



**FACULTY OF ENGINEERING**  
**DEPARTMENT OF MINING AND WATER RESOURCES ENGINEERING**  
**WATER RESOURCES ENGINEERING PROGRAM**  
**FINAL YEAR PROJECT REPORT**  
**DESIGN AND CONSTRUCTION OF AN ELECTRIC AND BIOMASS POWERED SMALL**  
**SCALE INCINERATOR TOILET**  
**(CASE STUDY: BUWALI IDP CAMP)**

**BY**

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*A final year project proposal report submitted to the Department of water resources and mining engineering in partial fulfilment for the award of the Bachelor of Science in Water Resources Engineering degree at Busitema University*

## **ABSTRACT**

Recent estimates suggest that approximately 40% of the world's population does not have access to an adequate sanitation system. The development of technology in the emergency sanitation sector has not been emphasized sufficiently. The practices of open defecation, container based sanitation and pit latrines in Buwali Internally Displaced Persons Camp although cheap, have a potential to stimulate growth and spread of bacteria in rivers and wells around if done improperly. In an attempt to increase access to emergency sanitation in there, some of the implemented ways to curb this problem include; use of methods like ecosan toilets, compost toilets, small scale incineration toilet, among others have been proven to be not very effective. There is need to develop sustainable toilets that can be used in areas with a low height and a movable one that can be easily carried by simply assembling and disassembling it in case of emergency situations. This report describes the design and construction of an electric and biomass powered small scale incinerator for use in emergencies that was developed in response to the inadequate sanitation in Buwali Internally Displaced Persons Camp. The device was developed by understanding the fundamentals of fecal material and the physical and chemical fuel properties. The critical variables estimated include the mass and volume of the fecal matter, source energy requirements, the stoichiometric air requirement and waste generation. The exhaust gas is collected off for other studies and use. The char is used as a binder to produce charcoal briquette from biomass waste. Briquettes production and exhaust gas usage provides a sustainable energy source for the toilet. The result is a prototype powered by both electricity and bioenergy that can sanitize fecal waste.

**DECLARATION**

I **MUDONDO LUBBA**, declare that all the material portrayed in this project proposal report is original and has never been submitted in for award of any Degree, certificate, or diploma to any university or institution of higher learning.

Signature

.....

Date

.....

## **ACKNOWLEDGEMENT**

I would like to extend my sincere thanks to the almighty GOD who has gifted me with life and has enabled me to reach this academic height as he has been the provider of all the necessary requirements.

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**APPROVAL**

This is to certify that the project proposal has been carried out under my supervision and this report is ready for submission to the Board of examiners and senate of Busitema University with my approval.

**MAIN SUPERVISOR:**

**MR. MASERUKA BENDICTO**

**SIGNATURE:** .....

**DATE:** ...../...../.....

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## **LIST OF ABBREVIATION**

DRC:	Democratic Republic of Congo
IDP:	Internally Displaced People
NBS:	National Bureau of Standards
NPV:	Net Present Value
O&M:	Operation and Management
P. I:	Probability Index
SDG:	Sustainable Development Goal
UNEP:	United Nations Environment Programme
UNHCR:	United Nations Refugee Agency