



WOMEN'S INSTITUTE OF TECHNOLOGY AND INNOVATION

DIPLOMA IN COMPUTER SCIENCE

Cohort 4 Semester 1 | 2024/2025 Academic Year

**SMART BIN ENVIRONMENT PROTECTION SYSTEM FOR WASTE
MANAGEMENT.**

BY

(vi)

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A PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF RESEARCH METHODS FOR COMPUTER
SCIENCE IN FULFILMENT OF THE REQUIREMENTS FOR THE

INTRODUCTION:

CHARPTER ONE

1 TITLE:

**AWARD OF THE DIPLOMA IN COMPUTER SCIENCE OF THE WOMEN'S INSTITUTE OF TECNOLOGY AND
INNOVATIONS.**

Table of Contents

WOMEN'S INSTITUTE OF TECHNOLOGY AND INNOVATION	1
DIPLOMA IN COMPUTER SCIENCE.....	1
Cohort 4 Semester 1I 2024/2025 Academic Year	1
SMART BIN ENVIRONMENT PROTECTION SYSTEM FOR WASTE.....	1
MANAGEMENT.	1
COURSE CODE REM 118	2
DEPARTMENT OF RESEARCH METHOD FOR COMPUTER SCIENCE	2
SUPERVISOR: ...MS TUGUME BRENDA...	2
INTRODUCTION:.....	2
CHARPTER ONE.....	2
1 TITLE:.....	2
2 BACKGROUND OF THE STUDY	5
3 PROBLEM STATEMENT.....	5
4 OBJECTIVES	5
5 RESEARCH QUESTIONS.....	6
CHARPTER TWO	6
1 SCOPE OF THE STUDY	6
2 JUSTIFICATIONS.	6
3 SIGNIFICANCE.	6
CHARPTER THREE.....	6
1 LITERATURE REVIEW.	6
2 METHODOLOGY	7
1 Research design;	7
Sampling methods.	7
1 Sampling scope	7
2 Random samplings	7
3 Convenience sampling;	7
4 Purposive sampling;	7
Data collection methods.....	7
DATA ANALYSIS METHODS :.....	7
1 Content analysis;	7

2 Regression analysis;	8
SAMPLE SIZE	8
Survey:	8
Literature review:	8
Data analysis :	8
Sampling frame:	8
Residents	8
Waste management officials;	8
Community members;	8
Stake holders;	8
TECHNOLOGY	8
This smart bin application will be used to;	8
REFERENCES:	9

2 BACKGROUND OF THE STUDY

Rapid urbanization of Kampala as a city has resulted into an increase in the improper waste management all over the city resulting into significant environment and health challenges. The waste management system is inadequate in the way that it has limited waste management collection facilities which has resulted into accumulation of wastes in markets, roads, streets and traches. This therefore has contributed to environmental pollution, and spread of diseases around and all over the cities leading to poor quality of the living standard of people in and around Kampala.

3 PROBLEM STATEMENT

The inadequate waste management system (WMS) has become the main cause of poor disposal. This is because they consider kitezi as the only place for dumping waste and this eventually resulted into the collapse of rubbish hip leading to death of more than (21) people. The lack of resilient awareness on proper waste disposal has also resulted into. The people in Kampala are unaware of what happens whenever there is littering of rubbish and this has resulted into environmental destruction. This also has come along with the issue of policy of creating more dumping areas, providing the waste bins for rubbish collection, tracks that carry rubbish to the disposable sites and this has therefore resulted into poor disposal in and all over the city.

4 OBJECTIVES

To develop the waste management plan for Kampala city.

To assess the current waste management practices in Kampala city.

To identify the challenges facing the existing waste management system.

To explore the solution for improving waste management system in Kampala city.

5 RESEARCH QUESTIONS

What are the challenges and limitations of the existing waste management system.

What are the current waste management practices in Kampala city.

What innovation solution can be implemented to improved waste management in Kampala city.

What are the potential benefits and challenges of implementing a comprehensive management plan in Kampala city.

CHAPTER TWO

1 SCOPE OF THE STUDY

A Scope refers to the specific goal, objectives and boundary of the study. Now our main focus on the waste management practices in Kampala city with the emphasis on the challenges and the limitations of the existing system. This study will eventually help us find the solution for improving waste management by improving the use of Technology in particular smart bin, community participation such as teaching people how to use smart bins, policy intension (actions/strategies)

NEMA (2019) 'Provide an overview of the environmental issues in Uganda including waste management

2 JUSTIFICATIONS.

This study is justified by the to overcome the environmental and health challenges brought by inadequate waste management in Kampala city. Our study will provide insights into the current waste management practices and identify potential solutions for improvement, including Smart Bin application as Technology

3 SIGNIFICANCE.

The significance of our study depends on potential to contribute to the development of effective waste management practices in urban areas. The study will provide an understanding of the challenges and limitations of waste management in Kampala city and getting solutions for improvement including the use of Smart Bin application as the Technology used.

CHAPTER THREE

1 LITERATURE REVIEW.

The literature review will examine the existing research on waste management in urban areas of Kampala including the study of waste generation, collection, transportation and disposal. The review also explore solutions for improving waste management such as use of technology like The Smart Bin, community participation and policy interventions.

2 METHODOLOGY

These methods **will** be used in order to gather and analyses the collected data for the research, these will include both qualitative and quantitative data collection methods.

1 Research design;

Where by we shall we shall mainly focus on Kampala city as our case study.

Sampling methods.

- 1 **Sampling scope;** waste management facilities will selected based on their availability and accessibility.
- 2 **Random samplings;** we shall only select a few residents and waste management officials and these will help to participate in the study and survey.

3 Convenience sampling;

Waste management facilities and services will be chosen basing on their availability

4 Purposive sampling;

Here where a few community members will be selected to participate in groups and give their knowledge about waste management practices in Kampala city .

Data collection methods

1 Survey;

Will be carried out by the waste management officials and the residents on the problems facing this waste management system.

2 Literature review ;

We shall view the existing literature about the waste management system to ensure we come up with the effective solutions to the problems they face as the management of waste.

3 Data analysis;

The collected data from waste management facilities will be analyzed to identify trends

4 Smart bin Application;

Data collected from the smart bin application shall be analyzed to show it's effectiveness in improving waste management practices in Kampala city (Uganda)

DATA ANALYSIS METHODS :

1 Content analysis;

This will be used to analyze literature review that will identify best practices and problems faced by waste **management** system

2 Regression analysis;

It will be used to analyze data from waste management services and identify relationship between variables

SAMPLE SIZE

The size for the study will be;

Survey:

Will take 75 residents and 25 waste management officials.

Literature review:

It will need 40 articles and reports all together.

Data analysis :

Ten (10) waste management services and facilities

Sampling frame:

Sampling frame of the study will be;

Residents; People of Kampala city.

Waste management officials;

Official from Kampala Capital City Authority (KCCA) and the private waste management companies.

Community members;

Neighbors from different community in Kampala city.

Stake holders;

From government agencies ,private sectors and society organizations involved in waste management in Kampala city.

TECHNOLOGY

The smart bin application is the mobile-based application that allow residents to reported waste management problems and track the status of the waste collection in their area.

This smart bin application will be used to; [1]

- It will collect data about the waste collection and disposal patterns.
- Identify areas in Kampala city with high waste generation rate.
- Provide a real-time information on the waste collection schedules and route used for collecting waste.
- Enable residents report problems of the waste management and track status of waste collection.

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REFERENCES:

Study references for this research .

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[1] Kampala Capital City Authority, *Kampala Solid Waste Management Strategy 2020*, KCCA, Kampala, Uganda, 2020. [Online]. Available: <https://www.kcca.go.ug>

[2] World Bank, *Solid Waste Management in Urban Areas of Uganda: Challenges and Recommendations*, 2021. [Online]. Available: <https://www.worldbank.org>

The city generates over 2,500 tons of waste daily [1]. However, only a portion of this is collected and properly managed [2].