FACULTY OF ENGINEERING

DEPARTMENT OF WATER RESOURCES ENGINEERING

FINAL YEAR PROJECT REPORT

ASSESSMENT OF THE IMPACT OF POLLUTION ON THE WATER QUALITY OF RIVER ATURUKUKU

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A final year project submitted to the Department of water resources engineering in partial fulfillment of the requirements leading to the Award of a Bachelor's degree in Water Resources Engineering from Busitema University.

ABSTRACT

Rivers are crucial natural resources that provide essential ecosystem services, including water supply and habitat for aquatic life

The impact of pollution on the water quality of the Akurukuku River was assessed so that preventive measures may be taken. The objectives were, to identify the sources polluting the river, to determine the level of contamination, to come up with water quality model to simulate the fate of the pollutants, and finally to develop mitigation strategies to eliminate the pollution

The expected results included the identification of potential sources of pollution, determining the level of pollution, and coming up with a water quality model which will help in coming up with different mitigation strategies

The research was to come up with solutions to the problem of pollution in the river Akurukuku. The scope of the study was limited to the above-mentioned river and a section was selected.

In conclusion, the sources of river pollution offer information on the numerous causes and effects of river pollution as well as long-term fixes for cleaning up contaminated waterways. These resources can be used by researchers and decision-makers to guide their efforts in creating efficient laws and strategies in order to reduce pollution.

DECLARATION

I KIBIRA ABDULFATAH YIGA AND I MUSASIZI AGGREY do hereby declare that to the best of our knowledge and belief that this report is our original work and has never been submitted to any other University, college, or Institution of higher learning for the purpose of meeting any academic requirement. It is therefore authentic and where any references or secondary information have been used, they have been given due acknowledgment.

MUSASIZI AGGREY

KIBIRA ABDUL FATAH YIGA

Signed..... .....

Date.....

APPROVAL

I Mujugo Emmanuel declare that, have supervised this study and that in my opinion, it confirms to accepted standards of the scholarly report in partial fulfillment for the award of Bachelor of Science in water resources engineering at Busitema University.

Signed.....

(Project Supervisor)

Date.....24/01/2024

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List of acronyms

WHO	World Health Organization
NWSC	National Water and Sewerage Corporation
GPS	Global Positioning System
DO	Dissolved Oxygen
WH	Water hardness
GIS	Geographic Information System
SWAT	Soil, water and topography
TDS	Total dissolved solids
TP	Total phosphorous
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand

1 CHAPTER 1

1.1 Introduction

This chapter entails relevant information about the project background, problem statement, purpose, justification, objectives, and the scope of the study.

1.2 Background

Water pollution is an environmental problem that affects water bodies worldwide, i.e, rivers, streams, lakes, and oceans. The situation has worsened in almost all rivers in Africa, Asia, and Latin America since the 1990s (Hoven *et al*., 2017). In Uganda, water pollution is a significant concern, with many water bodies, being vulnerable to contamination from various sources.

Regarding River Aturukuku, residents were using the water for drinking and other domestic purposes. In recent decades the water in this river started getting coloured developing a unique smell. The changing color and smell seem to be an indication that the water in this river is experiencing some pollution. There are a number of activities taking place along this river such as; farming, industrialization, and also likely deposition of municipal wastewater. Such anticipated pollution of the water in this river has led the locals to stay away from using this water for domestic purposes considering it contaminated (*Tororo Locals Launch Drive to Save Wetland _ Monitor,* n.d.)

Agriculture is one of the major economic activities in the Tororo district, with many farmers relying on the Aturukuku River for irrigation. However, the use of pesticides, fertilizers, and other agrochemicals could be leading to the contamination of the river, posing a risk to human health and the environment(Wang & Yang, 2016). In addition, poor land management practices, including soil erosion, could lead to increased sedimentation in the river, further degrading water quality (Nalubega., 2019).

Also, the textile industry in Tororo could be another significant source of water pollution on this river. The industry generates large volumes of wastewater that contain various chemicals, such as; dyes, surfactants, and solvents. Most of the wastewater is discharged into this river and is likely to be untreated leading to significant water pollution and the subsequent environmental damage and health risks to people living near the affected water bodies (Kiremire & Lubwama, 2021)).

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