

## The role of informal sector solid waste management practices to climate change abatement: A focus on harare and mutare, Zimbabwe.

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### Abstract

The aim of this study was to examine the impact of waste management practices in the informal sector on climate change in Zimbabwe with particular reference to the cities of Harare and Mutare. A multi-methods research design that triangulates quantitative and qualitative approaches was employed. A multi-methods research design that triangulates quantitative and qualitative approaches were employed. In Harare and Mutare, the city councils are experiencing major problems in collecting and minimizing the huge amounts of waste that could otherwise have negative impacts on local climate. Analysis of results gathered from the study, therefore, highlighted (a) the lack of recognition of the crucial role that could be played by the enterprises in reducing the amount of waste; and (b) the low rates of resource recovery and recycling in the enterprises which are vital waste minimization strategies as postulated in the principles of industrial ecology. Field investigations in the informal sector enterprises of Harare and Mutare indicated that waste minimization practices such as re-use and recycling are essential in reducing the impact of greenhouse gases on the environment. Governments of cities in African countries could be assisted in appreciating the value of informal sector solid waste management. The role of the informal sector recycling in climate change abatement should therefore not be underestimated in developing countries. All in all, in order to reduce greenhouse gas emissions from solid waste, conventional solid waste management needs to be replaced by resource management.

Greenhouse gases are generated from waste management practices and their impact on climate is influenced by the net greenhouse gases indirectly through downstream greenhouse savings. It is difficult to determine the actual impact as a result of the scarcity of data on the amounts of waste generated and its composition. Gaps exist in knowledge on the climatic impact of solid waste in developing countries and more-so with regard to informal sector enterprises. The studies need to be extended to the impact of waste that includes products imported by developing countries for a wider scope of the impact of solid waste management practices in the informal sector enterprises. In the study, the major aim is to examine the potential benefits that can be obtained from the management of solid waste that is generated in the informal sector from the various economic activities that are undertaken on climate change abatement. The study thus focuses on the cities of Harare and Mutare in Harare that have been experiencing severe challenges in collecting,

recycling, treating and disposing of the huge quantities of waste generated which could have impacts on the local climate. A number of safety, health, and environmental benefits could result from the effective management of waste because of the reduction in the generation of greenhouse gases. These include better quality of life, improved public health, and the prevention of the eutrophication and sustainable use of natural resources to benefit future generations. Post-consumer waste is regarded as a renewable source of energy and thermal processes, landfill gas utilization the anaerobic gas digester can be employed in order to harness it. Preliminary field investigations in the informal sector enterprises of Harare and Mutare indicated that waste minimization, recycling, and re-use represent an important and increasing potential for indirect reduction of greenhouse gas emissions through the conservation of raw materials, improved energy, and resource efficiency and fossil fuel avoidance. Waste pickers and informal enterprises also require support to form co-operatives, access better equipment, negotiate direct access to waste resources, and generally improve their safety, health, and livelihoods. Governments of cities in developing countries such as Zimbabwe need assistance to understand the value of the informal sector and to incorporate the sector in waste management strategies. The role of the informal sector recycling in climate change abatement should therefore not be underestimated in developing countries. All in all, the paper proposes that in order to reduce greenhouse gas emissions from solid waste, conventional solid waste management needs to be replaced by resource management.

Huge quantities of solid waste are generated in the informal sector enterprises in Harare and Mutare and this is lost without resource value being extracted from them and hence these contribute to greenhouse gas emissions that exacerbate climate change impacts. The response to this problem has been in the form of erratic collections by the municipalities of Harare and Mutare as well as dumping in uncontrolled landfills as well as open dumping by the enterprise operators and the general public. Prevention of waste should be the main focus of solid waste management and this relates to resources conservation as the principal goal of in climate change abatement. Analysis of key factors that include solid waste generation rates, collection frequencies and transportation, waste minimization and reduction practices has shown that the current waste management system gives less priority to environmental protection. The study established that waste minimization

practices employed in the informal sector enterprises of Harare and Mutare involved re-use, recycling, and sales as forms of waste management. Despite the fact that waste minimization is not intentionally undertaken, it has to some extent reduced the amount of waste that is eventually taken to the disposal sites. In most cases, waste minimization is a vital component of solid waste management practices. However, this principle lacks universal applicability in the informal sector enterprises of Harare and Mutare has thus lagged too far behind. The temporary waste storage facilities provided by the City Councils have not been designed to accommodate efficient resource recovery and recycling as well as other waste minimization strategies. This is a result of the haphazard disposal of waste despite the fact that it is biodegradable or not. The amount of solid waste disposed of per enterprise far outweighs the amount of waste recycled and recycling is only undertaken by those enterprises that are willing to do so.

Recycling is a strategy that is expected to consume small amounts of raw materials and less energy with minimal pollution of the environment. Source reduction has a great impact on the whole waste management hierarchy because fewer materials will be needed to be recycled or sent to landfills or even incinerated. The programs and policies that focus on source reduction include Extended Product responsibility that encourages producers to take full economic responsibility of the product from cradle to the grave. Pay as throw programs are also encouraged to force people to pay for their waste disposal and are very effective at reducing waste disposal in landfills. In order to lower waste bills enterprises reduce waste sent to landfills at the source.

**Keywords:** Climate change, Waste management, Greenhouse gases, Informal sector, Waste minimization, Integrated waste management.