

**GENERATING ELECTRICITY FROM WASTE AS A STRATEGY
FOR SOLID WASTE MANAGEMENT IN THE COUNTY OF
NAIROBI, KENYA**

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CHAPTER 1: INTRODUCTION, GENERAL OVERVIEW, PROBLEM STATEMENT, JUSTIFICATION AND OBJECTIVES

“ 1.0 INTRODUCTION

- “ Urban waste management is a growing problem in most African cities due to rapid growth and the limited and deteriorating capacity of many African municipal authorities to collect and safely dispose solid waste. As a result, the private sector is now an important player in the urban waste management sector but at very high cost to urban dwellers.
- “ Consequently, energy from urban waste options are very attractive because of combined benefits of generating useful energy resources while reducing the high cost associated with waste disposal.
- “ In addition, energy from urban waste can be an important source of jobs and income for the urban poor.
- “ Municipal Solid Waste (MSW) in most developing countries is looked at as a liability without any benefits
- “ With the current limited access to energy services and poor sanitation in Nairobi, alternative uses of MSW are inevitable.
- “ The coincidence of worsening solid waste problem and an immediate power requirement create a perfect opportunity for a waste to energy solution

1.2 General Overview

- “ The rapid population growth and increase in Industrialization in cities has resulted in an increased volume of waste generation
- “ Data from the City Council of Nairobi indicate that the average tonnage of solid waste generated in Nairobi is estimated at 1850 ton/day.
- “ Solid Waste Management in the City of Nairobi has over time become a critical environmental hazard due to the following reasons; uncontrolled illegal dumping at unauthorized sites within the city, lack of information by the residents on integrated solid waste management, low levels of waste collection both by City Council and other waste collectors and inefficient institutional and organizational arrangements dealing with solid wastes.

1.3 STATEMENT OF THE PROBLEM

- “ The city of Nairobi, the capital of Kenya, with a population of more than 3 million people according to 2009 population census, is a centre of industry, education and culture occupying an area of 696.1 km² (0.1 per cent of Kenya’s total surface area) and hosting about 25 per cent of Kenya’s urban population (UNCHS 2001).
- “ A half of the present solid waste generation is left uncollected or illegally dumped inside the city and the remaining is carried to a final disposal site at Dandora. The Dandora dump site, however, is an open dumping landfill and this therefore has a detrimental effect on the surrounding environment. Since this situation is creating problems in hygienic, environmental as well as aesthetic conditions for the people of Nairobi City, solid waste management is an urgent issue requiring prompt resolution and prudent management.
- “ As the population increases and being a centre of industry, demand for electricity increases. Electricity shortage obstructs the socio-economic development of the whole nation. Hence the need to study alternatives for disposal of MSW.

1.4 JUSTIFICATION OF THE STUDY

“ The study seeks to investigate and analyze the existing strategies used for waste management by the City County of Nairobi, and seek solutions that will turn the waste into sustainable energy, raise environmental awareness, improve public health and safety, and create employment and entrepreneurial opportunities.

1.5 AIM OF THE STUDY

“ The research will attempt to provide information on Municipal Solid Waste generation and collection, existing management strategies , power generation potential and socio-economics of urban waste management.

1.6 OBJECTIVES OF THE STUDY

- “ To investigate and analyze the existing solid waste management strategies in Nairobi
- “ To investigate how much waste is produced per day , collection & type of waste and suitability of the waste for power generation .
- “ To explore a case for power generation as an urban waste management strategy.

1.7 RESEARCH QUESTIONS

- “ What are the physical characteristics of solid wastes in Nairobi?
- “ What are the current strategies used for managing solid waste?
- “ What is the current volume and type of waste generated?
- “ What is the capacity of the Council towards management of Solid Waste?
- “ What is the management structure of the department handling solid waste and how is it equipped?
- “ How does the department relate with other stakeholders?
- “ What indicators can be used to assess the effectiveness of solid waste management through power generation?
- “ What are the existing regulations and policies on waste management and how supportive and appropriate are they towards energy from urban waste programs?

1.8 SCOPE AND LIMITATION OF THE STUDY

- “ This study is limited in scope considering time availed for undertaking it.
- “ It will not be possible to conduct in-depth interviews and physical field study.
- “ The sample size may be too small for meaningful statistical analysis. However, this study will outline the possible areas of further research required to achieve power generation as a waste management strategy.
- “ Lack of expertise and funding for analysis of collected samples for suitability in electricity generation

1.9 METHODOLOGY OF THE STUDY

- “ The study will be conducted within the County of Nairobi.
- “ *Review of available literature of previous researches done on MSW in Nairobi*
- “ *Review of energy sector documents*
- “ *Review of documents from the Environment section of the Nairobi City County department*
- “ *In-depth interview of respondent group like city county employees and garbage collectors to get insight into existing waste management system*
- “ Collect secondary data through reviewing different reports of the County, web materials, various articles, journals and books
- “ *Sampling techniques:* This study will use both the purposive sampling for qualitative research and census sampling for quantitative research.

- “ *Data collection instruments:* The research instruments for data collection will be in depth personal interviews and questionnaires.
- “ Both structured and unstructured questions will be used for the interview.
- “ Data Analysis: Quantitative data analysis will be done with the aid of the SPSS data analysis software or Microsoft Excel
- “ Quantitative data will be described or summarized using descriptive statistics
- “ The study will be subjected to mean, mode, frequencies, and percentage.

1.10 STRUCTURE OF THE STUDY

- “ Chapter 1: Introduction, general Overview, Statement of the Problem, Justification of the Study, Aim of the Study, Objectives of the Study, Research Questions, Scope and Limitation of the Study, Methodology and Structure of the Study**
- “ Chapter 2: Literature review on solid waste management and waste to electricity projects**
- “ Chapter 3: The Study Area and Policy on Solid Waste Management and electricity generation**
- “ Chapter 4: Data Analysis and Presentation**
- “ Chapter 5: Summary of Findings, Conclusions and Recommendations**
- “ References**