



**BUSITEMA
UNIVERSITY**
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF MINING AND WATER RESOURCES ENGINEERING

FINAL YEAR PROJECT

TITLE:

DESIGN AND CONSTRUCTION OF A WATERLESS COMPOSTING TOILET

A Case Study of

Majanji

Submitted by:

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A final year project report submitted to the Department of Mining and Water Resources Engineering as a partial fulfillment of the requirements for the award of a Bachelor of Science degree in Water Resources Engineering.

ABSTRACT

This report entails the information for the design and construction of waterless composting toilet. With the background that about 2.5 billion lack proper sanitation options and about 1 billion practice open defecation. Many toilet techniques have been explored including the composting. The available techniques of pit latrines in most parts of Africa still risks potential of ground water pollution. High expenses in the flush toilet option and its water requirement makes it uneconomical. Composting of waste does not only reduce waste but also produces energy that can be utilized in other forms.

Different parts of the system were designed and constructed. Archimedes screw conveyor, urine diverting system, the motor assembly, the PV system were all assembled to make the toilet system. The overall cost of construction was 1.200.000 UGX. The conveyor operates at 45% full pitch volume. The conveyor efficiency is 82% and the composting efficiency is 92% as achieved in the fecal coliform reduction in the compost effluent. The system achieves 73% mass reduction of waste by the composting process. Composting bin maximum content volume to be 80% of the drum capacity. For a 6-member household, the desludging period is estimated to be 2 months. The system has a low energy consumption, with maximum power of 68W required by the motor.

Economically the option is profitable to the owners in terms of waste recycling, sludge production that can be used as soil improvers. This saves the farmer, fertilizer cost and increase in yield. Use of saw dust or ash as solid additive proves to provide option for wastes.

The conveyor was operated with a motor at speed of 45rpm. Use of low-speed motors was recommended. There should be regular turning of the composting content especially at ½ full volume to regulate temperate and avoid anaerobic condition in the bin.

DECLARATION

I OKENG RONALD RAY solemnly affirm that this project REPORT is the work of my hands and has never been submitted to any university, college or any other institution for any academic award

Date:

Signature:

APPROVAL

This has been compiled under my guidance and consultation

Supervisor: **MR. WANGI MARIO GODFREY**

Date:

Signature:

Co supervisor: **MR. BENEDICTO MASERUKA**

Date:

Signature:

DEDICATION

I dedicate this report to my parents for their support and facilitation during the project making.

ACKNOWLEDGEMENT

I would like to acknowledge the efforts of Mr. Benedicto Maseruka for his efforts and guidance in this project. Great thanks to Ali Kibirige for his assistance during the construction. My friends Egeu John Pascal, Susan Orikiriza and class mates.

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