



**BUSITEMA  
UNIVERSITY**  
*Pursuing Excellence*

**FACULTY OF ENGINEERING**

**DEPARTMENT OF WATER RESOURCES ENGINEERING**

**FINAL YEAR PROJECT REPORT**

**DESIGNING A RAIN WATER FILTRATION SYSTEM  
USING ACTIVATED CARBON AND SAND**

**CASE OF HOUSE LEVEL**

**BY**

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*A project proposal submitted to the Department of Water Resources Engineering  
in partial fulfilment of the requirement for the award of the Bachelor of Science in  
Water Resources Engineering of Busitema University*

## ABSTRACTS

Rainwater harvesting technology is increasingly being practiced in Uganda as a means of curbing the water scarcity challenge in the country. Busitema university-faculty of engineering and technology found in eastern Uganda provides accommodation to students inside the campus but biggest fraction of students resides in privately owned hostels outside the campus. One of home state named Mr. Okello Kennedy installed a rainwater harvesting system for her household members but the challenge discovered is that the system lacks a filtration unit yet members would wish to use this water for potable purposes. This project therefore was focused on designing a rainwater filter using local materials like sand, gravel, and activated carbon. This report is divided into five chapters. Chapter One: This chapter contains the project background of the study, the problem statement, the purpose of the study, justification of the study, the objectives of the project and finally the scope and the limitations of the project Chapter Two: This chapter reviews all the necessary literature relevant to Rooftop RWH system, it gives the different contaminants found in rainwater, the major materials used in rainwater filter designing, different rainwater treatment technologies available and water quality assessment. Chapter Three: This chapter describes all the methodologies which were followed during the designing of the filter system following the objectives including; raw water quality assessment, designing the system components, constructing the different components and assembling them, evaluating the performance of the system prototype. Chapter Four: This chapter gives the analysis and discussion of the results from chapter three as per the objectives. Chapter Five: This chapter entails the conclusion on the results from Chapter Four and the recommendations from the results.

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## DECLARATION

I, the undersigned, declare that this research proposal is my original work except where due acknowledgement has been made. I declare that this work has never been submitted to this university or any other institute for funding or for partial fulfillment for any award.

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## APPROVAL

This research proposal submitted as a partial fulfilment for the award of Bachelor degree of science and water resources engineering of Busitema University, with my approval as the academic supervisors.

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## **Lists of acronyms**

|            |                                              |
|------------|----------------------------------------------|
| RWH.....   | Rainwater harvesting                         |
| WHO.....   | World Health Organization                    |
| NSDWQ..... | National Standard For Drinking Water Quality |
| NDP.....   | National Development Plan                    |
| EC.....    | Electrical Conductivity                      |
| TSS.....   | Total Suspended Solid                        |
| NTU.....   | Nephelometric Turbidity Units                |

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## APPENDICES