Chapter 2

Municipal Solid Waste Management

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ABSTRACT

The rapid increase in urban population has resulted in poor environmental conditions in urban and peri-urban settlements. In most developing countries, the problem of inefficient municipal solid waste management (MSWM) is endemic. The problem manifests in heaps of uncollected solid waste or ubiquitous illegal dumps on open areas and by the street sides. This paper examines issues of solid waste management practices in the City of Kwekwe in Zimbabwe. It highlights types of waste, its generation, transfer and disposal. A mixed methodological approach including field observations, structured questionnaire survey and face-to-face interviews were employed in the gathering of data for the study. The key findings established to be the factors affecting effective solid waste management in the City are irregular solid waste collection, inadequate operational funding, inappropriate technologies, inadequate staffing, lack of knowledge cooperation and knowledge on the part of the residents. Based on the research findings, principles of environmental stewardship need to be promoted in the City.

INTRODUCTION

Land pollution and solid waste generation have become major issues in cities of less economically developed countries (Abdelnaser & Gavrilescu, 2008). The possible causes of land pollution include rising standards of living, technological development, growing populations, increase in income per capita income. Solid waste comes from domestic, social institutional and industrial activities (UNEP, 2005; Babanawo, 2006). Most of the municipal solid waste (MSW) is dumped on land in a more or less

uncontrolled manner. These dumps make use of the available space very uneconomical, allow free access to waste pickers, animals and flies and often produce unpleasant and hazardous smoke from slow-burning fires (Zurbrugg, 2002; Cointreau, 2005; 2006). Solid waste, garbage, trash, refuse or rubbish is non-flowing organic wastes (combustibles wastes, plastic, wood, paper, textile, leather and rubber) and inorganic materials wastes (non-combustibles wastes, ferrous metal material, non-ferrous materials, glass, stone, ceramic, bones and shells).

Solid waste management (SWM) has become an integral part of the urban environment to ensure safe and health human while considering the promotion of sustainable economic growth technology. Waste management can be used to describe several distinct processes: the elimination or reduction of waste; the recycling or reuse of waste material; the treatment or destruction of waste (physically destroying, chemically detoxifying, or otherwise rendering waste permanently harmless); and disposal of waste into the air, water, or land (Adewale, 2011). Solid waste management systems operate at the political, socio-cultural, economic and environmental levels.

Five aspects of waste management range from generation, storage, collection, transportation through to the disposal of waste (UNEP, 2005; Hoornweg & Perinaz, 2012). Solid waste generation is an inevitable consequence of production and consumption activities in any economy (UNEP, 2005; Fei-Baffoe, Nyankson & Gorkeh-Miah, 2014).). Waste generators comprise households, industries, hospitals, and commercial and administrative establishments. The amount and type of waste generated is greatly influenced by geographical and socio-economic factors. These factors include; household size, household age structure, household income, type of dwelling, geographical location and time of year, geographical location, season of the year, population and the mean living standards waste collection frequency and the characteristics of the source area (Rushbrook & Pugh, 1999; Anschiitz & van de Klundert, 2000; Babanawo, 2006).

The volume of global solid waste generation is expected to increase with increasing global population. Improvement in standard of living across the global is expected to contribute its quota not only to the global waste volume but also its complexity. Globalization of the world economy is expected to have the same effect on solid waste as improvements in standards of living across the globe. Countries like Zimbabwe can easily become dumping sites for waste materials in form of outdated computers donated by richer countries and second-hand cars. This contributes to land pollution in residential areas and open spaces.

Geographic and physical factors include; geographic location, season of the year, the use of kitchen waste food grinders, waste collection frequency and the characteristics of service areas. The World Bank (1992) notes that waste generation tends to increase with increase in population and economic growth. High-income countries produce about three times more municipal waste per capita than the developing countries (Cointreau, 2005; 2006). Areas with high income groups generate higher amount of waste per household than in areas with low income social groups.

Collection is by far the largest cost element in most MSWM systems. It accounts for 60-70% of costs in industrialized countries, and 70-90% of costs in developing and transition countries. There are many different collection systems that can be employed and these include simple emptying method, exchange method, one-way method, non-systematic collection, vacuum waste collection and scavenger force.

Four major ways of solid waste disposal composting, incineration, land filling and recycling (Adawale, 2011; Tchobanoglous, Thiesen & Higil, 1993). It is essential that storage facilities be as far as possible, animal proof, insect proof and weather proof, waste able and robust enough to reduce the transmission of diseases from the bins to people and breeding of mosquitoes in the nearby storage facilities.

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