US-China Education Review B 4 (2011) 558-567
Earlier title: US-China Education Review, ISSN 1548-6613

The Role of Urban Primary and Secondary Schools in Minimizing Disease Outbreak Caused by Environmental Contamination: A Case of Chinhoyi, Zimbabwe

Edlight Mutungwe, Maria Tsvere, Beauty Dondo, Simbarashe Munikwa
Chinhoyi University of Technology, Chinhoyi, Zimbabwe

Waste management is a major challenge facing urban councils in Zimbabwe and Chinhoyi Municipality is no exception. Lack of resources and technical and administrative know-how is hindering proper waste management. Raw sewage and industrial waste flow into streams and rivers and uncollected rubbish bins and strewn litter is a common feature in the municipal area. The city has had serious cholera outbreaks that affected adults, school children and children before school age. The primary school environmental studies syllabus and the secondary school health education syllabus have been in place, but preliminary findings indicate that these syllabi do not equip learners with knowledge and skills to combat the outbreak of diseases like cholera. The Department of Curriculum and Instruction sought to establish the role that schools play in minimizing disease outbreaks in their environments through environmental studies and health education. The case study included three primary schools and three secondary schools under the Chinhoyi Municipality. Data were collected using observation guides, questionnaires for secondary pupils and teachers, excursions, documents and interviews with primary school pupils, school heads, health inspectors and municipality officials. The data were then presented qualitatively aided by graphs and pie charts. The study indicated that school pupils were not active in waste management in the urban areas. It was also found that teachers were not making any reference to disease outbreaks during lessons on environmental studies. The teacher education programme should include a course on waste management, so as to develop in learners a positive attitude towards proper waste disposal behavior.

Keywords: waste management, environmental contamination, disease control

Introduction

Dumping of waste is a common practice everywhere in Zimbabwe and schools are no exception. Waste management is a major challenge facing urban councils in Zimbabwe and Chinhoyi Municipality has a mammoth task to meet environmental requirements in this regard. Of all environmental problems that have come into focus in Gweru, institutional solid waste management has been the slowest to develop in either direction or regulatory mechanisms (Jeri, 2006). In Chinhoyi, all forms of waste management seem not to have a regulatory mechanism (paper, raw sewerage and solid waste). Although laws for managing waste are in

Edlight Mutungwe, lecturer, Department of Curriculum and Instruction, Chinhoyi University of Technology.
Maria Tsvere, lecturer, Department of Curriculum and Instruction, Chinhoyi University of Technology.
Beauty Dondo, lecturer, the Department of Curriculum and Instruction, Chinhoyi University of Technology.
Simbarashe Munikwa, lecturer, Department of Curriculum and Instruction, Chinhoyi University of Technology.

existence, they are not implemented. Foul smell and smoke linger around residential areas, raw sewage and industrial waste are being disposed into streams and rivers, undesignated dumping sites along streets and school fences are a cause for concern. The city has had cholera outbreaks since 2008 affecting adults, school children and children before school age. In this situation, the education sector appears not to have been actively involved in minimizing the outbreak of the diseases or improving waste management. It is evident that the school curriculum in both primary and secondary school comprises of subjects that have health related topics. Environmental science for primary school is an integrated subject which seeks to make pupils aware of themselves and the physical environment around them. Guidance and counseling syllabi for form one to six have topics that are meant to conscientize students on promotion of health and taking care of the environment. The invisible nature of the schools in waste management prompted by this research with an attempt to establish the role that schools play in waste disposal and minimization of disease outbreaks.

Literature Review

The past five years have been very challenging on local authorities' management systems. The challenges were a result of the unstable political situation in the country. Proceedings of the Emerging Issues in Urban Waste Management Workshop organized by Practical Action Newlands, Harare, on February 10, 2006, observed that there had been a deterioration of service delivery, such as water and sewerage reticulation systems, roads and refuse removal and equipment. Waste management is one of the most pressing challenges facing urban councils throughout Zimbabwe. Currently, more than 2.5 tones of household and industrial waste are produced per annum in urban areas, and this continues to raise annually in the absence of waste management strategies (Practical Action, 2006).

Throughout Zimbabwe, urban waste collection rates have dropped from at least 80% (mid-1990s) of the waste generated to as low as 30% in some large cities and small towns. Areas which are worst affected by erratic waste collection are low income residential areas, such as Mbare in Harare, which receive no formal waste collection services at all, and this is alluded to by Tevera et al. cited in Practical Action (2006). The same is observed in high density areas under the Chinhoyi Municipality where piles of dirt are seen along streets, school fences and raw sewerage/blockages left unattended for days or weeks on end. Residents resort to creating their own dump sites in the streets after council fails to collect refuse. The low waste collection levels and rudimentary disposal methods employed are a cause for concern because they trigger widespread illegal open dumping and rampant waste burning which threaten public health and pollute the environment (Practical Action, 2005).

In an effort to minimize environmental degradation, Zimbabwe has implemented the following measures:

(1) Draft Waste Management Strategy (2006) aimed to improve the cleanliness and restore the glamour of Zimbabwe by promoting sustainable waste management practices in all areas in the country. The strategy identifies all problem areas that make the environment dirty and unsightly, including littering, illegal and improper dumping/disposal of waste, vending, sewage problems, air pollution and overgrown vegetation on roadsides. The strategy proposes an action plan involving all stakeholders for solving these problems. This strategy in this research triggered some ways as the researchers observed that the education sector was a stakeholder and was taking a backseat in solving this societal problem;

(2) The Science and Technology Policy (2002) acknowledged that pollution of the country's environment is increasing and requires urgent attention. The policy singles out industrial waste as an adverse effect on the

environment and encourages the adoption of cleaner production technologies as a solution;

(3) The Draft National Environmental Policy (2003) emphasized that a clean and healthy environment is the right for every Zimbabwean. It calls for development of an integrated waste management strategy to address the growing problem of waste.

Through its interventions and working with communities in waste management, Environment Africa identified the following challenges inhibiting proper waste management: lack of community awareness of environmental rights as provided in legislation; lack of access to information on environmental information, poverty resulting in waste management being lowly prioritized; lack of adequate resources to expand and initiate new projects, negative attitude by communities as well as poor or non-enforcement of laws. These challenges are not only peculiar to the area of study, in which environment Africa visited, but are quite applicable to this research.

Waste generation rates in low and middle income countries reflect their socio-economic development, urbanization and industrialization. In general, urban population produces two to three times more than rural population per capita and year, according to Hogland, Visvanathan, Marques, and Manahdhar (2005). This may imply that Zimbabwe is in the category where more waste is generated in urban centers, hence need to call for all stakeholders including schools to work together in enforcing proper waste disposal practices. Significant amount of horticultural waste is generated in schools and adopting the nearest open site for dumping waste has been the easiest means of managing the waste. Canteen and vendors are also major contributors of waste in schools. Here, a good amount of plastic disposables are thrown with the leftover food, which makes resource recovery difficult. While giving a wrong notion of waste management to the students, it also increases the problem of waste. Apart from the biodegradable paper and plastic wastes, e-wastes like tube lights, bulbs, paint containers, etc., are found in the waste bins from schools as noted by Hogland and Marques (2002). Therefore, it has become indeed very essential for educational places to look into the matter and participate in the move for sustainable waste management. Schools are known for their enthusiasm in adopting various educational programmes and moving in tandem with the current wave to protect environment, these educational places are also trying to contribute their best. Few schools have set examples by initiating waste management system within their premises.

Aim of the Study

The study sought to establish the role of the school in minimizing diseases caused by environmental waste in urban areas.

Research Questions

The research questions are as follows:

(1) What is the role of the school in inculcating proper waste management behavior among pupils and communities?

(2) How is the school teaching on waste management being translated into practice?

(3) How can the teaching of waste management be strengthened to minimize disease outbreak in urban areas?

Methodology

Chinhoyi urban has eight primary schools and four secondary schools that are catered for refusing

collection by the city council. Of these, two are under Chinhoyi Municipality, two are private schools and seven are government schools with a total enrollment of 6,803 boys and 6,948 girls in the primary schools pupils and 3,622 boys and 3,729 girls in the secondary school pupils. The sample comprised 195 school pupils, 74 teachers, one environmental health officer from Chinhoyi Municipality, one environmental health management officer from EMA (Environmental Management Agency), one health officer from the MoHCW (Ministry of Health and Child Welfare) and one education specialist for the MoESAC (Ministry of Education Sport Arts and Culture). Simple random selection method using the "pick a name" technique was used to select six (three primary and three secondary) schools. The same technique was used to select the classes that provided the researchers with subjects. All selected pupils presenting in classes comprised the study pupil sample for each school (n = 124 primary, n = 71 secondary). Teachers who responded to the research instruments were selected using the census method of sampling (n = 46 primary, n = 28 secondary).

Instruments

Survey research instruments comprised interview guides, FGD (focus group discussion) guide, questionnaires and observation guides. The teachers' questionnaires sought to establish aspects of school curriculum on waste management, awareness of waste disposal practices, the role played by the school in minimizing disease outbreaks and what schools could do to improve waste management in urban centers. Pupils' questionnaires were in three parts. The first part of the questionnaires focused on environmental awareness top checking how much children were aware of disease outbreaks and their links to environmental waste management. The second part looked at how much content children learnt on disease prevention and waste management. The last sections asked questions that responded to issues of how pupils translated in class learning to practice. The teachers' questionnaires comprise three sections, i.e., curriculum content, curriculum implementation and needs assessment. Focus group discussion guides were similar to questionnaires, but these were mainly used to augment data from questionnaires. The questionnaires were pilot tested with one class and ten teachers. They were also sent to the Ministry of Education regional office for approval. The process helped to ensure the reliability and validity of the instrument.

Data Collection Procedure

Physical access to schools was obtained in two ways. Firstly, permission was sought from the MoESAC to carry out the research. After that, telephone requests were made to school heads for permission to visit the selected schools. Cognitive access was made through introductory remarks by school heads to teachers and pupils. Mixed methods of data collection were employed having noted strengths and weaknesses of the instruments that were appropriate for this study. The data were collected using questionnaires, observation and interview guides and excursions and document analysis. Primary data were collected through questionnaires from pupils and teachers. Observations, FGD and interviews were held to verify questionnaires findings. Ethical considerations were strictly adhered to by the researchers. Face to face interviews were then conducted with relevant officials to get insight into how the Chinhoyi Municipality, the EMA and the Ministry of Health were working together with the schools on waste management. Documentary analysis provided information on school curriculum, subject content and what had been taught (schemes of work and progress records).

Data Presentation

The data were presented qualitatively aided by graphs, pie charts and photos.

Presentation of Findings

The findings presented are from data collected using questionnaires, interview, observation and FGD guides as well as the document analysis. Table 1 shows the distribution of respondents according to level and gender, and Table 2 shows teachers' questionaires.

Table 1

Distribution of Respondents According to Level and Gender (n = 195 Pupils, 74 Teachers (269))

Group of respondents			
	Gender	*No.*	Percentage (%)
Pupils-primary	Females	67	34.4
	Males	57	29.2
Secondary school pupils	Females	44	22.6
	Males	27	13.8
Total No. of pupils		195	100
Teachers-primary	Females	32	43.2
	Males	14	18.9
Teachers-secondary	Females	20	27.0
	Males	8	10.8
Total No. of teachers		74	100

Note. The role of the school in inculcating proper waste management behavior among pupils and communities.

Table 2

Teachers' Questionnaires (n = 74)

What is being done			What was done during cholera outbreak			What can be done		
	No.	Percentage (%)		*No.*	Percentage (%)		*No.*	Percentage (%)
Teaching pupils to wash hands after visiting the toilet and before handling food	74	100	Emphasizing on hygienic habits e.g., washing hands, fruits and vegetables	74	100	Providing bins in each class and more bins around school premises	35	47.3
Teaching pupils to sweep and put litter in bins	74	100	Supplying clean treated water	74	100	Having common site for dump collection	20	27.0
Teaching pupils to burn litter	60	81.1	School played no role	4	5.4	Reminding pupils of good health habits	48	64.9
Providing bins	30	40.5	Giving pupils information on cholera	65	87.8	Information dissemination or awareness campaigns using drama, poetry, etc.	62	83.8
Teaching on types of diseases	74	100				Involving pupils in taking care of waste disposal	36	48.6
						Competitions on cleanliness of the environment	23	31.1
						Engaging industry in waste disposal e.g., paper manufacturers, environmentalists and business community	12	16.2

(Table 2 continued)

						Serious teaching of health issues under guidance and counseling and environmental science	49	66.2
						Teacher training to equip teachers fully on environmental management	58	78.4

From the questionnaire, findings showed that the teaching in both primary and secondary schools centered on hygiene, picking litter, sweeping and teaching types of diseases and theory on preventing the spread of contaminable diseases. Focus group discussions revealed that pupils knew contaminable diseases, as they cited dysentery, typhoid, diarrhea and cholera without hesitation. However, understanding of causes, prevention and what was actually being done by the school pupils, their teachers and administration to minimize disease outbreak were minimal. Hygienic practices carried out were washing hands after using the toilet, sweeping classrooms and picking litter in school premise. Pupils and staff members agreed that not enough was being done in the schools in promoting proper waste disposal practices. Four teachers admitted that the teaching of health topics in environmental science (primary school) and guidance and counseling (in secondary school) was not effectively done and called on heads of schools to supervise the teaching of these subjects. Speaking to the education officer on this issue, the officer alluded to the fact that teachers were not doing justice to this section and the officer planned to embark on school supervision to enforce teaching of these subject areas not only theoretically, but also practical results were required.

Table 3 revealed that in theory, pupils are taught mainly personal hygiene and keeping the school yard clean (75.8%), especially the primary school pupils and disease outbreak due to poor waste disposal systems (77.9%). Although teachers confirmed that school pupils were involved in waste management (see Figures 1 and 2), such as sweeping classrooms, it was found that only primary school teachers were consistent in monitoring the cleaning (85.7%), while secondary school teachers did not really monitor this aspect (68.8%).

Table 3

Pupils' Questionnaire Findings, on the Role of the School (n = 195)

Role played by the school(s)	*No.*	Percentage (%)
School plays no role, no teaching on waste management	37	18.9
Teaches hygienic habits—washing hands after use of toilet, before handling food, sweeping and cleaning toilets, to be smart	148	75.8
Diseases spread due to waste disposal	152	77.9
Referring sick students to hospital	38	19.4
Taught to pick litter and not to throw litter everywhere	160	82
Teachers don't care about the environment	86	44.1
What they teach is not what they/we do	129	66.1
No response	36	18.4

This result was confirmed by 44.1% of the pupils who argued that teachers did not practice what they taught and 18.9% of the pupils who also argued that teachers were not teaching them on waste management. FGD revealed that the teaching of disease outbreaks came after the cholera pandemic and most pupils were very knowledgeable on cholera but a few on other contaminable diseases. It is saddening to note that 18.9% of

the pupils alleged that schools are doing nothing about waste disposal and disease outbreaks, 66.1% of the pupils said that what is taught is not what they and their teachers do while 18.4% of pupils failed to give a response on this issue. Interviewing with officials from Chinhoyi Municipality, the Environmental Health Management Agency and the Ministry of Health indicated that they had no programmes related to waste management with schools. Observations in some schools dropped litter at school entrance, refuse dump sites along school durawalls and in the school yard (see Figure 3). Most of the litter in sight is from food outlets, as observed by OECD (2002). Bins in the classrooms were not common in the six schools visited except for two, and no bins is sight around school grounds, even the girls toilets which were sanitary bins were expected. It is indicated that little was done to enable learners to put into practice the theory learnt.

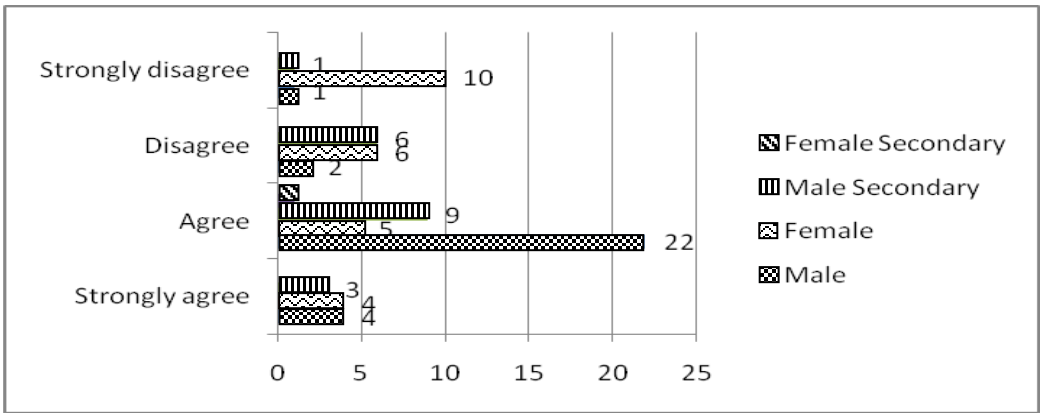

Figure 1. Toilets are kept satisfactorily clean.

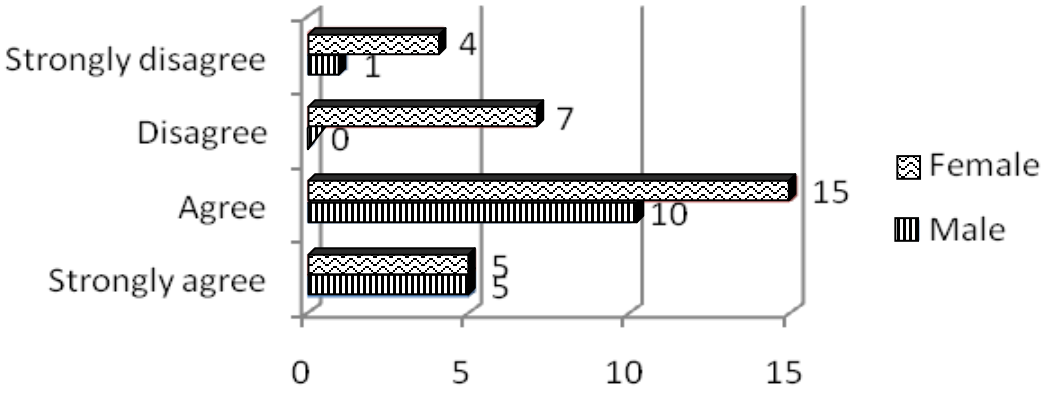

Figure 2. Pupils empty waste bins.

Teachers were asked on their knowledge of policies put in place by government to help alleviate the problem of waste and environmental pollution and 89.8% of them were not aware of the policies though they knew that they were in place. Four percent of those who responded fairly well identified the science and technology policy and the remaining 6% cited the national environmental policy. Further probing showed that the 6% were geography teachers and environmental teachers, some working with EMA on environmental awareness issues (in a low scale). Chinhoyi Municipality explained that they did not work with schools in educating pupils or the community, but had recently embarked on a clean-up operation throughout the residential areas including schools. A health official in the town council explained that they had started an inspection of schools with the aim of a competition for the cleanest school coming up in July 2010. If this

succeeds, then it would be the beginning of involving schools in waste management.

How Is the School Teaching on Waste Management Translated Into Practice?

Questionnaire findings revealed (as shown in Table 2) that very little of what is being taught has translated into practice. Document analysis showed that environmental science aims to develop an appreciation of a well managed environment, develop a positive interest in the environment. The objectives expect pupils to apply concepts and skills to improve and manage the environment. None of these aspects was given or shown by the pupils, teachers and officials or observed by the researchers. No school indicated involvement in any environmental awareness activity, club or action.

Figure 3 was taken at one of the schools and clearly showed that what was taught is not practiced.

Figure 3. A picture showing the practice of schools.

The secondary school guidance and counseling syllabi is not being implemented at all and has environmental issues to be addressed. Teachers indicated that health issues are included in various school subjects: physical education (n = 5), HIV/AIDS (Human Immune-virus/Acquired Immune Deficiency Syndrome) education (n = 26), home economics (n = 4), environmental science (n = 33) and social studies (n = 7). The study however found that teachers were aware that their specific subjects contained issues on environmental waste management: HIV/AIDS education (n = 13); health and safety (27); environmental science (n = 4); and home economics (n = 5). Students noted that they were not being taught waste management (18.9%). Teachers, however, expressed the need to be staff developed on waste management (n = 42). Areas of special need mentioned included proper waste disposal (n = 43); types of diseases related to poor waste disposal practices (n = 23); and disaster preparedness including warning signs of a disaster outbreak (n = 11). Teachers actually needed this aspect of training when they noted that environmental waste management should be mainstreamed into the present subjects (n = 30) and during assemblies by school head (n = 15).

Observations revealed high standards of hygiene being observed at two schools that containers of hand washing water are strategically positioned for pupils and coming from the toilets to wash hands. This was

highly commendable. Toilets were fairly adequate at the schools, unfortunately, water is a problem but efforts are made to store water for flashing toilets. Teaching of this aspect is theory and this makes matter abstract. Teachers revealed that they were not very conversant with waste management theories, but hygiene issues were not a problem. Lecturing such areas is not effective as compared to participatory methodologies, where learners have hands on and do the planning of their activities in waste management. The fact that some students noted that teachers do not practice what they have taught (see Table 2) is an indicator that little of what was taught is practised.

Although there were mixed opinions about how the schools were putting into practice what they taught, they were conscious of the need for adequate toilet facilities (see Figure 4). Some teachers felt that the toilets in the schools were not adequate (n = 36). Observations by researchers noted that each school had some toilets but there was no effort to look at gender population and other aspects of the toilet facilities.

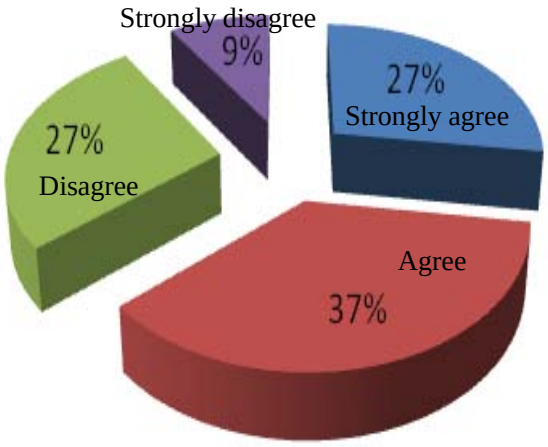

Figure 4. The school has adequate toilets.

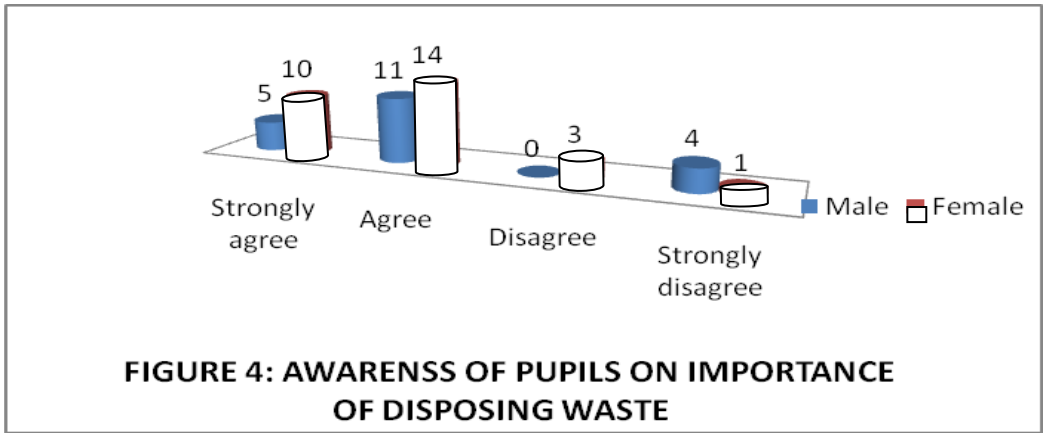

Figure 5. Awareness of pupils on importance of disposing waste.

Teachers confirmed in theory that pupils were aware of what to do with waste (see Figure 5). Teachers themselves were also aware of how to deal with waste, such as broken glasses which they (74.3%) said that they would dig a pit and through the bottles. Teachers, however, were of the opinion that broken furniture should be stored by some who felt that they should be kept under sheds (31.1%) or storerooms (20.3%), or burn it as fuel. Some believed that broken furniture should be repaired (0.08%), while the majority said that they

would burn waste paper (93%).

Recommendations

The study strongly recommends staff development or in-servicing of teachers, so that they acquire in-depth knowledge, teaching methodologies and skills in environmental issues, especially on waste management and disease control so as to transfer the knowledge and skills to pupils and communities in which they work. Workshops to conscientize educators on environmental policies, waste disposal strategies and clubs can be initiated in their schools, communities and organizations at their disposal for assistance and guidance on such matters. For example, schools need to spearhead formation of waste disposal clubs and clusters with the assistance of officials in the Ministry of Health, Municipal Council and those from the EMA. This helps communities to own the projects or clubs, hence changes mind sets of leaving waste disposal as someone else's responsibility. There is need for schools to use chemicals to clean toilets so as to prevent breeding of flies and other micro-organisms, strategically position bins around the school premises preferably, which should be opened at the top for easy throwing in of litter. Some people find it taxing to lift bin lids resulting in them throwing litter around the bin and not in the bin. Each classroom should have a bin.

References

Jeri, S. (2006). Analysis of institutional solid waste management in Gweru, Zimbabwe. *Eastern Africa Social Science Research Review, 22*(1), 103-125.

Hogland, W., Visvanathan, C., Marques, M., & Manahdhar, D. R. (2005). Filling the waste management gap: Landfill management in low-and medium income countries in Asia. In *The waste management world* (pp. 87-96).

Hogland, W., & Marques, M. (2007). Sustainable waste management: International perspectives. Proceedings of the *International Conference on Sustainable Solid Waste Management* (pp. 1-8), September 5-7, 2007, Chennai, India.

Southern Africa. (2006). *Proceedings of the Emerging Issues in Urban Waste Management Workshop*. Harare: Practical Action Southern Africa.