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WATER RESOURCES ENGINEERING PROGRAMME

FINAL YEAR PROJECT REPORT

**DESIGN OF AN OFFSHORE SHALLOW SANITARY SEWERAGE SYSTEM FOR A LOW
INCOME COMMUNITY IN NAMUWONGO KASANVA AREA KAMPALA UGANDA**

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Abstract

This report is majorly made up of five chapters, the first chapter introduces the need to slum/squatter appropriate sanitation, it gives a brief back ground of the project area (case study) and why sanitation should be considered a core. This chapter further includes the objectives to the project, justification of the systems to be used and the scope of the study. The scope was limited to only Namuwongo Kasanvu slum.

Chapter two is all about reviewing the previous literature about the various sanitation technologies (options) major consideration being stressed on off-site technologies "small diameter gravity flow systems"/ simplified sewerage systems. The reviewed literature includes systems such as shallow sewerage systems, small bore sewerage systems and small diameter gravity sewers.

Chapter three has the methods, technics and the principles followed in the process of designing the shallow sewerage systems. The methods include data collection, population projection, wastewater quantification, Arc-GIS application in the topographical assessment, and the system designing tool using sewer cad.


Chapter four majorly has the results, discussion and the analysis of the project

Chapter five is the last in this report and it includes conclusions and recommendations. The recommendation majorly stresses normally bottom up management which involves public management of the designed sewer and sanitary facility management.

The remaining sections have the references of the project and the appendices, the appendix section has two parts A and B.

Declaration

I Katamba Humphrey T do declare that this project report for the design of an offshore shallow sanitary sewer system in Namuwongo Kasanvu is as a result of my own research and has never been presented in any academic institution for any award.

Signature:  Date: 27/05/2017



Approval

This project report of the Design of a (offshore sewerage system) shallow sanitary sewer system has been written under the supervision of;

Main supervisor

Name.....Signature Date.....

Co-supervisor

Name.....Signature Date.....

Dedication

This report is dedicated to the family of Mr. and Mrs. Katamba for the guidance, love and financial support with much love to Dad, mum, Israel, Jonathan, Emma and Rita. Together we have made it.

Acknowledgement

I thank the Almighty God for the great provision and guidance towards my final year project accomplishment.

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With great concern, I send my sincere appreciation to my father Dr. Katamba Vincent and my dear mother Mrs. Anna Katamba for all the material and financial support they offered throughout my education.

Finally, in special attention, I convey my sincere appreciation to my mentor Dr. Eng. Sonko Kiwanuka for the technical assistance and encouragement towards my smooth run in the engineering school. May the Almighty God reward them abundantly.

List of Acronyms

| | |
|--------|--|
| WHO | World Health Organization |
| UBOS | Uganda Bureau of Statistics |
| NWSC | National Water and Sewerage Organization |
| SuSanA | Sustainable Sanitation Alliance Uganda |
| MOH | Ministry of Health |
| CAD | Computer Aided Design |
| MDGS | Millennium Development Goals |
| BOD | Bio-chemical oxygen demand |
| COD | Chemical Oxygen Demand |
| SDGS | Small Diameter Gravity Sewers |
| II | Infiltration/Inflow |
| UPVC | Un-plasticized polyvinyl chloride |
| GPS | Global positioning system |

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CHAPTER ONE

1.0. Introduction

This chapter outlines the relevant information and clearly shows the problem of interest for the research. It stipulates how this study will help reduce the problem through fulfillment of objectives discussed below

1.1 Back Ground

In 1983, the world Health organization estimated that of the 2552 million people who live in the four developing regions of Africa, Asia and the pacific (excluding China), Latin America and Western Asia less than a third had access to adequate sanitation. Urban areas are usually better endowed with sanitation than rural areas. An estimated 59 per cent of the total urban population in developing countries has adequate sanitation services while only 12 per cent of the rural people are served. Where deficiencies have occurred in urban areas, these have been in low income communities. Approximately 60 per cent of the population of Latin America is now urbanized yet urban growth rates are expected to remain high until the end of the century. Slums and squatter settlements which house majority of low income urban people form 30 per cent of Recife, 60 per cent of Bagota, 72 per cent of Santo Domingo and 46 per cent of Mexico City. Sanitation coverage in these deprived urban areas is often no better than in the rural areas. With only about a quarter of Africa's population living in urban areas, the continent is now experiencing the highest urban growth rate in the world, 5 per cent per annum. Slums and squatter settlements accommodate over 90 per cent of the population of Addis Ababa, 61 per cent of Accra, 31 per cent of Nairobi and 50 per cent of Monrovia.

Uganda is one of Africa's most rapidly urbanizing countries, with a population base estimated at about 36 million people (*UBOS, 2014*), a high population growth rate of 3.2% and a high rate of urban growth about 5% per annum. In Kampala, majority (70%) of the urban poor use shared latrines; with less than half (47%) of the latrines clean enough to be used and another 45% of the facilities being abandoned. The various sanitation initiatives in urban poor areas have not emphasized improved use, cleaning and maintenance of the available facilities; emphasis seems

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