

**BUSITEMA
UNIVERSITY**
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF WATER RESOURCES ENGINEERING

THE FINAL-YEARPROJECT REPORT

**REDESIGN AND CONSTRUCTION OF A PORTABLE CYLINDRICAL TANK
CLEANING MACHINE.**

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REG NO: BU/UP/2019/1833

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A final year proposal report submitted to the Department of water resource engineering in partial fulfillment for the award of the Bachelor of Science in Water Resources Engineering degree of Busitema University

SEPTEMBER 2023

ABSTRACT

The cleanliness of the storage tanks is critical, and it should be strictly monitored and maintained; otherwise, the quality of the water stored in them deteriorates, leading to water contamination. Water contamination can occur as a result of a buildup of sediments providing a breeding habitat for microorganisms such as bacteria and viruses. If left unchecked, these microbes can spread and contaminate the water causing skin diseases, and a bad odor of the water.

The established project enables the effective cleanliness of the tank with reduced labour intensiveness. The system component are categorized into two; the mechanical and the electrical components. The mechanical components include a hollow shaft, horizontal linkages (the umbrella mechanism), scrubbing brushes, bolts/rivets, Support, pinion and rack mechanism. Electrical components include rechargeable batteries, switches, wires, single phase geared motor. A water system is also incorporated in the system which includes pipes, a high-pressure jet to aid in the cleaning process, a small reservoir with a control valve, and water bowl which holds the water in use.

This machine can be disassembled for easy transportation and then reassembled when to be used. The rack is placed over the support to enable the pinion (screw teeth) to move up and down. Simultaneously the components containing the arms of the brushes (umbrella mechanism), the high-pressure washer, the motor, water bowl are connected together with the rack and connected by a bolt and nut then tightened. After the connection, lower the downer components into the tank after adjusting the brushes to the diameter of the particular tank to be cleaned and fold the arms to enable it enter through the opening of the tank. This is done after all the water from the tank to be cleaned is removed. When the components are inside the tank, the upper linkage is stretched to enable the brushes to reach the particular diameter as measured before. Switched on, the motor runs the brushes in a circular motion as well the water jet to jet the water to the walls to lubricate the wall as well as aid in the cleaning.

DECLARATION

I FUAOLA TRACY a student of BUSITEMA UNIVERSITY with a registration number of BU/UP/2019/1833 hereby declare that, this report is a true work of my hands and has never been presented by any person or institution for an academic award.

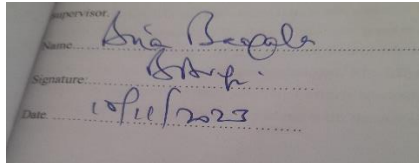
Signature:

Date:

APPROVAL

This report is submitted as partial fulfilment for the award of Bachelor's Degree in

Water Resources Engineering of Busitema University, with my approval from my project supervisor.



ACKNOWLEDGEMENT

First and foremost, I would like to thank the almighty God for this guidance, protection and knowledge. I would like to thank my parents and siblings for their encouragement and support both spiritually and financially. My sincere gratitude goes to my final year project Supervisor, Mr.

Bagaala Brain for his guidance, the projects coordinator Mr. Maseruka Benedicto, Mr. Ologe Hector Daniel the water resources department technician, Mr. Elijah the Busitema workshop custodian and all my other lecturers for their combined efforts towards my success at BU, FOE, and Water Resources Department who have equipped me with the necessary knowledge that has enabled me to excel in academics.

DEDICATION

I dedicate this final year report to my parents Mr. Jukwongu Geoffrey and Mrs. Canwegu Magret who have worked hard to make sure I reach to this stage of my education and siblings Jakwang Rogers, Ngangeyo Herbert, Ngabiroch Winnie, Akech Cissy including myself, my colleagues. And

anyone who took part in this part of my education physically, emotionally, financially, and spiritually.

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LIST OF ACRONYMS

ACRONYMS	MEANING
GI	Galvanized Iron
WHO	World Health Organization
Et	And others (on citations).
BU, BUMC	Busitema University, Busitema University-Main Campus
HEP	Hydroelectric Power
DC, AC	Direct Current, Alternating Current.
FOE	Faculty of engineering.

CHAPTER ONE

1.0 Introduction

This chapter consists of a background, problem statement, justification, and the objective of the study.

1.1 Background

Water is a vital component of life as it plays a crucial role in sustaining the ecosystem on which all life depends. Water has many important uses which include drinking, cooking, hygiene and sanitation, agriculture and irrigation, industry and manufacturing, and recreation(FAO, 2017).

Globally, According to WHO and UNICEF (2021), around 2.2 billion people around the world lack access to safe drinking water and 74% of the global population uses a safely managed drinking water service which is defined as water located on the premises and available when needed. However, 1.2 million people are estimated to have died as a result of unsafe water sources in 2017 which accounted for 2.2% of global deaths (UN Water, 2019).

In Africa, 39% of the population used safely managed drinking water, 27% used safely managed sanitation and 37% used basic hygiene in 2020. In urban areas, 2 out of 5 people still lack safely managed drinking water(UNICEF and WHO, 2020).

A water tank is a container for storing water. They are utilized in a variety of settings, including homes, institutions, religious institutions, medical facilities, water distribution and supply firms, bottling companies, public and commercial structures, irrigation, and fire suppression.

According to a 2017 report by the Ugandan Ministry of Water and Environment, only 68% of the population has access to safe drinking water, with the majority of the remaining 32% using surface water sources such as lakes, rivers, and springs.

In urban areas of Uganda, it is common to find households that store water in storage tanks or other containers due to unreliable or intermittent water supply from municipal systems. However, in rural areas where access to water is often limited, storing water in tanks may not be a viable option for many households(Marks et al., 2020).

In Uganda, plastic, concrete, steel, ferrocement, and underground tanks are commonly used for storing water. Plastic tanks are popular due to their affordability and ease of maintenance, while concrete tanks are durable and suitable for larger-scale storage(*Types of Water Tanks in Uganda – EMSult Engineers*, n.d.).

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