeding of mosquitoes people who stay nearby would be affected by malaria. Street runoffs become great challenge to human health especially when the drains are blocked with waste or refuse. Thompson (2004) alludes that these poor conditions can cause cholera, so residents who live closer to refuse dumps are subject to more bouts of cholera.

Federation of Red Cross and Red Crescent Magazine (2010) highlighted that the cholera outbreak of 2008-2009, which claimed over 3500 lives in Zimbabwe was a direct consequences of a breakdown of municipality services including irregular refuse collection. Throwing of solid waste on every open space and poorly disposed solid had a greater impact on the environment which would also result in affecting human health and environmental wellness.

1.3.2 Health Effects

Due to the challenges being faced by municipal authorities in some high density suburbs they can go for even a month before solid waste is collected and had attracted some swarms of flies. The presence of flies in the household lures the threshold for contamination food and cooking items. These houseflies can act as vectors for various diseases for transmitting pathogens through direct contact or through their droppings. This hence poses a high risk to diseases like diarrhoea and even cholera as a result of food contamination because of swarms flies. This is supported by Conyers; et al (2002) learnt that the high incidence of diarrhoea in Tanzania in 2001 amongst children is related in part to food contamination by flies. Information gathered from the Ministry of Health reveal that hygiene related diarrhoea alone is thought to cause deaths in Arusha in Tanzania. The flies can also carry germs on their bodies from the illegal dumpsites to homes which also poses the risk of the spread of diseases like cholera and diarrhoea.

Thompson (2004) notes that the effects are numerous on man, the flora or fauna of the environment in form of health problems from convulsion, dermatitis, irritation of nose or throat chest pains, stomach pain, vomiting, diarrhoea, and lung cancer to death. Also the formation of stagnant waters because of blocked drains which are breeding places for mosquitoes and this

result to the spread of diseases like malaria. Uncontrolled dumping sites are posing a great risk to health of residents who resides near dump sites. Illegal dumping on open spaces threatens the health of people especially those who scavenge waste because of sharp objects and other things like bacteria.

1.3.3 Social Effects

Dumping solid waste on every open especially on dumpsites which are near residents houses causes clashes and also strain the relationships of residents. The residents from other locations would go and dump their waste to the dumpsites in other locations. This also forced the lodgers who reside in those places with dumpsites to move to other locations as these places becomes un desirable. Thompson (2004) noted that a city with a hazardous waste facility is perceived as an undesirable place to live due to its negative consequences. So dumping waste on uncontrolled dumpsites affect the social relations of the residents.

1.3.5 Ground Water Pollution

Researchers have shown that disposal of waste results in water contamination. This affects both ground and surface water resources. According to Oelofse (2008), Leachate from dump sites and unlined landfills is the main potential source of pollution from solid waste disposal that needs to be managed. There is need to seriously protect ground water in Zimbabwe as it is the source. There is greater need for serious control open space dumping and disposal as they are potential contaminants of water resources. Studies have shown soil contamination is as a result of contact with waste for example according to Chifamba (2007) a study of the dumpsite in Kariba in Zimbabwe, metal concentrations were determined in soil samples collected from the area

during 1996 and 1997. Accumulation of copper (Cu), lead (Pb), iron (Fe), and zinc (Zn) were found within the disposal site. The concentration of Zn, Pb, and Cu were found in surface soil samples up to 75 meters away from the disposal site. The author also showed that water samples taken from the vicinity of the dumpsite had a high concentration of mercury (Hg) and lead (Pb).

1.4 LEGISLATION GOVERNING SOLID WASTE

In effective solid waste management is a great challenge to both the environment and humans. This is not only affecting one country but most developing countries are being affected. This is so because there is no clarity on objective, there also lack of smooth flow of information and a strong analytical base in policy formulation. Environmental protection and proper solid waste management needs policies and rules that are strongly followed and effectively implemented practically on the ground and not only in theory. If the policies of these legislations are followed practically and are effectively monitored by the ones who put them in place there would be a great improvement on solid waste management in Zimbabwe.

1.4.1 Environmental Management Act (EMA) of 2002 in Zimbabwe

Section 69 of the Environmental Management Act (2002) discourages the pollution of the environment or the disposal of waste by any person or group that will pose any effect on the health of people. Moreover this law on Section 36 also states that every user would take necessary measures to reduce waste through waste minimization, reuse and deposit inert waste in engineered landfills. However the weakness of section 36 is that there is no specification of recyclable waste. In Zimbabwe, there is lack of strong emphasis in waste minimization though they mention about recycle and reuse. There is need to dwell much on public campaigns which

encourages waste minimization, waste separation strategies and should include the residents who are the users. This makes the users to take responsibility as they enjoy the programme.

Section 180 of EMA (2002) Chapter 20:27 assign the Agency to set regulations and standards regarding the activities which have influence on the environment. Thus the Environmental Management (Effluent and Solid Waste Disposal) Statutory Instrument Number 6 of the year 2007 enforces every generator of waste except households to develop a waste management plan by the end of each year and it is an offense for the waste generator to fail to produce the plan. Likewise, Statutory Instrument 10 of 2007 enforces that each year the generator of hazardous waste should also develop a waste management plan which should include an inventory of hazardous (quantity and composition), goals for reducing waste and its adverse effects on the environment. The act is vital in the sense that it has come with the plan for sound solid waste management. However, the regulation did not did not give much emphasis on the involvement of stakeholders in the formulation of the waste management plan.

Section 14 of Statutory Instrument 6 binds local authorities to choose suitable for waste disposal. It also states that waste shall be collected frequency as this would prevent decomposition of waste before collection. Government of Zimbabwe (2007) , alludes that the regulation encourages the local authority or residents to make sure that they have adequate receptacles enough to contain waste or refuse until the collection time elapsed.

1.4.2 Public Health Act of 1996.

Government of Zimbabwe, (1996) alludes that, Section 83 of the Public Health Act of Zimbabwe (1996) states that it shall be the duty of every local authority to take all lawful, necessary, and

reasonably practical measures for maintaining its district, in a clean and sanitary condition by preventing the accumulation of waste, which may be injurious or dangerous to health .This is supported by the EMA Act of 2002 but however, the EMA Act did not specify of provide detail of how the council, waste generators and residents must do to achieve a healthy environment. There must be strictness in terms of provision of receptacles, refuse collection and disposition of waste in engineered landfills on the part of local authorities to achieve a healthy environment. They are encouraged to work together with the waste generators to encourage them to minimize waste.

1.4.3 Bye Laws for Urban Councils

In Zimbabwe urban councils which governs solid waste. For instance Gweru City Council (1982) bye laws govern collection and disposal of wastes in the city. It states that it is the responsibility of the owner to maintain the premise free from solid wastes, such as debris, disused motor vehicles, filth, glass, paper, rags, rubbish, rubble, and anything regarded as a nuisance. The challenge is that urban councils lack viable management regulations which are in place to support waste reduction and recycling. These management regulations should not leave waste management stakeholders.

1.5 STAFFING OR HUMAN RESOURCES

It is crucial to have balance between staffing level and households that are supposed to get services. This will promote quality provision of services to the households. But here in Zimbabwe due to economic challenges and financial constrains it could have affected the human resource department that works solid waste management. Henderson (2005) also suggested that the level of qualified personnel plays an important role in the success of the solid waste

management system. The same author suggested that the international staff break down is 10% for top management, 25% for middle management and 75% for labourers.

1.6 CHALLENGES FACED BY ZIMBABWEAN LOCAL AUTHORITIES IN SOLID WASTE MANAGEMENT

Zimbabwe still lacks appropriate and effective technologies in waste management. In addition, the country's deteriorating infrastructure has resulted in poor waste management which has seen an accumulation of waste and outbreaks of diseases (Machivenyika, 2012). Chingwenya (2010) noted that challenges and the ineffectiveness of the city council to provide services to the people faced by Kwekwe Municipality is attributed to lack of decentralization and devolution as well as the heavy presence of the government's hand in all sectors as it continued to interfere with their day-to-day running of municipality affairs. Gukurume (2011) discovered that poor service delivery was also due to the dominance of government parastatals and municipal council as the sole service providers.

1.7 CHAPTER SUMMARY

The chapters mainly focus on how solid waste is being managed in Zimbabwe. Solid waste management in urban areas have been carried out, there is however, a lot to be done in the sorting and grading of solid waste and their transportation to legalized dumpsites. Most of the studies did not look at solid waste management challenges in urban areas wholesomely, that is, they did not study the five stages generation, storage, transportation, collection and finally disposal. The challenges cited in the studies on the management of solid waste in towns and cities of developing countries and then Zimbabwe's cities and towns in particular, prompted the

need to study solid waste management in urban areas. Also the challenges faced by city world is dynamic, faced with technological changes daily and operating as a global village, some challenges are always generated, so this means much should be researched on the challenges faced in trying to manage solid waste.

CHAPTER TWO

GWERU CITY COUNCIL AND SOLID WASTE MANAGEMENT IN MKOBA 14

2.1 THE GWERU CITY CONTEXT

Gweru City Council mainly focuses on administration issues of the city organization. The city is managed with political and administrative consistency with cautious and targeted expenditure. This shows that it is able to make effective decisions which are influential to solve problems that concern solid waste management in high density suburbs. Due to urbanization and high population growth in high density suburbs it is affecting the provision of services by the city council of Gweru to the residents especially of high density areas. It has also resulted in the depreciation of infrastructure, the clean water supply and even refuse collection and disposal and this has seriously resulted to poor sanitation in the city. Sanitation, refuse removal and health services are the duties of the Health Department. This department had a need to make sound decisions to be able to deal with the problem of solid waste management. A research study by Plummer and Nhemachena has revealed that Gweru City Council managers, by then, did not consider customer management in terms payment waste disposal tariffs as one of their strengths. This shows that the Gweru City Council is not able to handle the residents as their clients with a firm so that they pay the tariffs.

The city council goes to the extent of failing to pay their workers this is affecting their services to the residents. Respondents from households said that the tariffs are too high and they are not able to pay the bills. So this might be another reason they are being resistant to tariff payment. This is because even those who had a good history of paying regularly they are now not paying. So improper solid waste management is closely linked to inadequate funds to meet the needs. This

means that there is need for consultation of residents for influential decisions to manage to curb the challenge of solid waste management.

2.2 SOURCES AND TYPE OF GENERATED IN MKOBA 14 HIGH DENSITY SUBURBS

The sources of waste generation include households and market places like Mkoba 14 shopping. Domestic refuse generated in Mkoba 14 include food waste, waste from weeding, garden waste, hedge cutting, plastics, rubber, old clothes, papers and other household waste includes batteries, used lights, disused furniture and books. The major components of waste generated in Mkoba 14 include food and vegetables. Also plastic papers, metals and rags of clothes are also other types of waste produced. The biodegradable waste dominates at market centres like Mkoba 14 shopping centre. Even in households some of the waste also contains food items which are biodegradable.

2.3 STORAGE EQUIPMENT USED IN MKOBA 14

Local authorities encourage residents to use proper receptacles include plastic, metal bins and plastic bags they are given by urban councils because they are strong and can store waste for a longer time. They discourage the use of storage receptacles like cardboard boxes, paper bags, plastic bags made of very thin plastic as they quickly be filled and get torn.

After waste has been generated it is temporally stored at homes in Mkoba 14 before it is collected or dumped. In Mkoba 14 high density suburb residents use storage facilities which includes plastic beans, metal beans, plastic paper beans and even some use sacks. In Mkoba 14

high density suburb half of the respondents testify that they use plastic bags as storage equipment and the other half uses metal and plastic beans. These facilities are not adequate enough as waste is generated each and every day.

However the greatest challenge in Mkoba 14 high density suburb is that sometimes go for more than 2 weeks with refuse not collected by the responsible local authorities. Mealie meal sacks, plastic paper beans, plastic and metal beans become too small to be used for the whole months. They quickly fill up and overflow as waste is generated every day which would result in putting human health at risk. So overflowing of refuse is also another why residents of Mkoba 14 high density have resorted to open space dumping and illegal burning. Illegal open space burning produces toxic smoke that causes respiratory problems and is done near the residents. Some residents in Mkoba 14 testify that they burn refuse at their houses especially old clothes and shoes. Moreover open space dumping papers, plastic papers and other light materials are blown by the wind which causes pollution and dirtiness in Mkoba 14 high density and other nearby locations.

2.4 CORRELATION OF COLLECTION EFFICIENCY WITH COVERAGE OF RECEPTACLES

Local authorities need to establish a good correlation between collection efficiency and the coverage of receptacles. The challenge is that almost half of the respondents in Mkoba 14 cannot afford to buy the proper receptacles. There is need for serious intervention by the local authorities to provide proper receptacles to the residents in Mkoba 14. There is need to build a stronger relationship between collection efficiency and coverage receptacles, however Gweru

City council if failing to meet demand for solid waste collection, the respondents say they can even go a month. Residents need proper receptacles that meets with collection schedule of council this would prevent bad odours and spillage. Use of improper receptacle promotes illegal dumping.

2.5 FREQUENCY OF COLLECTION AND TIME SPENT ON COLLECTION.

Waste collection in Mkoba high density suburbs is done once a week in the residential areas, industrial. Responded number from Mkoba 14 said that the collection in Mkoba 14 high density suburb is done every on Wednesday. Some other respondents reported that this is not done frequently. They could sometimes go for a month or more than a month without solid waste collection. Many of the respondents interviewed in Mkoba indicated that the waste collection services were erratic and inadequate. Even the vendors at Mkoba 14 shopping centres market place reported that they could go for a week or more without their refuse being collected. The inconsistency collections do not go with the World Health Organization stipulation that solid waste should not be left for more than 48 hours at market places. Due to lack of frequency of solid waste collection at enterprises in Mkoba 14, waste stored within their premises for longer periods. Despite the fact that the waste is expected to be collected once a week in Mkoba 14 it can go for more than a week. The danger of inconsistent collection of solid waste is that the more the waste not collected people would resort to dumping on open spaces.

2.6 WASTE COLLECTION AND DISPOSAL FACILITIES BY MKOBA 14 RESIDENTS

Solid waste collection is an important factor to be considered in solid waste management. It is recommended that in high density suburbs refuse must be collected daily or twice a week since these residential areas are packed with people and they produce more waste. This remains a greater challenge for local authorities because of financial constraints and inadequate equipment. Half of the respondents in Mkoba 14 say they put their bins in the wheel barrow and carry to illegal dumpsites where there are open spaces. They testify that this is usually done during the night and many people would be in their houses. Some of the respondents indicated that they resort to open space burning as a method of waste disposal. Whilst others burn the waste at their houses because dumpsites are far away from their houses. There is another group in Mkoba 14 which resort to composting at their backyards. However this poses a great challenge because they are not safe disposal systems as they affect the environment and the health of residents. Also the dumpsites where they dump their waste are not illegal as they are not recommended to do so by the Gweru City council. This poses a great risk to their health especially diseases like cholera, diarrhoea and malaria as there would be breeding places for mosquitoes especially the compost.

2.7 SOLID WASTE SEPARATION

This can also be called waste sorting and it involves the separation of waste into different elements for disposing. It is also known as waste segregation and is mostly to separate waste according to type at the source which is the house. Waste segregation involves the sorting of waste with their types, for example biodegradable, plastics, paper and cans. Usually solid waste separation encourages quicker and easier recovery of waste at source which makes recycling easier as the waste is already separated according to type. This should be done at local level to train residents on sorting of refuse for safe disposal. In Mkoba 14, residents do not have the

knowledge of sorting or separating solid waste before disposal. Respondents said that they mix everything in one bin. If the responsible local authorities do not come for collection residents would pick their bins and throw at any illegal dumpsite or the refuse is burnt while mixed. They compost the waste like plastic papers, bottles, old shoes and these would be mixed with food leftovers, fruits, vegetables and all the biodegradable products. This shows that residents in Mkoba 14 lack the knowledge separation before disposal.

2.8 REUSE OR RECYCLING OF MUNICIPAL SOLID WASTE

Many people are used to recycling and reuse, informal waste pickers do this. Picking of waste is mostly done in cities and municipalities. Items that are usually picked includes plastic containers and bottles as they are reused for packaging cleaning them with disinfectants. According to UN Habitat (2010), recovery of waste by informal recyclers reached a maximum of 20 to 30% and had improved the lives of the poor in developing countries. Moreover, this study is in line with what has been suggested by Idris *et al.* (2004) who suggested that in most developing countries recycling was not formally done by the council or landfill operators but it was done by informal recyclers or pickers and scavengers. There is need to encourage informal waste pickers as it will minimize solid and also assist in human development. Some of the residents go and pick peanut butter bottles for selling to the informal traders who are in need of them. However, there is need for waste separation at house hold to make it safer and easier for waste pickers.

2.9 VEHICLE AND EQUIPMENT PERFORMANCE STANDARDS.

The inconsistency of waste collection and being unable to collect waste in all the settlements frequently is because of shortage of vehicles especially taking into account the growing

populations in urban areas. Another reason for shortage of equipment is because the vehicles lack service due to growing population against financial constraints by the Gweru City Council. The Gweru City Council had a great challenge in vehicle breakdown this is due to poor road conditions and inadequate vehicle maintenance. Results produced from the interviews done with the cleaning superintendent shows that they sometimes use a tractor for waste collection, but it normally breaks down and this normally results in delayed collection. The limited finances they receive are budgeted towards the maintenance of collection vehicles but still the funds are not enough. Maintaining is a great challenge especially in accessing the inventory spare parts because the vehicles used are imported from different sources. The use of old vehicles and vehicles which are not suitable for collecting solid waste and because of these issues the vehicles easily break down. This has made it difficult for Gweru City Council to frequent collection of refuse especially even Mkoba 14 high density suburb.

2.11 CHALLENGES NOTED FROM THE CITY COUNCIL AND THE RESIDENTS

Financial challenges were noted from both the city council and the residents. The council cannot afford to provide durable receptacles to residents and also the residents cannot afford to buy. However residents have resorted to illegal open space dumping and burning which poses a risk to their health and the environment.

Most respondents' responses shows that the council is struggling to fund waste collection and disposal Mkoba high density suburbs. The main reason behind as according to responses from most of the respondents indicated the failure by residents to pay refuse collection tariffs in time.

These findings go in line with results gathered from interviews with the management group. This is one of the problems that have derailed the Gweru City Council to carry out its services effectively in Mkoba 14 and other high density suburbs. The findings shows that due to financial constrains the Gweru City Council is not able to collect refuse regularly due to financial constrains as one of the contributing factors. The other respondents do not have the knowledge of the city council' by laws concurring with respondents saying the buy laws are there, but the council is not so strict on the compliance of the residents. It is clear evidence that this was one of the reasons why Gweru City Council failed to provide adequate especially domestic solid waste collection and disposal. So the residents of Mkoba 14 high density suburbs have resorted to open space or illegal dumping or burning.

CHAPTER THREE

3.1 CONCLUSION

The researcher managed to come up with the conclusions that solid waste management needs to be treated with urgent and as a serious concern. The researcher discovers that this research offers clear wider ground for further research because the challenges of waste management needs long term solutions and will also take a long time to deal with solid waste management challenges because of financial constraints. There is greater need to encourage residents to change their behaviour towards waste management.

This is so because the residents of Mkoba 14 are having a lot of challenges on issues to do with waste management. In carrying the research the researcher came across a lot of illegal open space dumping sites. To note also there is open space burning being practiced in Mkoba 14. Another challenge being faced by these residents is lack of storage receptacles and this is evidenced by use of mealie meal sacks, plastic paper bags, cardboard boxes, and sacks. This shows that waste management should be taken seriously. The greatest challenge is that this would affect human health as it promotes spread of diseases and also affect the environment. The illegal dumping and burning is because of the failure of local authorities to collect the bins frequently.

Moreso the failure by the residents to sort and grade the waste upon production shows that they lack knowledge on waste management. This would help them to reduce the risk of injury to both the waste collectors and the environment. This also helps the residents to be able to recycle and reuse some of the things they might think are not as that important. Due to burning of mixed waste some of the waste produces toxic gasses which affects the environment and has adverse effects on climate change negatively.

In Mkoba 14 the researcher notes that most people do not want to be associated with illegal open space dumping and burning. This is the most common behaviour in Mkoba 14. To surprise most of the residents do not want to be associated with behaviour of illegal burning and dumping. The residents hold the blame on the local authorities for not collecting and transporting the waste on time. However there is no need to blame anyone because the local authorities are having financial challenges. Both need to work together to come up with the solutions that would improve waste management in Mkoba 14.

The findings show that most of the waste generated in Mkoba 14 is organic which is as a result of food consumption. High density suburbs produce more waste because of most populations resides in high density suburbs.

3.2 HOW BEST CAN MKOBA 14 RESIDENTS CAN ENHANCE SOLID WASTE MANAGEMENT

There is need for joined effort for both the Gweru city council and households in Mkoba 14. These two groups should work together to improve solid waste management in Mkoba 14 high

density suburbs. However the researcher recommends both the Gweru City council and residents of Mkoba 14.

RECOMMENDATIONS TO MKOBA 14 RESIDENTS

The residents of Mkoba 14 are encouraged to use receptacles which are strong. They also should be big and last for a longer period. This is important because it reduces or avoids over spilling even the local authorities would take a longer time without coming to collect the bins.

The residents of Mkoba 14 should also be discouraged from resorting to illegal open space dumping and burning as a way of managing solid waste. This would affect both humans and the environment. Illegal open space dumping results on the spread of diseases. Illegal burning is also one of the causes of veld fires

The households also should be encouraged to separate their waste at the source. This is important because it would make recycling easier. Also this would make the work of the city council easier disposing the waste.

Households in Mkoba 14 should be encouraged to use recycling as another method. Most of the residents in Mkoba 14 do not have recycling knowledge and its benefits to households. Recycling is important as a method of solid waste management.

Mkoba 14 residents should be given a platform to come up with their own solutions to the problem of solid waste management rather being provided by someone else. These solutions should work for the whole community.

RECOMMENDATIONS TO GWERU CITY COUNCIL

The Gweru city council must provide a waste collection schedule which work effectively to the residents of Mkoba 14. This would help the residents to choose the type of receptacles which would suit the collection schedule

The Gweru city council should closely monitor the waste management methods practiced the residents. It well to reduce the levels of illegal open space dumping and burning as it is most prevalent in Mkoba 14 high density suburb

Gweru city council needs provide education to the residents. This can be done through carrying out educational campaigns. The educational campaigns help to dealt away with the ignorant residents have concerning solid waste management. There is need to educate them concerning the services provided by the local authorities and how they operate. It is a greater move because knowledge is power.

The Gweru City is also recommended to purchase more vehicles and also service the ones that are not working. This would assist them to stick to their transportation and collection schedule. This also increases collection frequency which would reduce over spilling of bins, open space illegal dumping and burning of solid waste

The council should also increase the number of skilled personnel in employing. They should provide their work force with enough protective clothing to reduce the hazards they can encounter in waste collection and disposal.

The local authorities should engage responsible authorities to make sure that fuel is available all the time for collection and transportation of solid waste. Moreover they should make sure the workforce is paid on time as this would motivate them to work.

The municipal police should be granted arresting powers and they should make sure that they arrest those who practice illegal open spacing dumping and burning. Those who continue practicing it should be made to pay a fine which would go towards servicing of vehicles. This would also improve waste management

The city council also should try by all means to provide durable and bigger receptacles to household as most of them use plastic bags and mealie meal sacks. These receptacles quickly over spills and be easily destroyed by scavengers.

However it is important to note that the Gweru City Council should also engage the business people in Mkoba 14 and also the central government. The business people can provide rewards to those households who can manage their waste properly. The government should stop from interfering into the daily running of the businesses of the local authorities as this would also improve their service delivery.

All the stake holders must see the issue of solid management as a cause of concern which needs to be treated seriously. They should work together to make sure there is proper waste management to reduce harm to both the environment and the humans.

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APPENDIX I

QUESTIONNAIRE FOR GWERU MKOBA 14 RESIDENTS

SECTION A

My name is Caroline Zvidzai a student at Midlands State University. I am pursuing a Bachelor of Arts in Development Studies Honours degree. As part of my study programme, students are required to do a field research and produce a dissertation covering an area of interest. I therefore would like to carry out a research on Solid Waste Management: examining the effectiveness of GCC in solid waste management in Mkoba 14, so lam greatly looking for your help through this questionnaire. I guarantee that the information gathered in this exercise will be strictly used for academic purposes, and the respondents' confidentiality in this exercise will be respected, no names will be published in any way. Having said this, I would kindly ask you to participate in this questionnaire.

SECTION B

Answer the questions below as briefly as possible and where possible, you can just tick the most appropriate answer.

1. Male Female
2. Age below 20 21-40 41- 60 81+
3. Highest level of education attained:
Grade 7 O' level A 'Level Tertiary
4. Place / Suburb /Location of Residence_____
5. Employed Yes No
- 6 If Yes state occupations_____
7. What type of solid waste is generated in MKOBA 14?_____

8. List down the sources of solid waste generations.

9. What mode of transport is used for the collection of solid waste?

10. Do you store different solid waste in separate receptacles? Yes No

11. What form of receptacles do you use for storage of solid waste before collection?

12. How frequent is waste being collected by the city council in this suburb?

Once per week Twice per week More than twice per week

13. Give more detail on waste collection especially comments on how it's collected.

14. Do you use composting?

Yes No

15. Do you use open space burning and dumping as a way of disposing waste?

Yes No

16. Has the town ever experienced any cases of disease outbreak related to poor solid waste management?

Yes No

17. If your answer is yes, state the disease [s] _____

18. What challenges are you facing in the management of solid waste in this Mkoba 14 ?

19. What mitigatory measures do you think can be taken to reduce these challenges faced?

APPENDIX 2

SECTION A

My name is Caroline Zvidzai a student at Midlands State University. I am pursuing a Bachelor of Arts in Development Studies Honours degree. As part of my study programme, students are required to do a field research and produce a dissertation covering an area of interest. I therefore would like to carry out a research on Solid Waste Management: examining the effectiveness of GCC in solid waste management in Mkoba 14, so I am greatly looking for your help through this interview. I guarantee that the information gathered in this exercise will be strictly used for academic purposes, and the respondents' confidentiality in this exercise will be respected, no names will be published in any way. Having said this, I would kindly ask you to participate in this interview.

SECTION B

1. How old are you?
2. What is your occupation?
3. For how long have you worked for the council?
4. Solid waste management is a cause for concern in most urban areas in Zimbabwe. Is Masvingo town an exceptional case?
5. What type of solid waste are generated in Gweru Mkoba 14 high density suburb?
6. What are the commonest sources of waste generated in Mkoba 14?
7. What mode of transport is used by the council to collect and transport solid waste?
8. Does GCC provide receptacles for storage of solid waste?
9. Do residents place solid waste in separate receptacles according to types?

10. Are there any private companies or organizations involved in the collection and Transportation of solid waste?
11. How frequent is solid waste collected in Mkoba 14?
12. What methods do GCC use to dispose the solid waste?
13. Where are the dumping and disposal sites and how are they managed?
14. How does the GCC manage the illegal dumping sites in Mkoba 14?
15. What challenges are being faced by GCC in terms of solid waste management?
16. What measures is GCC taking to address these challenges?
17. What are the effect of poor waste management in Mkoba 14?

Thank you very much for participating in this interview.