BUSITEMA UNIVERSITY
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF WATER RESOURCES ENGINEERING

FINAL YEAR PROJECT REPORT

ASSESSING THE IMPACTS OF MUNICIPAL SOLID WASTES DUMPSITE ON GROUNDWATER QUALITY

CASE STUDY; AMINIT DUMPSITE IN SOROTI CITY

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DECLARATION

I ALUKU SARAH fully declare that the work presented in this research report is my own work except where due references are made. It has not been submitted before for any academic award to any institution of higher learning.

Signature……

Date……

APPROVAL

I certify that the work reported in this research has been written under the supervision of;

NAME: Eng. BAAGALA BRIAN SEMPIJJA AND MR. BAAGOLE CRISTOPHER

Signature……

Date ……

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DEDICATION

I dedicate this final year project report to my mum, uncles and aunties in appreciation of the support offered to me and the effort they put in during my study.

ABSRACT

With increasing population comes the concern for waste disposal. The absence of sanitary disposal methods has left soroti city residents with open dumpsite as their only source of waste disposal. The resulting leachate formed from the decomposition of these waste materials is highly polluted and finds its way to the underground water supply. Gradual accumulations of contaminants in the water sources can result into high loads of pollutants which are potentially toxic to the users. The major aim of this study was to assess the impact of municipal solid wastes dumpsite on groundwater quality within aminit dumpsite since the major source of water for both drinking and domestic use is groundwater. Objectives were, to determine contaminants in groundwater, to evaluate groundwater Quality using water quality Index and to simulate the contaminant flow from the dumpsites to groundwater sources.

The water quality index was determined using National Sanitation Foundation-Water Quality Index (NSF-WQI) method based on eight major water quality parameters pH, water temperature, Electrical conductivity, turbidity, dissolved oxygen, Total Dissolved Solids (TDS), nitrates and fecal coliforms. Water quality index at W1 is 72 (good water), W2 is 97(excellent water), W3 is 65 (poor water), W4 is 62 (poor water), and W5 is 34 (poor water). The low value of Water Quality Index at three wells (W3, W4, and W5) are affected by the high value of temperature, ph. and TDS in W4. low value of dissolved oxygen and high ph in W3 and W5 having too numerous fecal coliforms, high temperature and ph. The study also revealed that the concentration of contaminants from dumpsites to the wells decreases with increase in the distance.

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CHAPTER ONE

2 INTRODUCTION

2.1 Background

Globally, over two billion people worldwide lack access to safe and clean drinking water (WHO, 2017). In a large proportion of developing countries, municipal solid waste (MSW) is disposed simply and unscientifically in various kinds of geological areas, which results in serious environmental and ecological risk to the surrounding water, air and soil. (Funk et al., 2017). According to the World Bank report, it estimates that the generation rate of MSW is expected to increase to 0.7 kg/capital/day and 376,639 tonnes/day by 2025. Of all the environmental concerns that most developing countries face, the lack of adequate, good quality water remains the most serious (Ali, 2012). The practice of landfill system as a method of waste disposal in many developing countries is usually far from standard recommendations. (According to World Bank organization 2019). A standardized landfill system involves carefully selected location, and is usually constructed and maintained by means of engineering techniques, ensuring minimized pollution of air, water and soil and risks to man and animals.

Landfills are properly design to offer a great advantage over the open dumpsites like minimization of environmental issues and reduction of health risks. However, they have been considered to be major contributors to groundwater contamination due to the leakage of solutions from leachate to the ground.

In Africa, Nigeria and most other developing countries, solid wastes are disposed or dumped in open dumpsites, barren lands and many are not properly managed at all. Over many decades, land filling has been favored as a method of waste disposal for a number of reasons, often because it is probably the cheapest available method and also as a result of the availability of holes in the ground. (Igboama et al., 2022). Most of the landfills are open dumping grounds, and they pose serious environmental and health threat to humans (Yusuf et al., 2019). (Igboama et al., 2022). The continuous degradation of groundwater quality by anthropogenic activities from open dumpsites greatly affect its portability. Similarly physicochemical, bacteriological and heavy metal pollution of groundwater has a direct impact on human health which lead to water borne diseases such as typhoid, cholera(O et al., 2011) and Once groundwater becomes

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