BUSITEMA UNIVERSITY
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF MINING AND WATER RESOURCES ENGINEERING

DESIGN OF RAIN WATER HARVESTING SYSTEM FROM A ROCK CATCHMENT

(A case study of Nyasigala Village – Tororo District)

BY

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ABSTRACT

Water is life and agricultural production, unfortunately water is unevenly distributed across the globe as some areas receive it in abundance while others get less than inadequate. In the arid and semi-arid regions of the world, rainwater harvesting was necessitated to buffer the acute shortages and scarcity. Uganda Government's commitment to providing clean water to its population, it faces severe constraints due to shortage of funds for development and the cost of maintaining existing water supply projects.

Clean water prevents the occurrence of certain diseases and therefore helps in keeping man healthy and enables him to perform his day to day activities. However, this can only be realized if the clean water is available and conveniently reached by man. The potential benefits of rainwater harvesting include the availability of relatively clean water close at hand and the reduction in time and labor for fetching it.

This project is aimed at designing a rock catchment rainwater harvesting system that would help in supplementing the water demand for the locals at Tororo, Nyasigala village were the rock catchment is located. The project is also focused on minimizing the cost through appropriate planning and designing of a rock catchment run-off water harvesting system coupled with the use of available storage technologies and local materials within the reach of the local communities.

The field data will be collected through observations, physical measurements, sample acquisition and use of existing records on the study area. The project will analyzed rainfall data and population data for humans. The analysis involved population projection, calculation of the catchment area, sizing of the conveyance system as well as sizing and design of the tank in accordance with the available run off and the demand

DECLARATION

I **OGEN MOSES**, hereby declare that each piece of information presented in this project proposal is my own work and that to the best of my knowledge has never been submitted by any other person to any institution of learning for an academic award of any kind.

Signature: ..... Date: 25/5/2015

APROVAL

This project report has been submitted for examination with my approval as university Supervisor for the award of Bachelor of Science in the Department of Water Resources Engineering, Busitema University.

Sign.....

Date.....26-05-2015.....

Mr. Oketcho Yoronimo

Main supervisor

Sign.....

Date.....

Mr. Mugisha Moses

Co-supervisor

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ACRONYMS

PVC	–	Polyvinyl chloride
GI	–	Galvanized iron
BSC	–	Bachelor of Science
DWD	–	Directorate of Water Development
WHO	–	World Health Organization
NTU	–	Nephelometric Turbidity Units
Mm	–	millimeters
m^2	-	square meters
m^3	-	cubic meters
Km	–	kilometers
UNEP	–	United Nations Environmental Programme
UNDP	–	United Nations Development Programme
RWH	–	Rainwater Harvesting
NGO	–	Non-governmental Organization
BS	–	British standard

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CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter presents the general information relevant to the research as it clearly shows the problem of interest for the intended research. It as well shows how this study will help reduce the problem through the fulfillment of a number of objectives listed.

1.1Background

Water is determinant for existence of life and a vital factor in agricultural productivity. Africa is considered a water-scarce continent with most of the countries regularly experiencing extreme water shortage resulting to periodic dry spells. About 44% of people living in developing countries do not have access to clean water (UNEP). As of June 2014, Uganda's population with access to safe water in the urban area was 72.8% from 70% in the previous financial year while rural population with access to safe water remains at 64% which is similar to the figure as June 2013, the average functionality of rural water supplies was at 85% which is 5 percent points less than the sector target of 90% by 2015, MDG 7 target 10.

(www.mwe.go.ug, December 2014)

The name of the village is Nyasigala located in Mulanda sub county Tororo District. Nyasigala village relies on seasonal water sources a borehole and unprotected spring, in dry seasons, natives travel more than 3 km to the nearest water sources due to scarcity.

This project is aimed at designing rock catchment rainwater harvesting system and a reservoir to allow gravity flow as a supplementary water source, focusing on minimizing the costs coupled with the use of available storage technologies and local materials within the reach of the local communities.

1.1.1 Climate of Tororo

The climate is sub humid with bi-modal rainfall with peaks during the months of May and October. The average annual temperature in Tororo is 22.4 °C. The average annual rainfall is 1468 mm. (en.climate-data.org/location/30800/, 10.October 2014)

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