

**BUSITEMA UNIVERSITY**  
**FACULTY OF NATURAL RESOURCES AND ENVIRONMENTAL**  
**SCIENCES**  
**DEPARTMENT OF NATURAL RESOURCE ECONOMICS**

**AN ASSESSMENT OF THE IMPACTS OF FLOODING ON FISH**  
**PRODUCTION IN RIVER NILE: A CASE STUDY OF NAMASAGALI**  
**SUB-COUNTY**

**BY**

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**BU/UG/2018/4115**

**A research Report submitted to Busitema University, Namasagali Campus in  
partial fulfillment of the requirements for the award of Bachelor Degree in  
Natural Resource Economics.**

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## DECLARATION

I TUMWEBAZE JOSEPHINE, vow that this research Report submitted to the Faculty of Natural Resource and Environmental Sciences is my original work and to the best of my knowledge, it has not been submitted by any other person to any institution for the award of a degree or any other purposes.

Signature..... Date...../...../.....

TUMWEBAZE JOSEPHINE

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## **DEDICATION**

I am pleased to dedicate this research thesis to all the students of the Faculty of Natural Resources and Environmental Sciences, Namasagali Campus, Busitema University in particular, Akorebirungi Rose, Tusiime Pauline, Ninshaba Agatha, Sentongo Oscar, and Andinda Daisy as a special encouragement to sum up for their efforts towards accomplishment of their degrees amidst the challenging Covid-19 Pandemic that has frustrated education sector in Uganda.

I would also like to dedicate this thesis to my dear loved parents, particularly my father Mr. Kabagambe Yafesi, relatives and friends who offered me a lift all through my education in terms of advice, financial and material support.

## **APPROVAL**

This is to certify that TUMWEBAZE JOSEPHINE REG No. BU/UG/2018/4115 has submitted this research to Busitema University, Faculty of Natural Resources and Environmental Sciences for consideration; as her research which bid as a partial fulfillment for a Bachelor of Science degree in Natural Resource Economics.

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**DATE:** .....

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## **ABSTRACT**

Flooding is a major disturbance that impacts aquatic ecosystems and the ecosystem services that they provide. Thus, the present study aimed to assess the impacts of flooding on fish production in Victoria Nile, Namasagali sub-county. Three landing sites were considered for data collection and these included: Kabeto, Kalama and Nsangabiyire. Questionnaires, field interviews and on-site observation were methods used to collect data for species richness, abundance and diversity as well as existing fisheries management methods for a period of two months from January to March. Results revealed that species richness and abundance were generally higher before flooding than after flooding. Nevertheless, species diversity was higher after flooding than before flooding. Furthermore, fish biomass was higher after flooding than before flooding attributed to increase in nutrients in water from watershed thus increasing biomass after flooding. The major fishery management option in Namasagali was adoption of legal fishing gears which accounted for 76.1%. Given the lower fish biomass recorded in this study than that given in literature, it is concluded that measures to control future flooding River Nile like wetland restoration, conservation and management should be adopted.

## **LIST OF ACRONYMS/ABBREVIATIONS**

ABI :	Advanced Baseline Imager
BMUs:	Beach Management Units
FNR:	Faculty of Natural Resources and Environmental Sciences
GOES-R:	Geostationary Operational Environmental Satellite-R
IPCC:	Intergovernmental Panel on Climate Change
MAAIF:	Ministry of Agriculture Animal Industry and Fisheries
MoWE:	Ministry of Water and Environment
NRE:	Natural Resource Economics
REG No:	Registration Number
UNFCC:	United Nations Framework Convention on Climate Change.

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# CHAPTER ONE

## INTRODUCTION

### 1.1. Background of study

Flooding is a major disturbance that impacts aquatic ecosystems and the ecosystem services that they provide (Talbot et al., 2018). Floods occur when low-lying areas that are typically dry become temporarily inundated with water outside of their normal confines (Talbot et al., 2018).

According to GOES-R (2022), floods can be due factors like heavy rains, snow, ice and glacial melting. Furthermore, floods can be due to ice jams, dams or levees breaking areas near rivers. Additionally, urban areas are also at higher risk for floods since rooftops funnel rainfall to the ground below, and paved surfaces such as highways and parking lots prevent seepage of storm water into the ground (GOES-R.,2022). Several authors have documented the impact of floods on fish production. For instance, fish community structural indices had declined in the six years preceding the flood, with species richness and diversity decreasing from 25 to 22 and 4.56 to 3.48 respectively (Carlson et al., 2016). FOA (2015) states other impacts of flooding such as loss of fish, migration of some fish species to other locations. In a study carried out by Franssen et al., (2006), because of higher discharge and bed scouring at the downstream site, it is predicted that the fish assemblage would have lowered species richness and abundance following floods. In contrast, there was expected increase in species richness and abundance at headwater sites because floods increase stream connectivity and create the potential for colonization from downstream reaches (Franssen et al., 2006). Nevertheless, flooding can also provide many benefits, including recharging groundwater, increasing fish production, creating wildlife habitat, recharging wetlands, constructing floodplains, and rejuvenating soil fertility (Talbot et al., 2018). Thus, the effects of flooding on aquatic ecosystems can be both negative and positive (Talbot et al., 2018). Despite the documented negative impacts of flooding on fish productivity, most studies were conducted, in temperate regions. To mention a few, United States of America (Slater and Villarini, 2016), Luxembourg (Meyer et al., 2021), and The Netherlands (Klijn et al., 2018). Recently, most countries are experiencing the impacts of change such as the floods that hit Uganda in 2020. For the case of Namasagali areas along the river Nile, flooding has been on an increase in the previous few years leading to impacts such as destruction of infrastructure, loss of lives, property and increase in the number of aquatic weeds and siltation in the river. However, such studies about the

impacts of floods on fish productivity in tropical regions and Uganda in particular are still lacking. Yet, this could be important for providing information to fisheries and environmental managers in improvising methods for flood control and management in the fisheries sector.

## **1.2 Problem Statement:**

Flooding is a natural disaster that occurs as a result of increase in the water level beyond the retention capacity of an area. This is through the heavy rains, snow melting and glacial wash down. Climatic change impacts are believed to increase frequency of occurrence of floods (Chukwu., 2015)

Flooding affects the water morphology by retorting most of its physical, chemical and biological properties desired by some fish species for good health, nutrition, reproduction and nursing of juveniles, or even escape predation induce environmental changes (e.g., greater habitat and resource availability) that can stimulate fish productivity and increase species abundance, richness, evenness, and diversity compared to stable flow regimes (Carlson et al., 2016). This is due to large woody debris entrained in flood waters that causes problems in riparian corridors and alters water channels` temperature and sediment composition thus causes species to leave their local habitat, reducing biodiversity and density (Gholizadeh, 2021).

Namasagali experiences many setbacks that resulted from environmental hazards, some being natural and others man-made. One of the most prominent natural hazards is flooding of River Nile in the Namasagali catchment among others that was experienced in the year 2020 although not yet ascertained in Ugandan context. According to (Talbot et al., 2018) flooding is purported to impact on the fisheries production. However, it is not clear if such effects are too manifested in the areas around the Namasagali community, which is the main aim of the present study.

## **1.3 Research Objectives**

### **1.3.1. Main Objective**

To assess the impact of historic flooding in the Victoria Nile in 2020 on fish production in Namasagali sub county

### **1.3.2. Specific Objectives**

- To determine species richness, abundance and diversity after the flooding event,

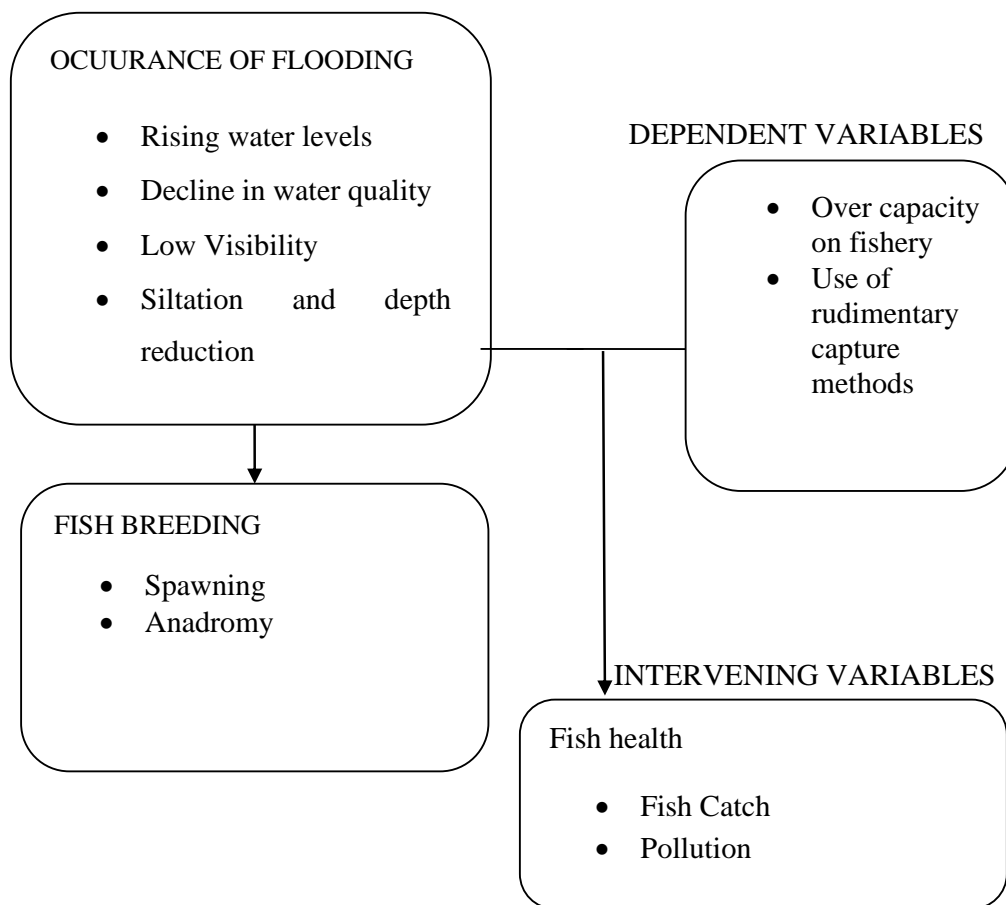
- To evaluate fish biomass landed after flooding and
- To suggest effective fishery management options for the Victoria Nile in Namasagali sub-county.

#### 1.4. Research Questions

- Which fish species are landed in Namasagali Sub County from Victoria Nile?
- What is the abundance and diversity of these species?
- What is the quantity of fish landed in Namasagali Sub County?
- Which management options can be adopted for sustainable fishery management?

#### 1.5. Conceptual frame work

##### INDEPENDENT VARIABLES



#### 1.6 Significance of the research:

Results of this research will help District Fisheries Officers of Kamuli and the neighboring districts, Fisheries Research Institutions, Non-governmental Organizations in identifying the

problems and solutions resulting from floods and further studies on the impacts of floods on aquatic life. The information can also help to guide in policy implementation. This is because; it provides information given by stake holders (fishing community) who have a stake in policy formulation and implementation process.

### **1.7 Limitations of the study**

The study was only limited to three landing sites in Namasagali hence; data collected may not be a representative of what is captured in the whole of Victoria Nile.

Unwillingness to disclose some information. The study faced a challenge of respondents not willing to disclose some information like how much fish they catch and gears used if they know that they are illegal methods since their gears greatly also contribute to unsustainable utilization of the fishery.

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