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Challenges of Solid Waste Management in the Central Business District of the City of Gweru in Zimbabwe

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Abstract

Solid waste management in urban environments is a topical issue and is taking a centre stage in Zimbabwe. Urban centres are grappling with the problem of solid waste. This study aims to: (i) identify the reasons why solid waste management continues to be a problem in the Central Business District of Gweru City. (ii) identify the areas worst affected by poor management of waste. (iii) recommend better ways of dealing with solid waste. Questionnaires, interviews, observation and moisture content tests were used in the study. The results reveal that poor attitude by members of the public, lack of resources by the municipality, and lack of complementary action by stakeholders contributed to poor solid waste management practices in the City of Gweru. It is recommended that community education and awareness campaigns should be intensified, the business community should be involved in waste management, alleys should be closed and legislative issues should be tightened**.**

Background

Poor municipal solid waste (MSW) management is threatening the urban environments in the developing world (Hardoy, 2001). According to Chenje (2000) consumer waste in the Zambezi Basin of Zimbabwe is increasing at alarming rates due to rapid economic and population growth in the urban areas. Chenje goes further to say Lusaka the capital city of Zambia, produces 1 400 tonnes of solid waste daily of which only 10 per cent is collected. This is due to a number of factors, which include lack of human, financial and material resources. In Zimbabwe, about 60 per cent of the MSWs generated in cities is transported to the dumpsites. The wastes that are

not transported to official disposal sites, are usually dumped illegally in undesignated areas such as storm water drains, open spaces, alleys and road verges, (Masocha and Tevera, 2003).

In May 2005 the government of Zimbabwe instituted a clean up operation called 'Operation Restore Order' dubbed 'Operation Murambatsvina' which, when literally translated, means 'No tolerance to dirt'. One of its objectives was to deal with the problem of waste in urban areas. The problem of waste in Zimbabwe has led the government to come up with an environmental management act. The Environmental Management Act (CAP 20:27), (EMA CAP 20:27) ensures that there is sustainable management and protection of the environment. It makes it mandatory for people or organizations to discard litter only in containers provided for that purpose, or places designated for such purposes. Despite these measures, waste continues to be discarded, dumped or left outside the receptacles.

Some local scholars (e.g. Masocha and Tevera, 2003; Tevera, 1991; Sanyanga and Masundire, 1999) have carried out studies on illegal dumping of solid wastes in residential areas; on waste management in general; and on open waste dumps. Little research has been done on waste management in CBDs in particular, and its potential threats to the public and the environment. This study, therefore, seeks to (a) identify why illegal disposal of waste continues to take place in Gweru's CBD, (b) assess the threats poor waste management poses to the people and the environment, and, (c) suggest what could be done to improve solid waste management in the CBD of Gweru.

Study area

The city of Gweru (Fig. 1) is the capital city of the Midlands Province in Zimbabwe. It is situated approximately 275 km south west of Harare, the national capital city. The City of Gweru has an estimated population of 140 806 people (CSO, 2002). The CBD of Gweru is a hive of commercial activities, which include banking and retailing. Informal activities such as vending of food (fruits, mealie-cobs, ground nuts), fruit juices, and cell phone top-up cards are common. The CBD has a number of neglected open spaces, with grass growing. It also has a number of alleys (service lanes) with deposits of garbage.

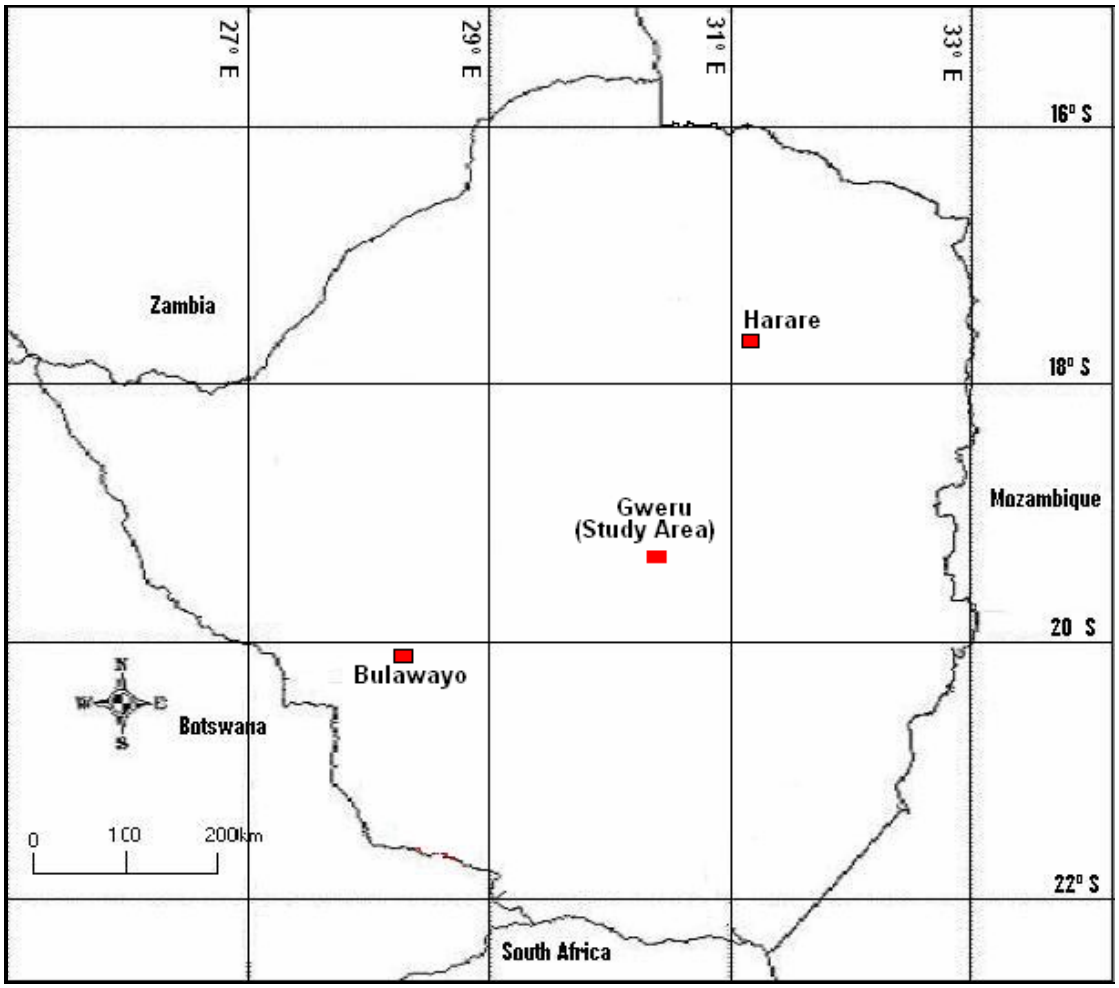

Figure 1: Map of Zimbabwe showing location of study area (Gweru)

Methodology

A case study on solid waste management was carried out in the CBD of Gweru. A survey was conducted between March and April in 2005. Observations, interviews and questionnaires were used to collect data on waste management in the CBD. Observations were made on how members of the public contribute to solid waste management. Observations were also made to check on the frequency of solid waste collection in the city. This set the groundwork for interviews. These were held with the Cleansing Superintendent, street cleaners and members of the public. Questionnaires were administered to 100 members of the public. Convenience sampling was used for this study. According to Leedy (1997) convenience sampling method takes units as they arrive on the scene or as they are presented to the researcher by mere happenstance. It was appropriate for this study as there were limitations of time and money. Moisture content in the solid waste was tested. Fives samples from unsorted heaps of waste were collected from the skip, sanitary lanes, and the open spaces. The samples were analysed

for moisture. A known mass of waste was put in a well-cleaned and preheated crucible. This was then heated at 105 degrees Celcius until a constant mass was obtained. The difference between the original and final masses of the sample yielded the quantity of moisture lost. This was then expressed as a percentage of the original.

Results and discussions

During the time of the study the CBD was generally affected by littering as well as illegal dumping of waste. Places worst affected were the open spaces, alleys, surroundings of skips (transfer stations), market places, and some streets. The main forms of waste were organic materials (vegetables, fruits, food and kitchen refuse), plastics, non-returnable disposable food and drink containers, metal cans, and paper. The solid wastes found in the city centre are summarised in Table 1 below.

Table 1. Estimated waste quantities at different locations in the CBD

Type of waste	**Estimated quantity (%)**	**Location**
Organic materials	42	Greenmarket areas, alleys, transfer stations and open spaces.
Plastic papers	23	Open spaces, alleys and streets.
Non-retainable disposable food containers	14	Transfer stations, alleys and open spaces.
Sweepings	10	Streets, alleys and open spaces
Metal cans	3	Open spaces, transfer stations and alleys
Papers	5	Open spaces, transfer stations and alleys
Others	3	Open spaces, transfer stations and alleys
Total	**100**	

Source: Field survey

Transfer stations (skips)

The visit to the waste skips (transfer stations) revealed that organic waste constituted the greatest amount of waste. The skips were full and were over-spilling. Heaps of waste piled around the skips. The waste was composed of putrescent tomatoes, bananas, oranges and vegetables. The waste produced an offensive smell that covered a radius of 20 metres from the skips. Large swarms of flies and mosquitoes infested the area. Rats could be seen at the transfer stations during the evenings. The transfer stations were breeding places for these vectors of communicable diseases such as fever, dysentery, diarrhoea, and malaria. Green market stalls are approximately 20 metres from the skips. This puts them at high risk as flies can easily descend onto the vegetables and fruits being sold. The skip is also a potential health hazard to nearby residential suburbs.

According to Greenberg (1971) and Prickford (1983) both houseflies and mosquitoes fly a distance of up to 5 kilometres. They can be effective carriers of sanitation-related diseases such as cholera and malaria to residential suburbs such as Munhumutapa and Nashville, which, lie within 5 kilometres from these skips. They were also a potential health threat to commuters who use the bus terminus, which is less than 30 metres from the skips. Samples of waste from the skips were tested for moisture content. They had moisture content of 68 per cent. This promotes rotting and this in turn provides a conducive breeding place for flies.

Interviews with the cleaners showed that waste had not been collected for three weeks. Further interviews with the Cleansing Superintendent revealed that the municipal council was experiencing several challenges in collecting refuse from different parts of the city, including the CBD. Firstly, only one compactor (refuse truck) was functional. The refuse fleet was grounded due to lack of spare parts. During the time of the research Zimbabwe was having foreign currency and inflation problems. These made it difficult for the council to procure spares as most of them are imported. The council experienced fuel problems, as the country could not source adequate amounts due to lack of foreign currency.

Alleys (sanitary/service) lanes

During the time the study was carried out, a lot of solid waste was illegally dumped in most alleys in the CBD. The worst affected were those between Second and Third Streets, and between Sixth and Seventh Streets. Uncollected bins with waste spilling over, characterized these alleys. Shops and a variety of business enterprises illegally dumped waste in the alleys. This was in the form of cardboard papers, plastic papers, sweepings, and human hair from salons, food residues from food outlets in the CBD, domestic waste, ash, and disposable plastic containers. A sample

of waste was tested for moisture and it was at 36 percent. This encouraged the breeding of flies as maggots were observed in the waste.

Some people were observed relieved themselves in the alleys. The alleys were impassable due to heavy stench from urine. It was also observed that the uncollected bins and the illegally dumped waste were conducive to the breeding of disease vectors such as flies, rats, mosquitoes and cockroaches. During routine visits to the alleys these vectors were noticed. They pose a threat to the health of the people as well as compromise the aesthetic values of the CBD.

Some street kids scavenge for food from bins in the alley. This exposes them to diseases. Street kids and vagrants burnt waste to warm themselves at night. Some residents also burnt waste as a way of managing it. This produced smoke that caused air pollution and has the potential to contribute to temperature change.

From the questionnaires, 95 per cent of the respondents said that the unavailability of public toilets led to the use of alleys by vagrants as well as some members of the public. During interviews, it was also argued that fines for urinating or defecating in public were a mere $15 000. This was not deterrent at all. Some interviewees also expressed the opinion that some individuals had become morally decadent. Hence they saw nothing wrong in soiling the environment.

The issue of legislation is difficult to deal with especially in municipal councils. Chenje (2000) argues that there are several legislations dealing with solid wastes. However, the problem is the enforcement of the legislation. Tevera et al (2002) contend that the fragmentation of government institutions tasked with enforcing legislation on solid waste management does not encourage sound environmental management. Different government ministries, such as, Ministry of Environment and Tourism, Ministry of Local Government and National Housing, Ministry of Education and Culture, Ministry of Higher Education and Technology, and Ministry of Health and Child Welfare had environmental provisions which were rigid and sector based. For instance the Public Health Act is under Ministry of Health and Child Welfare whilst the Natural Resources Act is under the jurisdiction of Ministry of Environment and Tourism. As a result, the management of solid waste lacks uniformity and coordination of areas of responsibility. For example, the municipal police do not have the capacity to enforce the legislation. They should be given arresting powers so as to be able to enforce the Environmental Act. A closer analysis of the byelaws shows that fines imposed by the council for environmental offences were not sufficiently punitive. The byelaws were set in 1982 and revised in 1987. Since then no amendment was ever

done yet inflation has been spiraling and in March 2007 it was above 1700 % (CSO, 2007). Table 2 shows some of the byelaws and fines.

Table 2: Extracts of Gweru City Health Byelaws

Bye-law	**Fine in Z$**
1. Allowing a sanitary convenience to become contaminated or to become a nuisance	25 000
2. Urinating or defacating in public.	15 000
3. Occupiers of premises who deposit refuse or rubbish, store sweepings on premises	25 000
4. Depositing rubbish or littering in any public places or undeveloped land	25 000
5. Burning offensive matter on any premises	15 000

Source: Extracted from Gweru (Public Health) Bye laws, Statutory Instrument 12/82 Section 28

Open spaces

Open spaces in the CBD were littered with plastic papers. These were sampled and it was realised that they were made of very thin material and lacked durability. Even though supermarkets charge a price for the bags, these continue to be dumped or disposed of recklessly. Domestic wastes were also being dumped in the open space. This was done during the night, as residents knew very well that it was an offence to do so. The residents revealed during interviews that they knew the practice was illegal but had no option. Of the respondents, 54 per cent were aware of the byelaw, which prohibited them from dumping waste in undeveloped land (see Table 2). They argued that bins were being collected infrequently. They could not keep waste at their doorstep. It was apparent that failure by the council to collect waste from residence in the CBD encourages illegal dumping. From the questionnaires, 67 per cent of the respondents admitted it was wrong to dump waste in the open spaces but argued that residents had no option. The Cleansing Superintendent admitted that open spaces contained a lot of litter and waste dumped by residence. He argued that the situation was compounded by the fact that some spaces were fenced. The council could not access these premises, as they could not trespass. The Cleansing Superintendent further pointed out that, over the years, solid waste, particularly plastics, had caused blockage of drainage pipes during the rainy seasons. This resulted in flooding of streets and pavements. Flooding restricted transport flow and this could cause accidents. The Cleansing Superintendent highlighted that the council had in the past incurred heavy costs in trying to unchoke drainage pipes clogged with litter. He also revealed that flooding resulted in dirty water joining the water systems supplying the city. The city had in the past spent large sums

of money to purify such type of water. The Cleansing Superintendent said the council passed on such expenses to the ratepayers. Poor handling of solid waste was therefore expensive even to the one individual who deliberately discarded litter in the CBD. From the questionnaires, it was clear that a significant percentage did not know that the dirty water would join the city's water supply system. As many as 44 per cent said they did not know that.

Street and avenues

During the time of the study, a number of streets in the CBD had litter and sweepings on their verges. Some streets had plastics, disposable food containers, peels from fruits and maize cobs, till slips and cell-phone top-up cards. It was observed that busy streets such as Robert Mugabe Way (area around OK supermarket) and Fifth Street (around TM supermarket) were full of vendors who sold fruits, maize cobs, ground nuts and top-up cards. Mbande (1997) contends that the collapse of the rural economy and rapid urbanization of poor people contribute to a breakdown of traditional methods of waste management in urban areas. Gweru City is no exception. Vendors heavily congested these streets. There had been a marked increase in the number of people in the CBD. This had not been accompanied by a concomitant increase in the number of waste receptacles. The CBD did not have adequate bins. It had 160 bins, which were found at street corners. The ideal situation was to have a bin every 20 metres. All the respondents (100 %) said that the number of litterbins was inadequate. Those interviewed said it was inconvenient for people to carry waste for a long distance. Hence the tendency was to drop the waste. Some argued that shop owners could provide bins in front of their premises as Chicken Inn, Pizza Inn and Bakers Inn have done. Despite being frequented by many people, their area remained very clean.

It was also observed that, poor attitude by members of the public contributed to littering. Consumers simply threw away litter from moving vehicles. Others just dropped litter onto the ground. From the questionnaires 15 per cent said there was nothing wrong as cleaners were employed to do the job. Forty-three per cent said they at times dropped litter without realizing it. According to Tevera (1994) the 'throw away' attitude, which is common in the western world, has caught up with people in Zimbabwe.

It was also observed that commuters on mini-buses also contributed a lot of waste onto the streets. They threw away litter, as mini-buses do not have litterbags on them. A spot check on 21 commuter taxis at TM supermarket rank and 16 at Wimpy rank revealed that not even one of them had a litterbag. This means commuters were forced to throw litter out of the windows thereby polluting the environment. Some long distance buses had notices that instructed passengers to throw litter out. In this regard, commuters were contributing to littering in the CBD

environs. However, the council did not have enough manpower to clean the streets. It reduced its entire workforce as a result of the Economic Structural Adjustment Programme (ESAP). It employed 41 women. It was observed that these women tended to burn sweepings and any waste on the road verges. This was in contravention of the city's byelaws as can be seen in Table 2. For burning offensive matter on any premises one paid a fine of $15 000. When asked why they burnt waste they said they did not have pushcarts to carry the waste to the transfer station. It was, therefore, convenient for them to burn the waste. This results in the production of carbon dioxide, which is a greenhouse gas. According to UNEP (1999) the emission of greenhouse gases contributes to global warming, with a temperature rise of between 1.0 to 3.5 degrees Celcius by year 2100.

Conclusions

The following conclusions were made after completing this study:

During the time of the study solid waste management practices in the CBD were poor. The council was battling with problems of inadequate human, material and financial resources. Inflation and lack of foreign currency meant that waste could not be collected timeously. This exposed the public to potential health threats from the waste.

There was lack of complementary action from different stakeholders in waste management. The whole business of waste management was left to the municipal council alone. Their police force was left to deal with people who disposed of waste recklessly, like vendors yet they do not have arresting powers. The Zimbabwe Republic Police seemed to be on lookers and yet they have the powers to arrest offenders. Fines for various offences on waste were not deterrent at all. The public lacked an element of responsibility when dealing with the environment. They carelessly discard waste. The corporate world (shops, banks etc) did not provide bins at their premises. This means the different stakeholders mentioned above contributed to the occurrence of litter on the streets.

There was a lot of unnecessary packaging of items bought from shops. The plastics were thin; hence they were not durable. They broke easily and they ended up being discarded into the environment. Although plastics did not pose a direct health threat to people they compromised the aesthetic value of the City of Gweru.

During the time the study was carried out, very little attention was being given to organic waste, yet it was a potential health hazard. Reckless handling of this waste could lead to the spread of epidemics such as cholera , dysentery and diarrhoea.

Recommendations

Community education and awareness campaigns

The Gweru community must be exposed to environmental education through awareness campaigns. The community must be involved in the environmental programmes. They need to own the programme. Gweru City should use the bottom-up approach instead of the top-down approach in waste management. Educational messages could be attached on water bills to enable ratepayers to read for themselves. The public should be educated to participate in recycling and re-use. They should not be after the remuneration they earn after selling the recovered waste. The idea is to have a cleaner environment. In order to achieve sustainable waste management, individuals must be encouraged to reduce waste at source so that what goes into the bins is true waste.

Participation of the business community in waste management

The business community in the CBD must provide bins at their premises. They could advertise on these. They could take a cue from how Chicken Inn, Pizza Inn and Bakers Inn are doing it. They should also provide more durable plastic bags, which can be re-used for other purposes. Shops should reduce the amount of packaging. This promotes sustainable waste management.

Revamping refuse collection and waste disposal

Bins with tightly fitting lids to exclude flies, must be used in the CBD. Fixed concrete bins should be provided in the CBD. This will reduce vandalism and thefts of bins. Waste should be collected on a regular basis to avert the problems of pandemics such as cholera. The street cleaners and the council should be encouraged to make compost from sweepings instead of burning them. This is more sustainable as the compost will be used in flowerbeds.

Closing of alleys and provision of public toilets

Alleys need to be closed to the public. However, this provides a big challenge to the users. Sanitary lanes in Zimbabwe's cities are used as service lanes. It would therefore be necessary to identify the users of these facilities then arrange how they could be operated. This should be accompanied by the provision of public and pay toilets in the CBD. This will reduce the number of people who want to use the sanitary lanes to relieve themselves.

Institutional and legislative issues

Local authorities must be capacitated in enforcing legislation. They must be endowed with arresting powers. Fines for environmental offences must be realistic and deterrent. They should be in tandem with prevailing inflation rates. The bureaucracy in the setting of byelaws and approving deposit fines must be removed.

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