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**FACULTY OF ENGINEERING**

**DEPARTMENT OF WATER RESOURCES ENGINEERING**

**FINAL YEAR PROJECT REPORT**

**DESIGN AND CONSTRUCTION OF A SOLAR POWERED WATER TRANSMISSION  
SYSTEM**

**CASE STUDY: BUSITEMA HALLS, BUSITEMA UNIVERSITY**

**OBONYO RYAN**

**BU/UP/2019/1885**

**[obonyoryan@gmail.com](mailto:obonyoryan@gmail.com)**

**BAALE JOHN CRYSTOM**

**BU/UP/2019/1844**

**[baalejohn40@gmail.com](mailto:baalejohn40@gmail.com)**

**SIMERA DISON MOLSON**

**BU/UP/2019/1822**

**[olsonsim164@gmail.com](mailto:olsonsim164@gmail.com)**

Final year proposal report submitted to the department of water resources engineering in partial fulfillment for the award of bachelors of science in water resources engineering

## DEDICATION

We dedicate this report to our Parents, our dear lectures, fellow students and friends.

## ACKNOWLEDGEMENT

We would like to extend our sincere gratitude to the Almighty God who has given us life to reach this milestone in our Academic journey.

Sincere thanks to our fellow students and other lectures for their continuous generous support.

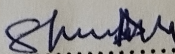
Special thanks to our supervisors Mr. Ologe Hector Daniel and Mr. Badaaza Mohammed for their continuous guidance towards the development of this idea.

May the good Lord bless you!

DECLARATION

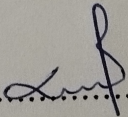
I **SIMERA DISON MOLSON, OBONYO RYAN, BAALE JOHN CYRSTOM**, hereby declare that this final year project is our own research work and has not been previously submitted to any institution of higher learning for any kind of award to be achieved.

**SIMERA DISON MOLSON**

SIGNATURE: .....  .....

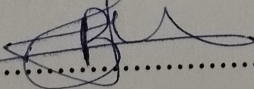
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**OBONYO RYAN**

SIGNATURE: .....  .....

DATE: ..... 22 / 02 / 2024 .....

**BAALE JOHN CYRSTOM**

SIGNATURE: .....  .....

DATE: ..... 22 / 02 / 2024 .....

**APPROVAL**

This is to certify that this final project proposal has been written under the guidance of our supervisor and it is to be handed over to the Department of Water Resources Engineering Busitema University.

**SUPERVISOR 1;**

**NAME: MR. OLOGE HECTOR DANIEL**

**SIGNATURE: .....**

**DATE: ...../...../.....**

**SUPERVISOR 2;**

**NAME: ~~MR. BADA AZA MOHAMMED~~**

**SIGNATURE: Handwritten Signature**

**DATE: 22/02/2024**

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# 1 CHAPTER ONE

## 1.1 INTRODUCTION

### 1.1.1 BACKGROUND

Water has been a major issue on the international agenda for several decades as the most essential resource for life (Mancosu, Noemi, 2015).

The world is rapidly urbanizing. From 1950 to 2020, the global population living in cities increased from 0.8 billion (29.6%) to 4.4 billion (56.2%) and is projected to reach 6.7 billion (68.4%) by 2050. Water scarcity, where demand exceeds availability, is a key determinant of water security and directly affects the health and wellbeing of urban residents, urban environmental quality, and socioeconomic development (He Chuyang, 2021).

The UN Sustainable Development Goals (SDGs), particularly SDG11 *Sustainable Cities and Communities* and SDG6 *Clean Water and Sanitation*, may be compromised as a result of urban water scarcity, which is predicted to worsen in the future (He Chuyang, 2021).

The concept of water resources includes qualitative socio-economic and environmental dimensions in addition to its quantitative and physical dimensions. There are two categories of water resources: those that are renewable and non-renewable water resources. Deep aquifers, which have a negligible replenishment rate on a time scale relevant to humans, are regarded as non-renewable water resources, in contrast to groundwater and surface water, such as the average annual flow of rivers (Mancosu et al., 2015).

The lack of freshwater is increasingly seen as a global systemic problem. Due to a failure to account for the seasonal variations in water availability and consumption, previous global water scarcity assessments, which measure water shortage annually, have overestimated actual water scarcity. According to research, two-thirds of the world's population (4.0 billion people) experience severe water scarcity for at least one month of the year and half a billion people in the world face severe water scarcity all year round (Islam & Susskind, 2015).

Freshwater scarcity is now clearly posing a threat to the continued advancement of human society due to a steadily rising demand over the past few decades. The World Economic Forum lists water crises as the greatest global risk in terms of potential impact according to one of its



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