



FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF WATER RESOURCES AND MINING ENGINEERING
A POLLUTANT TRACKING MODEL FOR MITIGATING THE EFFECT OF
URBANISATION ON WATER QUALITY OF RIVER NAMATALA

BY

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ABSTRACT

Urbanization significantly impacted water quality by introducing pollutants into river systems, necessitating effective tracking and mitigation strategies. This study developed a pollutant tracking model for River Namatala to assess and mitigate the effects of urbanization on its water quality. The research employed a combination of field data collection, laboratory analysis and modelling techniques to characterize pollutants, track their sources, and propose mitigation measures.

The study began by identifying key pollutants affecting River Namatala through water sampling and laboratory analysis. Parameters such as turbidity, dissolved oxygen, biochemical oxygen demand (BOD), chemical oxygen demand (COD) and nutrients were analysed to determine the extent of pollution. The research integrated SWAT (Soil and Water Assessment Tool) as the primary modelling framework, enabling the simulation of pollutant transport and source identification. Additionally, statistical analysis using Excel sheets was applied to characterise the pollutants, providing insights into their variation across different locations and seasons.

The findings indicated that urban runoff, industrial discharge and agricultural activities were the primary contributors to water pollution in River Namatala. High concentrations of nutrients and organic matter suggested eutrophication risks while this contamination posed concerns for public health and aquatic life. The pollutant tracking model effectively mapped pollution hotspots and predicted potential future trends under different land use scenarios.

Based on the model's outputs, the study proposed targeted mitigation strategies, including improved wastewater management, riparian buffer restoration, and policy recommendations for urban planning.

This study provided a comprehensive approach to pollutant tracking and mitigation in urbanized river systems. The integration of field data, laboratory analysis and modeling tools offered a replicable framework for managing water quality challenges in similar environments. The recommendations derived from this study could guide policymakers, water resource managers and stakeholders in developing effective strategies to safeguard water quality amid increasing urbanization.

DECLARATION

I TABE STEPHEN BANDU declare that the effort in this project is my original work and has not been presented to any institution or university for any award

SIGNATURE:

DATE:

APPROVAL

This is to certify that this final project report was under the supervision of;

SUPERVISOR: MR. ENGIRO MARCEL

SIGNATURE

DATE:

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DEDICATION

I dedicate this research to my family especially to my mother, who has supported me throughout my education career

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LIST OF ACRONYMS

BOD – Biochemical Oxygen Demand

DO - Dissolved oxygen

GPS - Global Positioning System

GIS - Geographic Information System

HSPF – Hydrological Simulation Program-FORTRAN pH

- Potential Hydrogen

SDG - Sustainable Development Goal

TP - Total phosphorus

TDS - Total Dissolved Solids

NWSC - National Water and Sewerage Corporation

COD -Chemical Oxygen Demand

TSS -Total suspended solids

TDS -Total dissolved solids

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