



FACULTY OF NATURAL RESOURCES AND ENVIRONMENTAL SCIENCES

ASSESSING THE EXISTING WATER RESOURCE MANAGEMENT STRATEGIES FOR MITIGATING FLOODING ALONG RIVER NYAMWAMBA IN KASESE MUNICIPALITY, KASESE DISTRICT

BY

BWAMBALE BRIAN KATHINA

BU/UP/2021/0444

A RESEARCH REPORT SUBMITTED TO THE FACULTY OF NATURAL RESOURCES AND ENVIRONMENTAL SCIENCES IN PARTIAL FULLFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A DEGREE IN BACHELORS OF SCIENCE IN NATURAL RESOURCE ECONOMICS OF BUSITEMA UNIVERSITY.

SEPTEMBER, 2024

DECLARATION

I **BWAMBALE BRIAN KATHINA**, solemnly declare and affirm that the creation and production of this work has been by the combined effort and has never been presented to any institution of higher learning for any academic / research award.

BWAMBALE BRIAN KATHINA

BU/UP/2021/0444

DATE

APPROVAL

This report has been submitted following a comprehensive and holistic assessment as a true copy for consideration by our university supervisor.

Ms. ARIANGO ESTHER.



(SUPERVISOR)

Date



DEDICATION

This work is dedicated to everyone who has supported me in my academic journey more especially my parents; Mr. Maate Abel Kabanghi and Mrs. Nyangoma Florence, my siblings, well wishers as well as my friends and course mates who were always there when I needed help throughout this journey.



ACKNOWLEDGEMENT

I extend sincere appreciation to the Almighty God who started my education journey and has brought me this far, providing me with knowledge, wisdom and understanding as well as enabling me to go through all the challenges during my academics.

In addition, I would like to greatly thank my family and relatives, especially my parents Mr. Maate Abel Kabanghi and Mrs. Nyangoma Florence for the financial assistance and always supporting, encouraging and never giving up on me. All this parental care and guidance enabled me to successfully complete my studies. Also, my siblings and relatives who have always prayed for me and also gave in their full support to parents to sell off some assets we had to cater for my studies. GOD BLESSES YOU ALL!

Furthermore, I extend my sincere gratitude to my dear supervisor Ms. Ariango Esther, for her guidance and words of encouragement in the successful development of this research report. Also, not forgetting the tireless efforts of the entire academic staff that provided us with knowledge and did not give up on us.

Lastly, my appreciation also goes to my fellow course mates for they have played a vital role in my success as we walked this journey as a family and did not leave me behind. May the Almighty God reward them abundantly?

TABLE OF CONTENTS

DECLARATION	ii
APPROVAL	3
DEDICATION	4
TABLE OF CONTENTS	6
LIST OF TABLES	10
LIST OF ACRONYMS	11
ABSTRACT	12
CHAPTER ONE	13
1.0 INTRODUCTION	13
1.1 Background of the Study	13
1.2 Problem Statement	15
1.3 Justification of the Study	15
1.4 Scope of the Study	15
1.5 Main Objective	16
1.6 Specific Objectives	16
1.7 Research Questions	16
CHAPTER TWO	17
2.0 LITERATURE REVIEW	17
2.1 Introduction	17
2.2 Existing Literature on Water Resource Management Strategies for Mitigating Floods along Riverine Systems	17
2.2.1 Hydrological Modeling and Flood Prediction	17
2.2.2 Land-use Planning and Floodplain Management	18
2.2.3 Early Warning Systems and Flood Response	18
2.2.4 Community Engagement and Participation	18
2.3 Forms of Water Resource Management Strategies for Mitigating Floods for Riverine Systems	19
2.3.1 Riparian Vegetation and Wetland Restoration	19
2.3.2 Floodplain Reconnection and Channel Naturalization	19
2.3.3 Flood Control Infrastructure: Dams and Reservoirs	20
2.3.4 Levees and Flood Walls	20
2.4 Causes of Flooding	21
2.4.1 Climate Factors	21



3.10 Limitations of the Study	28
3.11 Conceptual Framework	29
CHAPTER FOUR	30
4.0 PRESENTATION, INTERPRETATION AND DISCUSSION OF FINDINGS	30
4.0.1 Introduction	30
4.0.2 Descriptive Statistics	30
4.1 Objective One	31
General Presentation Of Respondents' Bio-Data, Causes Of Flooding And The Effects Of Floods In T he Study Area	31
4.1.8.1 Causes of flooding along River Nyamwamba, situated in Kasese District, Western Uganda	39
4.1.10 Impacts of flooding along River Nyamwamba, situated in Kasese Municipality, Kasese District advanced by the study participants	44
4.2 Objective Two	49
The Existing Water Resource Management Strategies For Mitigating Floods Along River Nyamwamba Perceived In The Study Area	49
4.2.1 Respondents who agreed to have observed any Water Resource Management Strategies implemented	49
4.2.3 Strategies for mitigating flooding along River Nyamwamba in Kasese Municipality advanced by the study participants:-	51
4.3 Objective Three	53
Challenges Facing The Existing Water Resource Management Strategies, Participants' Perception Towards These Strategies	53
4.3.1 Overview of the existing Water Resource Management strategies implemented for mitigating flooding along River Nyamwamba in Kasese Municipality	53
4.3.2 Respondents perceptions towards the challenges limiting effective implementation of Water Resource Management Strategies along River Nyamwamba	55
CHAPTER FIVE	56
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	56
5.0 Introduction	56
5.1 Summary of Data collection	56
5.3 Summary of Data Analysis	56
5.4 Summary of Main Findings	57
5.5 Study Conclusions	58
5.6 Study Recommendations	59
REFERENCES	61

APPENDICES	64
Appendix 1: Interview Guide	69
Appendix 3: A photograph of the Researcher at River Nyamwamba, in Kasese Municipality, Western Uganda known for its occasional flooding.	70
Appendix 4: Research Procedure	71
Chapter Five: Summery Conclusions And	71
Appendix 5: The researcher's budget operated onto.	72

LIST OF FIGURES

Figure 1: Showing the Gender of Respondents	28
Figure 2: Showing the Age bracket of Respondents	29
Figure 3: Education Levels of Respondents	30
Figure 4: Showing number of years spent in the study area by Respondents	31
Figure 5: Showing the Marital Status of the Respondents	33
Figure 6: Showing frequency of Flood experience or witnessed by respondents	33
Figure 7.: Showing the severity of the Floods experienced by the respondents	34
Figure 8: Showing the causes of floods along River Nyamwamba in Kasese Municipality	35
Figure 9: Showing the Impacts of floods on the Community and the Environment in the affected areas	41
Figure 10: Showing responses of participants pertaining different Water Resource Management Strategies they had observed in the study area	48

LIST OF TABLES

Table 1: Showing selected areas often affected by floods	23
Table 2: Showing the Respondents who agreed to have observed any Water Resource Management Strategies implemented in the study area	45
Table 3: Time Framework	70
Table 4: Showing the Researcher's Budget Operated onto	70

LIST OF ACRONYMS

NRE	Natural Resource Economics
KDLG	Kasese District Local Government
KMC	Kasese Municipal Council
MoWE	Ministry of Water and Environment
WWF	World Wildlife Fund for Nature
IPCC	Intergovernmental Panel on Climate Change
IWRM	Integrated Water Resource Management
FAO	Food and Agricultural Organization
UBOS	Uganda Bureau of Statistics
UNHS	Uganda National Household Survey
UN	United Nations
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries

ABSTRACT

This study assessed the Existing Water Resource Management Strategies for Mitigating Flooding along River Nyamwamba in Kasese Municipality, Kasese District. The following objectives guided the study: i) to identify the existing Water Resource Management strategies implemented for mitigating flooding along River Nyamwamba in Kasese Municipality, ii) to identify the challenges of the existing Water Resource Management strategies for mitigating flooding along River Nyamwamba in Kasese Municipality, iii) to examine the perceptions of local communities towards the existing water resource management strategies for mitigating flooding along River Nyamwamba in Kasese Municipality.

A mixed-methods research design was used for this study. This design combined both qualitative and quantitative research methods to provide a comprehensive understanding of the existing Water Resources Management strategies for flood mitigation along River Nyamwamba in Kasese Municipality. The qualitative component allowed an in-depth exploration of stakeholders' perspectives, experiences, and perceptions, while the quantitative component provided empirical data on flood characteristics, hydrological parameters, and the effectiveness of management strategies. A total sample of 650 respondents was reached for the information with a random of 50 respondents each from different households from well-known areas that have occasionally been hit by floods in all the three divisions of the municipality. The study used simple random and purposive sampling to select the participants. Questionnaire, interview guide and observation methods were used to collect data. Data was collected from different villages and underwent different processing stages of editing, organizing and coding. And later analysed using the Statistical Package for Social Scientists (SPSS) version 21 for easy interpretation of the findings.

The study found out that there was conflict / limited acceptance of some government projects in Kasese Municipality for fear of government grabbing their land. Whenever, government tried to plant Bamboo along the river banks to contain flood waters, the local natives up-rooted them. Community members were anxious that the government had plans of evicting them from their settlement and they were also suspicious of losing their properties to government to have come up with a strategy to fight massive flooding and help the community as result there was limited acceptance some government projects in Kasese Municipality for fear of government grabbing their land.

CHAPTER ONE

1.0 INTRODUCTION

This chapter in this research majorly presents the introduction of the study, background of the study, problem statement, and purpose of the study, specific objectives, and research questions, scope of the study, significance of the study and definition of operational terms.

1.1 Background of the Study

A water resource refers to any of the entire range of natural water stocks that occur on Earth, regardless of their state (i.e., vapour, liquid, or solid), and that are of potential use to humans' wellbeing, ecosystem services, economic development, and the maintenance of biodiversity with ecological integrity (UNESCO/IHP, 2011). These resources include the waters of the seas, oceans, rivers, lakes, and underground waters found in the top layers of the earth's crust and soil cover (Britannica, 2024). Current estimates are that the earth's hydrosphere contains about 1386 million cubic kilometres of water. However, 97.5% of this amount is saline waters, and only 2.5% is fresh water. The greater portion of this fresh water (68.7%) is in the form of ice and permanent snow cover in the Antarctic, the Arctic, and in the mountainous regions. 29.9% exists as fresh groundwater, and only 0.26% of the total amount of fresh waters on the Earth are concentrated in lakes, reservoirs and river systems where they are most easily accessible for our economic needs and absolutely vital for water ecosystems, hence making fresh water very scarce for humans. (Shiklomanov, 1998)

Water Resource Management (WRM) is the process of formulating and implementing plans, policies, and strategies to effectively and efficiently manage water resources at the local, regional, and national levels (Stockholm, 2009). It includes treatment of drinking water and industrial water, management of flood protection and discharges, and management of irrigation, and the water table (Rickson, 2009). However, it is likely that ongoing climate change will lead to situations that have not been encountered and as a result, alternative management strategies, including participatory approaches and adaptive capacity are increasingly being used to strengthen Water Resource Management decision making (George Tsakiris, 1987). Furthermore, climate change is redistributing where water is rare and where it is plentiful making some regions more prone to drought conditions where as other regions hit by frequent flooding hence making Management of Water Resources increasingly important (Troy Adams, 2021).

Floods are in recent times being experienced with increased frequency and devastating i