



FACULTY OF ENGINEERING
DEPARTMENT OF WATER RESOURCES AND MINING ENGINEERING
FINAL YEAR PROJECT REPORT
**DEVELOPMENT OF A MOTORIZED SEWAGE SUCKER MACHINE FOR EMPTYING
FILLED MANHOLES**

BY

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ABSTRACT

Referring to the informal settlements within Bwaise III zone, central Kampala City, pit latrines are the most common and cost-effective onsite sanitation facilities. However, the lack of effective technological options poses challenges when latrines get full. Vacuum tankers currently influence the market but focus on emptying septic tanks in the most accessible areas only, rather than hard to reach areas where pit latrines and filled manholes reign. Alternative emptying technologies, such as the Gulper Pump and Diaphragm Pump, have had limited success in filling the technological gap. Hence, households in informal settlements within Bwaise essentially relies on manual pit emptying involving shoveling by hand and digging new pit latrine. These practices correlate with health risks and dreadful space limitations. An emptying machine must be sustainable, which means it must be able to be fixed locally, and quickly. This study assessed the design, construction, and evaluation of a multi-piston pump for emptying filled pits. The design adopted was a motorized emptying technology that can be constructed from recycled materials and locally available materials like motorcycle wheels, scrap metals, rubber, and plastics. Based on the uncovering during testing, the motorized sewage sucker machine is a prospective pit latrine emptying machine in Bwaise slum. However, the developed motorized sewage sucker is not yet as optimized as globally available pit latrine emptying technological options. Hence further alterations are recommended based on current design constraint

DECLARATION

I **OKUDINIA BRIDGET**, 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

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Date

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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 requirements.

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Not forgetting Massa Richard and Okeng Ronald for the assistance offered during the testing phase of the project.

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.

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LIST OF ACRONYMS AND ABBREVIATIONS

Table 1: List of abbreviations

Acronyms	Meaning
FS	Fecal sludge
FSM	Fecal sludge management
SSM	Sewage sucker machine

KCCA	Kampala City Council Authority
MDG	Millennium Development Goals
SDGs	Sustainable Development Goals
UN	United Nations
UNHSP	United Nations Human settlements program
WHO	World Health Organisation
WSP	Water Sanitation Program
USD	United States Dollars
O&M	Operation and Maintenance
PVC	Polyvinyl chloride
HDPE	High-density polyethylene