

## Challenges in Implementing Sound Solid Waste Management Practices in the Informal Sector of Gweru, Zimbabwe

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### Abstract

*This study examines the challenges faced by the waste authorities and informal sector enterprises of Gweru in implementing sound practises in managing solid waste. Dangerous substances such as sulphuric acid from batteries, used oil and chloride are dumped haphazardly by home industry owners. The sample for questionnaire surveys comprised all the 601 organised informal sector enterprises in Monomotapa high density suburb, Shamrock Park high density suburb, Mkoba high density Suburb, Ascot high Density Suburb, Kudzanai market and Kombayi market. Focus group discussions and interviews with key informants were arranged for the purposes of assessing solid waste management needs and priorities in the informal sector of Gweru and how to improve the waste management system. The main challenges in implementing environmentally sound waste management strategies included operational and logistical constraints such as inadequate vehicles and equipment resulting in erratic collection of waste, obsolete and unsuitable equipment, unqualified personnel, poorly paid and untrained workers. These challenges were attributed to the limited funding for waste management by the waste authorities in the City Council. The institutional and legislative constraints included lack of enforcement of environmental legislation, lack of environmental education, uncontrolled waste dumping and negative public attitudes on waste management and waste work itself. Among the suggested strategies for managing waste, the study recommends that of shared responsibility in waste management among the city council, the enterprise operators and the Environmental Management Agency.*

**Key words:** Sound practices, challenges, informal sector, City Council, EMA, Gweru.

### Introduction

Management of municipal solid waste is a priority for many urban communities throughout the world (Afroz *et al.*, 2010; Ali, 2010; Bartl, 2011; Huang and Chang, 2003; Brunner and Feller, 2007; Amijo-de Vega *et al.*, 2010; Lebersorger and Beigl,

2011; Zhang *et al.*, 2011). Due to rapid urbanisation over the world, the generation of solid waste has been leading to various impacts on the environment and human health. Consequently, effective management of solid waste has become an increasing challenge faced by environmental managers in both the public and private sectors (Li and Huang, 2006; Cheng *et al.*, 2008; Shastri and Diwekar, 2008; Weng and Fujiwara, 2011). However, in solid waste management systems, uncertainties may exist in a number of impact factors such as waste generation rates, waste disposal capacities, waste transportation and facility-operation costs. Such uncertainties would affect the related decision processes as well as the associated optimisation efforts (Yeomans *et al.*, 2003; Mor *et al.*, 2006; Siddiqui *et al.*, 2006, Raje *et al.*, 2001). It is thus desired that effective approaches for dealing with such complexities be developed to enhance the robustness of the planning process.

Urban solid waste management is one of the most serious environmental problems confronting developing countries (Afroz *et al.*, 2010; Sinha and Enayetullah, 2000) and the city of Gweru in Zimbabwe is no exception. Economic implosion in Zimbabwe has resulted in high levels of unemployment estimated at 80% (Hanke 2009; Kairiza, 2009; Financial Gazette, 2009 and Mambondiani 2008). This has led to the growth of home industries in Gweru in and around the city centre and high density suburbs such as Mkoba, Monomotapa, Mambo, Ascot and Senga. Solid waste generation in these suburbs is very high given their spatial extent and population. This is putting much pressure on the waste disposal system in place and as a result a lot of waste is left uncollected creating a health hazard. The shrinking of the formal sector industries in Zimbabwe has resulted in the growth of home industries in the city of Gweru. These home industries generate solid waste and sound management of the waste is the greatest challenge currently facing these industries. These activities produce high quantities of waste which could be detrimental to the environment by contributing to air, water and land pollution as well as pollution of the visual environment if the waste is not properly managed through an efficient waste management system. The informal sector is recognised as part of a waste management system in an urban environment in terms of waste recycling. Studies in Zimbabwe have made preliminary assessments on the impact of domestic and formal waste on the environment (Tevera 1991, Jerie 2005, Jerie 2006, DNR 1994 and MLGRUD 1995), but no comprehensive study has been made to determine the characteristics of waste generated in the informal sector as well as the effectiveness of the collection and disposal practices in reducing environmental pollution. Such information is vital for planning in waste storage, collection frequency and disposal so as minimise negative impacts on the environment. Studies have not clearly articulated the issue of waste generation and management in the informal sector of Zimbabwe as deserving investigation because some say it is difficult to study and probably the government

does not directly generate any revenue from this sector. This is actually contradictory to the role the sector plays in reducing the amount of waste which in turn reduces the lifespan of the disposal sites (Tevera, 1993; Jerie, 2005).

Successful mitigation measures of any problem are based on initial comprehension of the problem. Few studies have been carried out on the effects of home industries on the urban environment. Studies have been undertaken on the effects of home industries on the water quality in a tributary of the Marimba River in Harare. There is need to study the challenges faced by the waste authorities and informal sector enterprises of Gweru in implementing sound practises in managing solid waste. Dangerous substances such as sulphuric acid from batteries, used oil and chloride are dumped anywhere by home industry owners. Such substances can affect both fauna and flora. Some people who own home industries resort to burning their waste. This practice can assist in reducing the amount of solid waste, but at the same time result in increased air pollution. This research, which is derived from the author's PhD thesis, is expected to provide useful information on the present state of solid waste management in the informal sector of Gweru and hence assist the planning department in coming up with a sustainable solid waste management strategy. This will also generate data on how the activities of the informal sector can be monitored and in regulated Gweru and Zimbabwe as a whole.

### **Methodology**

The study population for questionnaire surveys comprised all the 601 organised informal sector enterprises in Monomotapa high density suburb, Shamrock Park medium density suburb, Mkoba high density Suburb, Ascot high Density Suburb, Kudzanai market and Kombayi market. Focus was on these areas because of the large concentrations of informal enterprises characterised by a diverse range of enterprises that include retail, service, repair, manufacturing and construction activities. In Monomotapa 47 out of 51 enterprises agreed to participate in the survey. At Shamrock Park there was a combination of informal sector enterprises and small-scale and medium scale enterprises. All the 57 informal sector enterprises were selected to participate in the survey and these were those with less than 10 employees and the small scale and medium scale enterprises were left out since they did not meet the criteria for defining informal sector enterprises. All the 182 enterprises at Kudzanai who were allocated with stalls from which they operated were involved in this study and participated with keen interest and the majority are retailers of food and clothing. The other market area near the city centre is at Kombayi and all the 29 informal enterprises who were allocated stalls participated in the study and as at Kudzanai these are mainly food and clothing retailers. In Mkoba and Ascot High density suburbs the majority of enterprise operators

participated in the survey and the very few who declined to participate were either suspicious or simply uncooperative. Out of a total of 229 enterprises in Mkoba, 224 participated from the sections of Mkoba 6, Mkoba 14 and Mkoba 16 and in Ascot a total of 50 out of 53 enterprises participated in the study. All in all 589 enterprises participated in the questionnaire survey and these were categorised as shown in Table 1.

**Table 1: Categories of informal enterprises in the six spatial locations**

Spatial Location	Enterprise Category					Total
	Retail	Service	Repair	Manufacturing	Construction	
Monomotapa	7	3	11	17	9	47
Shamrock Park	6	1	8	18	24	57
Kudzanai	143	11	13	12	3	182
Kombayi Market	24	1	2	0	2	29
Ascot	25	7	10	7	1	50
Mkoba 6, 14, 16	74	31	40	59	20	224
<b>Total</b>	<b>279</b>	<b>54</b>	<b>84</b>	<b>113</b>	<b>59</b>	<b>589</b>

A number of key stakeholders involved with the solid waste management sector were also identified and these included public institutions and government ministries, waste management service providers and their clients as well as non-governmental organisations and some local doctors specialising in occupational safety and health and epidemiology. In the Ministry of Local Government, Rural and Urban Development, two officials involved with urban development were interviewed formally using structured interview guides. The Gweru City Council is directly involved as a waste management service provider and five interviews were conducted with the physical planner, the Amenities Division Manager, the Senior Health Environmental Officer, the Cleansing Supervisor and the city chemist. Interviews were also conducted with the Education and Publicity, and the Planning and Environmental Impact Assessment officers of the Environmental Management Agency. The National Social Security Authority's Principal Factories Inspector was also interviewed on issues pertaining to occupational safety and health in the informal sector. Chairpersons of the informal sector enterprises in each of the spatial locations are key in providing in-depth information on issues relating to solid waste management that include generation, collection disposal and options for an environmentally sustainable waste management system and these were interviewed.

Questionnaire surveys were used to realise the immediate objectives of the research



as well as to gather data on the informal sector of Gweru. The questionnaire was developed to cover aspects of the objectives to investigate issues concerning informal sector enterprise waste generation and disposal practices, availability and type of waste disposal services as well as perceptions on the waste management situation in the informal enterprises and how the system can be improved. The questionnaire administered to the home industry operators aimed at collecting information on the quantity and type of waste produced waste collection and disposal practices and the enforcement of legislation. The instrument was divided into appropriate sections to allow for the systematic collection of data from the enterprises in the different spatial locations of Monomotapa, Shamrock Park, Mkoba, Kudzanai, Kombayi Market and Ascot.

Interviews were for the purpose of gathering information on waste management system in Gweru's home industries, occupational safety and health problems associated with solid waste management, planning for waste management in informal enterprises, environmental impact of waste produced in the home industries. The interviews are to target policy makers and planners in the organisations dealing with waste management. Focus group discussions were arranged for the purposes of assessing solid waste management needs and priorities in the informal sector of Gweru and how to improve the waste management system.

## **Results and discussion**

### **The major stakeholders in solid waste management in Gweru**

The main players involved in waste management in the informal sector of Gweru include the Central Government, through various Government Ministries and Departments, the Non-Governmental organisations and private sector organisations. Three Government Ministries are directly involved in the management of waste at national level and these are the Ministry of Environment, the Ministry of Public Works and Urban Development and the Ministry of Health and Child Welfare and their functions include regulatory as well as monitoring ones. The Ministry of Environment, through the Environmental Management Agency provides the framework for waste management through the Environmental Management Act. The Act empowers the Agency through the standards and Enforcement Committee to recommend to the Environmental Management Board (EMB) measures for handling, storage, transportation, segregation and destruction of any waste and set standards for waste and their classification. The committee is also empowered by the Act to prohibit the discharge or disposal of any wastes in a manner that causes pollution of the environment or ill health to any person. The Environmental Management Act repealed the Atmospheric Pollution

Prevention Act and the Hazardous Substances and Articles Control Act both previously administered by the Ministry of Health and Child Welfare. The Environmental Act further amended the Water Act by bringing all water pollution issues under the Ministry of Environment. Most major issues related to waste management are therefore under the Ministry of Environment being administered by the Environmental Management Agency. Provisions of the Ministry of Health and Child Welfare enforce the provisions of the Public Health Act. The Act regulates all activities with the potential to jeopardise public health. Waste management, by virtue of the threat it poses to public health is regulated through the Public Health Act. Environmental Health Officers and technicians have been employed by the Ministry and duties involve advising on waste disposal issues. The Ministry of Local Government administers the Urban Councils Act (Cap 29: 15) which is the principal Act by which urban council areas are designated. The Ministry delegates the management of wastes to local authorities through the same Act. Urban local authorities are empowered by the Act to make by-laws for regulating urban functions and activities. The Ministry approves all local authority by-laws before they become operational in the urban area concerned.

#### Perceptions on the best institution to manage waste

Perceptions of the enterprise operators captured in the questionnaires indicated that the Gweru City Council was regarded as the best institution that had the capacity to manage solid waste generated in the informal sector through the provision of adequate and environmentally sound collection and disposal facilities (Table 2). The association between institution regarded as best to manage waste and enterprise activity was found to be statistically significant using Pearson's Chi-Square test ( P value of 0.017 <0.05 and a likelihood ratio of 0.023).

**Table 2: Perceptions on the best institution to manage solid waste in the enterprises**

	Enterprise activities					Total
	Retail	Service	Repair	Manufacturing	Construction	
N/A	1	0	0	2	0	3
City council	147	28	40	67	25	307
Private organisation	41	3	17	16	13	90
Govt and private jointly	71	17	18	18	9	133
Individuals	19	6	9	10	12	56
<b>Total</b>	<b>279</b>	<b>54</b>	<b>84</b>	<b>113</b>	<b>59</b>	<b>589</b>

Despite the fact that the enterprise operators felt that the council had the best mandate to manage solid waste in Gweru, they indicated that the waste management institutions that were involved in waste management were weak (Table 3) due to reasons that ranged from lack of clear strategies for environmental action, lack of enforcement of legislation, lack of public awareness lack of financial resources, lack of resources such as equipment and the general lack of commitment to the waste management problem. These constraints are discussed in the sections that follow.

**Table 3 Perceptions on the level of weakness of institutions in managing waste**

Spatial Location	Waste institutions weak					Total
	agree strongly	agree	moderate	disagree	N/A	
Monomotapa	18	10	7	11	1	47
Shamrock Park	14	17	10	15	1	57
Kudzanai/	40	61	35	39	7	182
Kombayi Market	6	10	10	3	0	29
Ascot	6	13	8	19	4	50
Mkoba 6, 14, 16	39	141	35	9	0	224
<b>Total</b>	<b>123</b>	<b>252</b>	<b>105</b>	<b>96</b>	<b>13</b>	<b>589</b>

Only 18% of the 394 respondents who were dissatisfied with waste conditions in the informal sector revealed that they had reported such dissatisfaction to the city authorities. The percentages making such reports did not differ significantly among the spatial areas ( $P < 0.01$ ). Of the respondents who did express their dissatisfaction, the most common authority to whom such information was reported was the waste collector (71%), followed by the city council (67%), the local residents association (34%) and the local residents (15%). There were significant differences among the spatial areas on authorities to whom the enterprises reported unsound solid waste management with most reports being made by enterprises located in Shamrock Park (78%) followed by Monomotapa (65%) and Mkoba (51%).

A total of 387 respondents reacted negatively to open dumping of waste by some enterprise operators and the most common reaction was for them to say nothing or even do nothing because they did not want to offend the offenders. However, 36% of these respondents did not have an opinion, 16% indicated that they tried to prevent enterprise operators from disposing of waste in open spaces and 44% revealed that they kept quiet because other peoples' actions did not concern them. The reactions of the respondents differed significantly among the spatial locations

with the first reaction among the enterprise operators being greatest in Shamrock Park (63%) and least at Kudzanai market (11%), the second reason was greatest in Mkoba (66%) and least again at Kudzanai (9%), the third was greatest at Shamrock Park (71%) and least at Monomotapa (32%) and the last reason was greatest at Kudzanai (86%) and least at Ascot (42%).

In terms of picking up solid waste dumped by some enterprise operators, only 36% of the respondents were positive in doing so and this was mostly because they wanted to reuse the waste, recycle or sell for earning a living. However, 69% of the enterprises indicated that they had never picked the solid waste dumped in open spaces and 12% indicated that they 'often did so' and incidents of picking up dumped waste was in cases where the waste was dropped in the vicinity of their enterprises. The differences in the frequencies differed significantly among the spatial areas ( $P < 0.05$ ) and the first response was greatest in Shamrock Park (66%) and lowest at Kudzanai (8%), the second was greatest at Kudzanai (92%) and lowest at Mkoba (37%) and the third response was greatest at Monomotapa (54%) and lowest at Kombayi market (43%)

### **Challenges in implementing environmentally sound waste management practices**

The focus group discussions conducted in the informal sector enterprises revealed a number of constraints and barriers to the implementation of environmentally sustainable waste management strategies for the City of Gweru. It was agreed that the solid waste generation rates generally exceeded the collection and disposal capacities of the City Council of Gweru. The city council officials pointed out that 'Our collection capacities range between 65% and 75% in all the residential, industrial, institutional and other areas of Gweru City, but in areas such as hospitals and those close to the city centre the collection capacity is close to 80%.' This assertion was, however, disputed by the participants of the focus group discussion and one middle-aged enterprise operator vehemently disagreed with the city council representative who argued that:

*'I have been operating as a trader here at Kudzanai market for the past 12 years and have observed that the waste collection capacity of the city council as well below the percentages that have been given by the council officials... and my estimation through personal observations would put it at 20-30%. Just look at the heap of waste at the exit point of the market and bus terminus here...that heap of solid waste has been accumulating there for the past one and half weeks a clear indication of the ineffective collection and disposal capabilities of the council.'*

This argument by the enterprise operator was true since all of us could see a huge

heap of waste that showed clear signs of having accumulated for a very long time and the organic waste was already in an advanced state of decay and the whole area was heavily infested with flies and a heavy odour made the area unbearable to work in. There were a number of factors that were also identified by the discussion groups as contributing to the poor waste management practices in the informal sector enterprises. The following factors were thus collated and identified as contributing to the waste problem in the informal sector enterprises.

### **Operational constraints**

A number of logistical constraints hinder effective solid waste management in the informal sector enterprises of Gweru and these are essentially socio-economic in nature and mainly as a result of inadequate financial resources. This was also revealed in the interviews with the Senior Environmental Health Officer in the waste management department of the City of Gweru who noted that, 'These are difficult economic times in our country and as a council we are operating on a shoe-string budget and hence we do not have enough funds for effective solid waste management in the city.' He went on to indicate that:

*'Financial resources are important to support the collection and disposal and this includes the purchase of waste collection receptacles such as bins, appropriate vehicles such as compactors, to purchase spare parts for the operating vehicles, fuel, servicing the vehicles and above all the salaries of workers that constitute the largest portion of the wage bill. The provision of sustainable waste management services has been crippled by the lack of reliable sources of funding and whenever funds are available they have to be shared among many other demanding services that have to be rendered to the residents and industries of the City of Gweru.'*

The provision of solid waste management services in the City of Gweru has been a mammoth task for the waste managers since the available resources are inadequate for the day to day operational costs. This has resulted in poor area coverage in terms of waste collection services hence the erratic collections experienced in the informal enterprises of the city. In response to the allegations made by the senior enterprise operators at Monomotapa that the problems of erratic collections could not be attributed to lack of funds, the Cleansing Supervisor in the Gweru City Council had this to say:

*'This problem of financing waste management needs to be approached with caution and an open mind. Our operations are guided by the desire to provide a comfortable living environment for the Gweru community, including the informal sector enterprises. Solid waste management really consumes a huge part of our shoe-string budget and the funds are really not there. The wage bill for council employees*

*is proving to be too large and a big headache for the finance division and the sources of income have been contracting each day. It has been therefore difficult to pay council workers on time and these include waste workers...imagine the impact this has had on the morale of the people who are supposed to clean the environment for the Gweru community.'*

These sentiments by the senior council official were supported by a member of the waste collection crew who observed that, 'we are really worried about this finance problem affecting the Gweru City Council...we cannot get paid and buy bread for our families and how do you expect me to work well in my waste collection duties?'

Collection of solid waste in the informal sector is negatively affected by the unavailability of adequate vehicles and other equipment in the Gweru City Council's Health department. Council has to depend on its own resources in order to purchase essential equipment for managing waste, but the resources are inadequate as noted by a senior engineer in the Gweru Council who observed that, 'We have very few vehicles to cover the whole of Gweru and hence the inability to stick to optimum waste collection frequencies in most parts of the city that include the formal sector enterprises. Some of the vehicles we should have been using for waste collection are broken down and it is very difficult to get the appropriate spare parts to repair them.'

It has also been observed that in order to undertake solid waste management satisfactorily there is need to have a wide range of qualified personnel such as engineers, mechanics, administrators, sanitation officers, finance and accounting staff and researchers (Armah 1993; Tamakloe,2006). The Gweru City Council lacks such a wide range of personnel especially engineers who advise on issues such as suitability of equipment, design, construction and maintenance of waste disposal facilities. There are limited training opportunities for the personnel in as far as sustainable practices of waste management are concerned such as waste minimisation and recycling because the waste management issues are handled mostly by incompetent staff. In such cases the solid waste management practices are essentially limited to just collecting and dumping without making any efforts at reducing or minimising it. The problem of resources for funding solid waste management is not peculiar to the Gweru City Council, but it is also evident in Africa has been highlighted by many authors who include Cointreau (2006).

Scarcity of resources was established to be a major hindrance in effective solid waste management in the informal sector of Gweru and in Zimbabwe in general.

Firstly, the provision of waste management services in any city is expensive and this makes a huge constraint on the finances of most local governments (Armah 1993; Onibokun 1999; Pacione 2005). Financial resources are important in the acquisition of capital equipment, for the daily operational costs such as procurement of fuel, spare parts and personal protective clothing. The Amenities Division Manager in the City of Gweru emphasised the problem of finance in as far as it affects waste management services when he noted that:

*'Finance is the cornerstone for effective waste management...every aspect of waste management is sustained by the availability of funds. In order to sustain an efficient solid waste management system, it is vital for local governments to have a constant and reliable inflow of funds so as to cover the service costs. Generally funds are scarce in Zimbabwe and this is the situation in which the Gweru City Council finds itself in as far as the funding of waste management services is concerned'.*

A number of factors were established to be the major causes of the financial problems faced by the city of Gweru in waste management service delivery. According to Armah (1993) any organisation that relies on central government subvention to deliver a waste disposal service will be strangulating itself and does not operate a sustainable service. He argues that the most effective way of getting revenue to cover the costs of waste management in any city is a system of direct charges that allows some cross subsidy from high income to low income residents and from the commercial and industrial sectors to residents. According to the Cleansing Supervisor in the City of Gweru's Health Department the major reason for the low revenue base of the municipality is 'the lack of capacity to generate local revenue.' The survey revealed that there are several local sources for the municipality of Gweru to raise funds for waste management and other services that include property taxes, licence fees for various businesses, parking fees, market fees, building permit fees and other administrative charges. However, city authorities have not been able to take advantage of these sources due to the lack of qualified finance staff. Besides, some of the informal sector operators have been exempted from payment of waste disposal levies and this has tended to deny the municipality the much needed funds for waste management. It has been observed that while most operational costs of waste management in Gweru are incurred in waste collection, most of the informal operators do not pay levies for waste disposal. Traders in the market areas at Kudzanai, Mkoba, Ascot and Kombayi market in most cases have a central container in the form of a skip or open spaces for dumping and do not therefore pay directly for waste disposal save for the daily market dues they pay which do not go to the waste management department. This situation denies the municipality of Gweru the much needed revenue for waste management.

### **Legislative constraints**

Participants in the focus group discussions revealed that there is lack of enforcement of legislation against indiscriminate dumping of waste. Most indicated that the municipal policing agents are invisible when it comes to the enforcement of City By-laws that provide guidelines for waste management in the informal sector. One female participant noted that, 'We hear of the existence of laws against littering or dumping of waste in Gweru and Zimbabwe at large and yet there is a lot of garbage that is seen thrown right at the doorsteps of our enterprises or households and yet there is no legal action taken against the offenders. Really where are the authorities? Where is EMA and where is the Ministry of Health?' There was also concern on the lack of focus on best practice in as far as the legislative framework is concerned and this was in reference to sustainable approaches of waste prevention, waste minimisation, collection and disposal in as far as the informal sector was concerned. This was regarded by the respondents as significant so as to curtail the opportunities for open dumping that were presented by the easily available open spaces in the vicinities of the informal sector enterprises of Gweru. The City Council authorities though defended problems with lack of enforcement of the by-laws as a result of inadequate manpower to police all the spatial locations of Gweru and this included the informal sector enterprises. In order to be able to monitor all the areas there would be need to employ more workers and this was not possible due to limited financial resources.

### **Inadequate environmental education**

Most of the participants in the focus group discussions argued that there was minimal if any public education on matters pertaining to solid waste management and let alone environmental management. This has resulted in indiscriminate dumping and littering and this was emphasised by an elderly man who is an enterprise operator who emphasised that, 'Some of us did not get far enough with our education and we need to be educated on environmental management and especially how to manage solid waste generated in our enterprises. Indeed we know very little on how to manage waste and well, I don't know who or which organisations should educate us on waste management issues.' This assertion is a revelation that not much is being done by organisations that should be educating people on environmental issues and such organisations include the Environmental Management Agency (EMA) which falls under the Ministry of Environment and Natural Resources. EMA has an education and publicity



department and an interview with the officer in charge of the department reveals that the agency did not have enough resources to undertake public education and awareness campaigns that covered all informal sector enterprises. There has been poor dissemination of information concerning environmental education on the consequences of improper handling of solid waste due to the low priority given to environmental issues in the national media especially the electronic media in the form of radio programmes. The radio programmes tend to focus on music and general news at the expense of environmental education programmes and organisations such as EMA have found it also expensive to sponsor environmental education programmes as observed by the education and publicity officer when he noted:

*'The radio and television programmes could be extremely helpful in educating the people on environmental issues such as the problems associated with improper disposal of waste. These types of media, particularly the radio, are very important since they are available in most parts of the country and could be useful in dissemination of environmental management issues in all the local languages. However, financing such programmes on a regular basis is quite expensive and unsustainable considering the delicate financial situation our organisation finds itself in.'*

The Senior Environmental Officer in the Gweru City Council indicated that there was indiscriminate dumping of waste in the informal sector enterprises due limited environmental education among the operators. He noted that , 'Our problem as council is that we are so concerned only about the modus operandus of waste collection and disposal...the trucks, frequencies and where to dump the waste and we forget about educating the generators of that waste on sustainable ways of disposal...it's really an issue that needs attention.' Attitudes of the Gweru community on waste management need to be changed and this would require the collaboration of all stakeholders involved with waste or environmental issues. The problem of poor environmental education has been experienced elsewhere in Africa where most local authorities give low priority to awareness issues in as far as waste management is concerned. Studies undertaken in Nigeria by Koehn (1992) and Onibokun and Kumunyi (1992) and in Zimbabwe by Tevera( 2004) indicate the low priority given to waste management by the local authorities and central government. When asked about the most vital functions that were offered by the Gweru City Council, a Senior Official in the council had this to say, 'The most vital functions provided to the Gweru community included the following in descending order of importance: revenue collection, water supply agricultural services, medical,

community development, maintenance, maintenance of law and order and market and vehicle parks.' It can be noted that waste management and sanitation were not regarded as important functions by the local government of Gweru. This thus explains the poor waste management situation in the informal enterprises as well as in the city in general.

The IUCN (1971) defined Environmental Education as:

'...the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-related among man, his culture and his bio-physical surroundings. Environmental education also entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality.'

Martin (1975) cited in Philips (1993) notes that

'...Environmental education does not ultimately have validity unless it also involves education to change the human environment for the better by understanding on the one hand the political processes by which this can be done as 'participating citizens'; and on the other hand, as noted by conservationists and other environmentalists, by acquiring an environmental ethic and knowledge of the ecological basis of life, on which value judgements about the environment can be based.

Environmental Education is vital in that it would enable the informal sector enterprise operators to acquire an awareness and sensitivity to the total environment in terms of problems emanating from waste disposal. Education on the environment would also be of assistance in gathering experience in, and acquire basic understanding of, solid waste disposal and its environmental impact. The enterprise operators would acquire the necessary set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection in the informal sector. Environmental education is a vital tool in that it would assist the informal operators to acquire the necessary skills for identifying and solving environmental problems associated with unsound methods of waste disposal in the different spatial locations. Indeed when educated, the individual enterprise operators would be obliged to be actively involved at all levels in working toward resolution of environmental problems associated with waste generation and disposal.

### Socio-economic factors

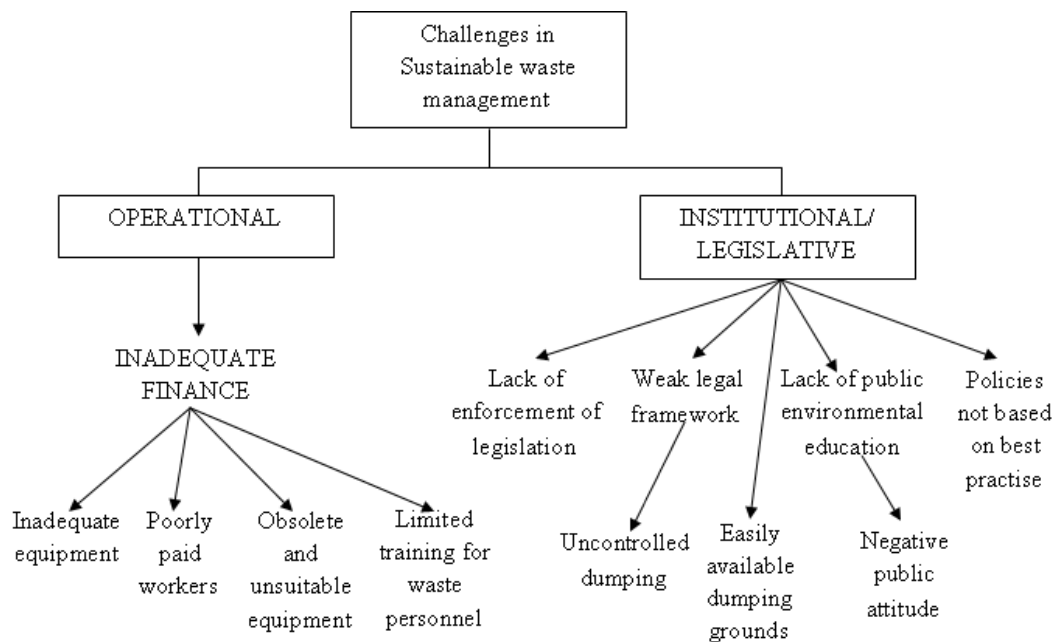
In the City of Gweru most people struggle for survival and environmental considerations are often consigned to the background of individual priority lists and this was so in studies done elsewhere by Tonglet *et al.* (2004); Timlett and Williams (2008); Mbeng (2009) since a large proportion of the Zimbabwe's population is living below the poverty datum line. The City Council is experiencing immense challenges in paying monthly wages to its workforce due to limited income from the ratepayers. The result is that very limited funds are set aside for waste management services, let alone the purchasing of modern waste collection vehicles and waste receptacles. The result of limited funding for waste management in the City Council of Gweru is that not much can be set aside for public education on solid waste management.

The shortage of funds for solid waste management has also resulted in a shortage of personnel to work in the waste management department because of the poor remuneration. There is glaring lack of expertise in the waste management department of the Gweru City Council as noted by the Senior Health Environmental Officer:

*'Expert advice on issues related to sound solid waste management practices in the informal is a critical requirement and we do not have the professionals to man this field. These professionals are essential in advising us on the trucks suitable for waste collection in the informal sector enterprises as well as other parts of the city. These professionals are also important for the repair and maintenance of waste vehicles and equipment as well as the care and maintenance of waste disposal sites of the city. We also need such personnel as researchers to undertake empirical research on solid waste management issues such as the type and amount of waste generated, collection and transportation as well as issues related to planning strategies for effective disposal of the waste.'*

The problems related to shortage of waste management personnel could therefore be attributed to the generally poor remuneration related to public sector institutions in Zimbabwe and the Gweru City Council is also a victim of this situation. The waste management sector has been a victim of the poor conditions of service which include low wages, low housing allowances, low transport allowances and unavailability of other attractive packages that would be associated with the private sector. There has thus been a flight of skills from the public sector to the private sector and this has affected the delivery of solid waste management services in the informal sector of Gweru. Figure 1 summarises the

challenges in developing an environmentally sound solid waste management system in the informal sector of Gweru.



**Figure 1. Challenges in sustainable waste management in the informal sector of Gweru**

### **Options suggested for an environmentally sound solid waste management system**

A sound solid waste management strategy for the informal sector operators of Gweru should aim at minimizing the negative impacts on the environment in the form of air, water, land and pollution of the visual environment. The focus group discussions conducted in the enterprises came up with three options that were suggested for a sustainable waste management strategy for the city of Gweru.

#### ***Option 1: Shared responsibility***

The first option gave shared responsibility of solid waste management by the Gweru City Council, the informal enterprises and the Environmental Management Agency. The operators indicated that they would have three important roles in

such an arrangement. Firstly, they would encourage more solid waste recycling over and above what was already taking place through selling and trading of waste through advertisements in the informal enterprises of Gweru. Secondly, the enterprise operators agreed that waste was only useful when not mixed with other types of waste. An example that was given was that of wood shavings are useful for recycling purposes if not mixed with organic matter and/or metals. The enterprise operators thus agreed to the sorting of waste by themselves into its various constituents since this was vital as it made recycling much easier. Thirdly, the participants agreed to be responsible for the monitoring of waste disposal into skips by the enterprise operators. However, there are impediments such as illegal traders outside the enterprises who are very difficult to monitor and to control and these traders are not responsible to the enterprise officials. The participants thus suggested to be assisted by that Gweru City Council by controlling or evicting these illegal traders since these traders are said to be responsible for carelessly dumping waste on the ground outside the skips. The participants in the focus group discussions suggested that the Gweru City Council needed to continue providing collection and disposal services, but needed to incorporate the above recommendations. It was also suggested that the Gweru City Council could also assist in the sale of sorted waste materials to recycling companies and also provide guidelines environmentally friendly ways of waste disposal and collection in the informal enterprises. The Environmental Management Agency was identified as a critical organisation in educating the informal sector operators on environmentally sound solid waste management practices such as reduction of waste at source, re-use and recycling. The education and publicity officer at the Environmental Management Agency in Gweru noted that environmental education was important in raising awareness among the enterprise operators when he said:

*'Most of the enterprise operators did not have any education nor training in environmental issues...hence the low level of awareness. Some of them did not go far enough with their secondary or even their primary education. Educational campaigns and workshops could be vital in raising the levels of environmental awareness and this includes sustainable ways of managing solid waste. Educating the enterprise owners would be vital since they would also disseminate the information to their employees, families and other members of the community. As EMA we need to be more aggressive in as far as environmental education among members of the informal sector are concerned.'*

The Ministry of Education, Sport and Culture and the Ministry of Higher and Tertiary Education were also challenged to play a greater and more conspicuous role in dissemination of information on environmental management through awareness campaigns, workshops, seminars and above all the inclusion of

environmental education in the curriculum as an examinable subject and this was echoed by one youthful enterprise owner when he noted:

*'The academic institutions really have a significant role in educating us all on solid waste management issues as well as environmental issues. I acknowledge the fact I was able to read and write because I went to school and in the same vain these institutions could start educating people on sustainable waste management practices such as waste prevention, re-use and recycling right from primary school. I for one learnt about environmental management years after I had left school...we need these issues to be taught to us early enough in our academic lives and maybe we can save planet Earth.'*

This option of shared responsibility between the Gweru City Council, the Environmental Management Agency and the informal enterprise operators was ranked as the most important in all focus group discussions since it empowers the home industry operators by becoming part of the decision making process in solid waste management since they can also provide solutions for the problems of managing waste in the enterprises. One disadvantage that was highlighted by the group participants was that the operators may not have enough support from the waste recycling companies.

### *Option 2: Waste management in the hands of the City Council*

The second option is one that places the entire responsibility of waste management on the Gweru City Council. The majority of participants agreed that the Harare City Council needs to continue providing temporary storage facilities (skips) although the members noted that the skips were not the best method since these are not suitable for the disposal of types of waste such as car shells which may fill the whole skip. The participants of the focus group discussion expressed their dissatisfaction with the erratic collection frequencies of waste in the informal sector by the Gweru City Council and hence this was viewed as inefficient in reducing environmental pollution. However, the operators were assured of collection regardless of the erratic collections. Most of the people involved in the discussion felt that there was need to increase the number of skips and other waste receptacles and to ensure a more reliable collection service by the council. The advantage with this method is that the operators are assured of waste collection service, however, the major disadvantage is that the council does not have full appreciation of waste related problems since the enterprise operators are not part of the decision making process. This is an option unlikely to be sustainable because operators should be made to be accountable for their resources. The problem with this option is that the management process is top-down and hence does not promote

sustainable management of solid waste as noted by the chairperson of the enterprise operators at Monomotapa:

*'Giving all the solid waste management duties and powers to the City Council of Gweru is suicidal and I mean that we the stakeholders would not to be consulted at all at all. It is important to involve us because we could advise on the areas that the councillors cannot discern by themselves. I believe the waste management authorities need the involvement of all of us for waste management to be a success since this promotes transparency and curtails any opportunists from corruption. The problem with a top down approach is that all decisions can be made by just one individual who might make serious errors in the delivery of waste management services and might favour certain areas at the expense of others.'*

There was consensus though among some participants of the focus group discussions that council's decisions would be adhered to once they consulted the enterprise operators on sustainable solid waste management practices. This is a view that was expressed by an enterprise operator who was a motor mechanic and had recently graduated from the poly-technical college when he argued that, 'Should we be sensitized and involved in decision making we are bound to support re-use and recycling as well as avoiding dumping waste everywhere and burning of waste can be avoided because of its impacts on human health.' The environmental health officer who represented council in the focus group discussion agreed with the views of the mechanic when she said, 'Decision making by us in council needs to be complemented by views from you people on the ground since you are directly in touch with the situation obtaining in as far as waste management is involved. Thus for the waste management system to be sustainable there is need to involve the operators for they are the main stakeholders group in as far as I am concerned.'

Though this option which gave waste management responsibilities to the Gweru City was the second most popular, it was clear that the participants in the focus group discussions felt that the enterprise operators and other stakeholders needed to be consulted in decisions that fostered sustainable solid waste management practices. A system that does not consider the views of stakeholders is almost certainly bound to yield an unsustainable system,

### ***Option 3: Waste management in the hands of enterprise operators***

The third option that was suggested places responsibility of solid waste management on the informal sector enterprises. The participants suggested that there was need to promote the application of waste management projects such as

composting of organic matter especially that generated in the market areas at Kombayi, Kudzanai, Mkoba and Ascot. An enterprise operator at Ascot was adamant that much more needed to be done in order to encourage people to take composting projects seriously when he said:

*'In the City of Gweru there has not been any successful composting project to convince people to undertake composting as an option for solid waste management. There is need to have such examples being undertaken even in the larger cities such as Harare and Bulawayo especially so in the informal enterprises. Yes, a lot of food and vegetable waste is ending up in the landfills in Zimbabwe and this should not be the case and we need to be convinced on the capacity to be able to segregate solid waste and compost it... there is need to take on aggressive steps to convince people if it is to be successful.'*

Some operators in the informal enterprises at Shamrock Park and Monomotapa had machinery for processing scrap metals although this equipment needed to be repaired. This option was regarded as potentially viable, but it was too early for them to undertake such responsibility on waste management issues. Firstly, the participants felt that attitudes towards waste management needed to change among the operators in order to be effective and secondly they needed an example of a successful organic matter processing project in Zimbabwe. The third constraint was that of the lack of financial resources to undertake the projects as observed by a metal worker at Monomotapa who said, 'I do not think we can manage solid waste on our own at this moment in time considering the huge investment that has to be made in terms of financial and physical capital resources. We are struggling to buy raw materials for our simple manufacturing activities and what more such projects of waste management.' This is an option that can only be successfully implemented with the availability of financial and technical resources and the operators need to be well educated on waste management issues. These problems hinder the successful implementation of this option at this stage.

## Conclusion

The success of any solid waste management system depends on the involvement of stakeholders affected by the waste problem and in this context the enterprise operators constituted the major stakeholder group. The major problem that was cited by most enterprise operators was the lack of consultation by the City Council's



waste management department on issues relating to waste collection frequencies and disposal which directly affected them. The decision making process in the City of Gweru's Health department was regarded a potent source of unsound solid waste management practices in the enterprises as echoed by a vegetable vendor at Kudzanai who took me to a nearby area that was supposed to have adequate receptacles for handling the waste.

Decision making that does not involve the major stakeholder group is unproductive and hence the dearth in knowledge on sustainable waste management practices such as re-use and recycling as well as controlled disposal. It is therefore recommended that the first option suggested in the focus group discussions that places responsibility for solid waste management in the hands of all the stakeholders (shared responsibility) be adopted since it promotes a participatory approach. Such an approach provides checks and balances on those players not performing their role in minimising waste generation and not adopting sound disposal practices.

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