FACULTY OF SCIENCE AND EDUCATION

# ASSESSMENT OF FECAL CONTAMINATION AS A RISK FACTOR FOR WATERBORNE DISEASES TO COMMUNITY END-USERS OF OSIA STREAM IN TORORO

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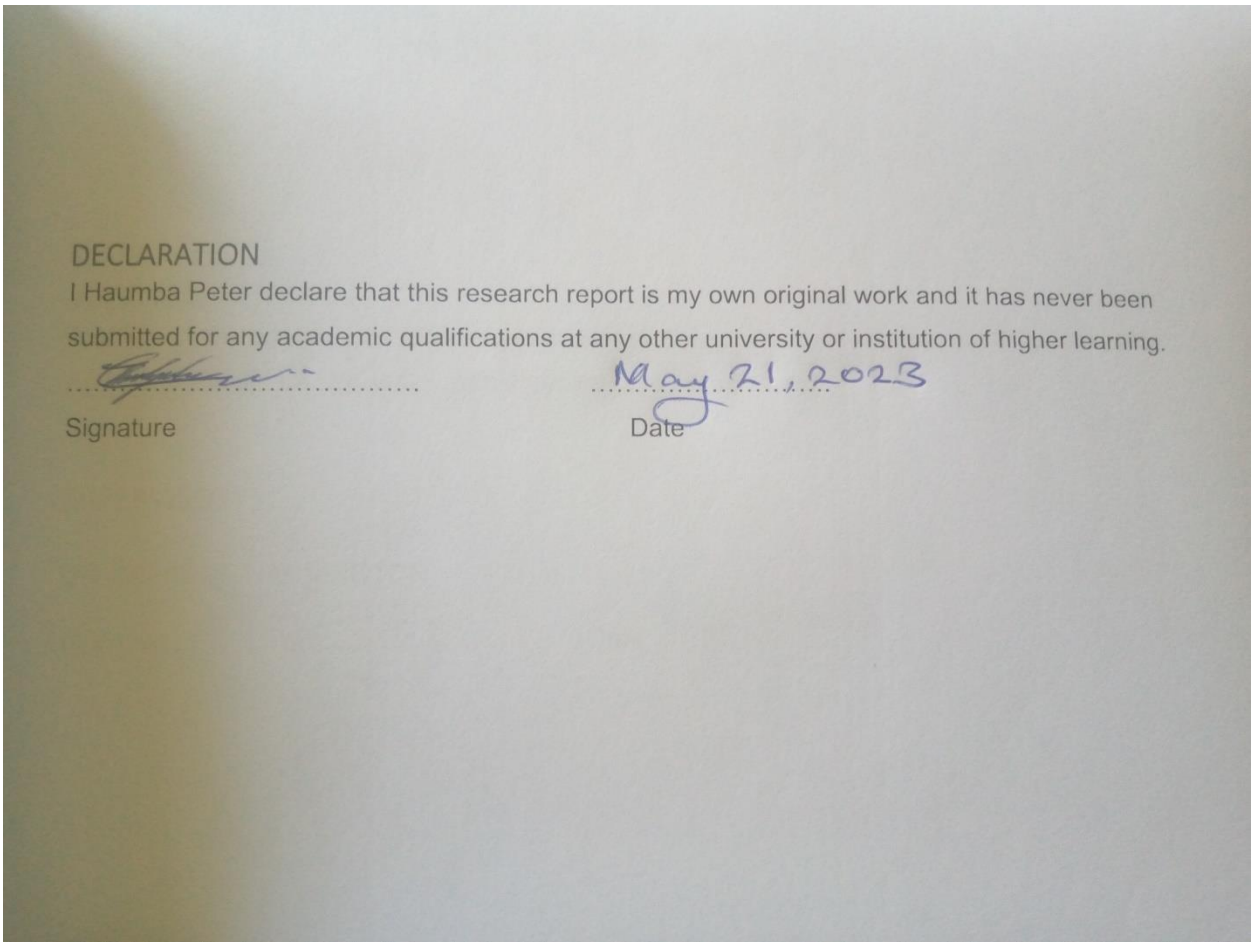
# DECLARATION



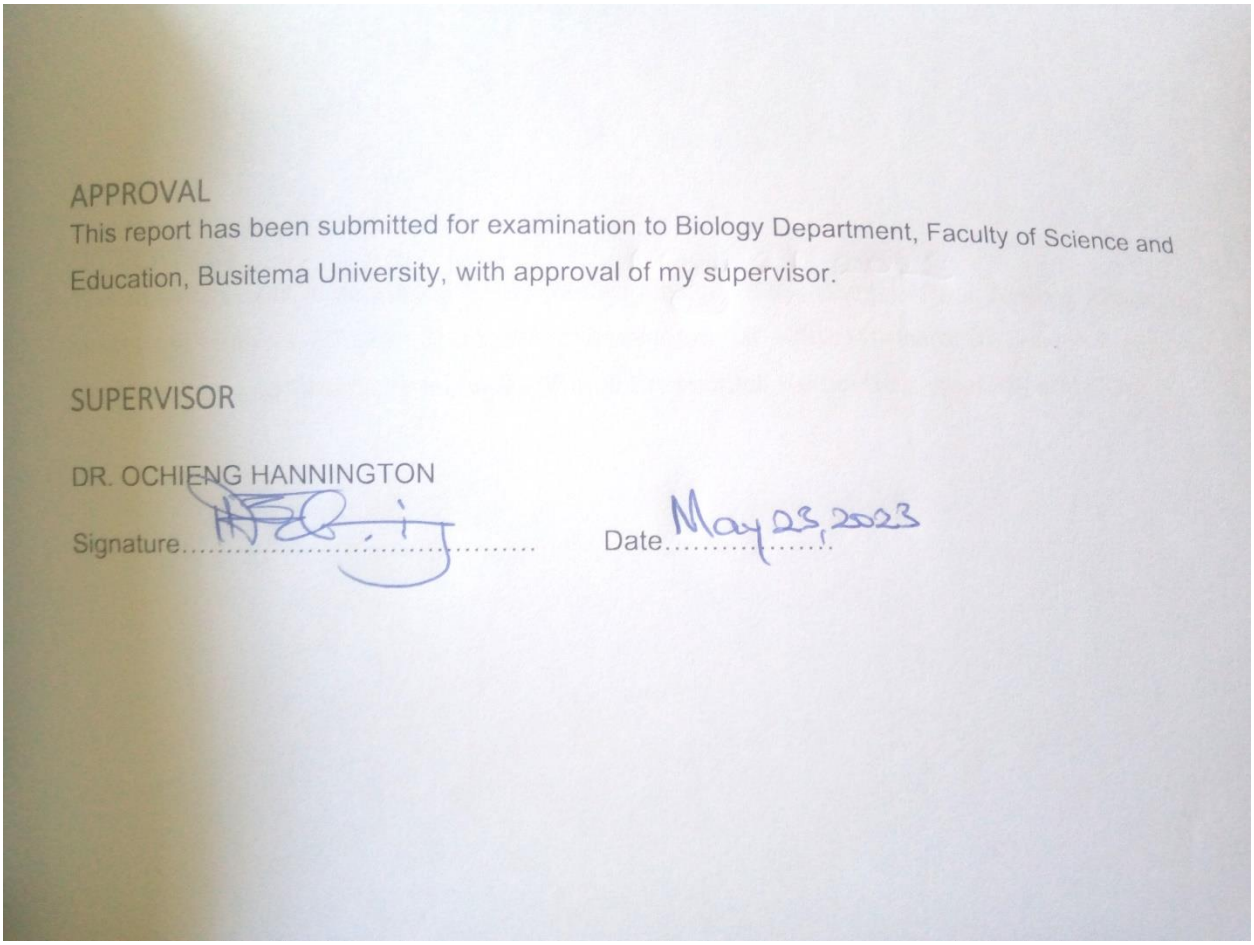
DECLARATION

I Haumba Peter declare that this research report is my own original work and it has never been submitted for any academic qualifications at any other university or institution of higher learning.

.....  May 21, 2023

Signature  Date

## APPROVAL



APPROVAL

This report has been submitted for examination to Biology Department, Faculty of Science and Education, Busitema University, with approval of my supervisor.

SUPERVISOR

DR. OCHIENG HANNINGTON

Signature..... Date..May 23, 2023

## DEDICATION

This research work is dedicated to my mother Nasige Betty, Wanjala Paul, Ndoboli Robert, my sisters and brothers, HESFB, Dr. Ochieng Hannington, Mr. Kifuko Richard, Dr. Joseph F. Hokello, all my Biology and Chemistry lecturers, Wejuli Emmanuel, Kutosi Ivan, my OBs and OGs.

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## ABSTRACT

Fecal bacteria contaminate water resources and result in associated waterborne diseases. This study assessed domestic water quality and evaluated their potential health risks in Osia community, Tororo district. Surface domestic water were randomly collected from downstream to upstream in the Osia stream and analyzed for fecal contamination using fecal indicator bacteria (Escherichia coli) and physiochemical parameters (pH, turbidity, temperature, conductivity, DO and color). The physiochemical parameters were within their safe limits except in a few locations, whereas, the fecal contaminations in domestic water resources exceeded the drinking water quality standards of World Health Organization (WHO), 2011. Site 1 had 9 CFU/100ml of *E. coli* and 4 CFU/100ml of Total coliform, Site 2 had 3 CFU/100ml of *E. coli* and 1 CFU/100ml of Total coliform, Site 3 had 6 CFU/100ml of *E. coli* and 4 CFU/100ml of Total coliform. Site 1 had the most contaminated waters whereas site 2 was the least contaminated with *E. coli* and Total coliform bacterial organisms. The community members of Osia are therefore recommended to boil the water for domestic use especially for drinking to prevent water related illnesses like diarrhea, and typhoid fever. Further research is also recommended to determine the prevalence of waterborne diseases in Osia community.

## ABBREVIATIONS AND ACRONYMS

WHO – World Health Organization.

UNBS – Uganda National Bureau of Standards

FAO – Food and Agriculture Organization.

USEPA – United States Environmental Protection Agency

WBD – Waterborne Diseases

E-coli – Escherichia coli

NWSC – National Water and Sewage Cooperation

FIB – Fecal Indicator Bacteria.

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# INTRODUCTION:

## Background

Water is the main component of the environment. Drinking water is the most indispensable natural resource essential for human life and health on earth (Raji & Ibrahim, 2011). However, World Health Organization (WHO) documented that more than one billion people worldwide do not have access to safe drinking water (Organization, 2010). Therefore, water is also an efficient medium in the transmission of diseases, such as diarrhea, dysentery, typhoid fever, cholera, among others. Recently, most underdeveloped and developing countries have set reduction of waterborne diseases and development of safe water resources as their major public health goal which has slightly improved the situation (Li & Wu, 2019). However, the situation is far from perfect, rural areas in particular, and the slightly improved situation observed may even be damaged by the increased demand of water and reduction of water availability due to population growth and economic development (Li P & H, 2018). The growing imbalance between supply and demand could have led to chronic shortages and competition that have resulted in pollution and environmental degradation (Li & Wu, 2019). It is reported that 4.6% of global disability-adjusted life-years (DALYs) and 3.3% of global deaths is related to water quality (Li & Wu, 2019). Millions of people die from waterborne diseases every year all over the world (Nyagwencha, Kaluli, Home, & Hunja, 2012). According to research, 50% of global diseases are caused by contaminated drinking water (Wen *et al*., 2020). The presence of coliform bacteria in drinking water indicates the existence of a pathway for microbial organisms. Coliform bacteria occur naturally in the environment. If a water test indicates the presence of coliform bacteria, the next step is to attempt to identify and eliminate the pathway of contamination. Boiling, chlorination, ultraviolet light, microfiltration, and distillation are treatment options for removing the bacteria. Bottled water is an alternative for drinking and cooking until the problem can be corrected. The poor bacteriological quality of drinking-water has frequently resulted in high incidence of waterborne diseases.

Diseases caused by contaminated water are among the ten most prevalent water borne diseases. Diarrhea, which is transmitted through poor sanitation, hygiene and low water quality, is one of the most prevalent waterborne diseases caused by E. coli bacteria. During 1995/96, the incidence of diarrhea among children below five years of age was 131 per 1,000 children. The mortality rate due to the diarrhea was 0.34 per 1000 children under five years of age, while the case of fatality rate was 2.56 per 1,000. Household drinking water can be obtained from heterogeneous sources which are dependent on several factors such as price, availability, quality, distance to water

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