ASSESSING THE LAND USE LAND COVER DYNAMICS USING TRENDS EARTH

A CASE FOR KATONGA CATCHMENT

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A RESEARCH REPORT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A DEGREE OF BACHELOR SCIENCE IN NATURAL RESOURCE ECONOMICS BUSITEMA UNIVERSITY

DECLARATION

I NAKYANZI LATIFAH registration number BU/UG/2020/1927 hereby declare that the research work entitled 'Assessing the Land Use Land Cover Dynamics Using Trends Earth: A Case Study for Katonga Catchment' is my original work and has not been submitted for any other degree or diploma at any university. The research was conducted under the supervision of Professor Isabirye Moses, as a partial fulfillment of the requirements for a bachelor's degree in Natural Resource Economics at Busitema University. I affirm that all sources used in this research have been duly acknowledged and referenced and the intellectual content of this research is the product of my own work and take full responsibility for any errors or omissions in this research.

Signature; ……. Date; ……

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APPROVAL

This is to satisfy that **Nakyanzi Latifah** registration number **BU/UG/2020/1927** has done this research under my close supervision and therefore this report is ready for submission.

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DEDICATION

This report is dedicated to the pillars of my support and the driving forces behind my academic journey, my beloved parents, Naluwooza Annet and Kakooza Muhammad. Your unwavering love, sacrifices, and encouragement have been the bedrock of my accomplishments.

To my dearest friends and coursemates, Namuyanja Rebecca, Neumbe Hope, and Otigo Moses, along with all my course mates, your camaraderie and shared experiences have added immeasurable value to this academic adventure. Together, wacknowledgementhallenges, celebrated victories, and grew as a collective force.

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Last but not least, this report is a reflection of my dedication and perseverance. It symbolizes the countless hours of hard work, self-discovery, and the relentless pursuit of knowledge. May it stand as a testament to the collective efforts and support of those who have played a pivotal role in my academic journey.

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LIST OF ABBREVIATIONS

CBWRM ……. Catchment Based Water Resources Management

CMP ……Catchment Management Plan

CMU……. The Catchment Management Unit

COBWEB ……Community-Based and Wetland Biodiversity

DPSIR ……. Drivers, Pressures, State, Impact, Response

DWRM ……Directorate of Water Resources Management

EIA ……. Environmental Impact Assessment

FIEFOC ……...Farm Income Enhancement and Forest Conservation

GIS ……. Geographic Information System

IPCC ……International Panel on Climate Change

LULC ……. Land Use-Land Cover

LULCC…… Land Use-Land Cover Changes

MOU ……. Memoranda of Understanding

MWE ……...Water and Environment

NEMA ……. National Environmental Management Authority

NGOs ……. Non-Government Organizations

NRE ……Natural Resource Economics

Q-GIS ……. Quantum Geographic Information System

SDG ……Sustainable Development Goals

SIDA ……...Swedish International Development Agency

UN ……. United Nations

USAID ……. United States Agency International Development

ABSTRACT

The Katonga catchment is one of the major catchments in Uganda that runs with in the districts of Kalungu, Bukomansimbi, Mpigi, Lwengo, Mubende, Ssembabule, Kamwenge, Kazo, Gomba, Mityana, Kassanda, Lyantonde, Kiruhura, Masaka, Kyotera and Butambala and is served by river Katonga and its tributaries, it's covered by wetlands, lakes, forests, grasslands, built-up areas, agricultural fields, and barren lands. This study explores the land use and land cover dynamics of the Katonga catchment in Uganda over a two-decade period from 2001 to 2021. The study aims to analyze the changes in land use and land cover patterns within the catchment area, considering factors such as urbanization, agricultural expansion, deforestation, and natural resource management. Remote sensing data and geographic information systems (GIS) techniques are employed to assess the spatial and temporal changes in land use and land cover. The findings provide valuable insights into the evolving landscape of the Katonga catchment, offering essential information for sustainable land management, environmental conservation, and decision-making processes.

The study also investigates the drivers behind these changes, including human activities, climate variability, and policy interventions. By examining the dynamics of urban areas, agricultural lands, forests, wetlands, water bodies, and other land cover types, the research sheds light on the transformations occurring within the catchment.

By analyzing the various implications of these land use and land cover dynamics on ecological systems, biodiversity conservation, water resources, and overall environmental sustainability which include loss of biodiversity, soil erosion, loss of water quality among others, It emphasizes the need for integrated land management strategies that balance economic development with ecological integrity like agro forestry, sustainable agriculture, integrated watershed management, strengthening environmental laws and policies, collaboration with various ministries, NGOs, countries to protect the catchment.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Land cover change is defined as the loss of natural areas, particularly the loss of forests to urban or exurban development, or the loss of agricultural areas to urban or exurban development. Land cover change denotes a change in certain continuous characteristics of the land such as vegetation type, soil properties, and so on; whereas land-use change consists of an alteration in the way certain area of land is being used or managed by humans. The land is where most biological and human activity takes place. Both socioeconomic land use and bio geographical land cover are used to account for land. Land cover is the term for the physical and biological covering of land, including plants, water, bare soil, and/or man-made structures. (Parth & Arijit, 2010) The visible surface of the land is referred to as the land cover (e.g., crops, grass, water, broad-leaved forest, or built-up area). The socioeconomic use of a piece of land such as agriculture, forestry, recreation, or residential use is referred to as its land use. (Land Cover and Land Use, n.d.) It is interesting to note that this change is responsible for several local and global effects, including biodiversity loss and its associated effects on human health, and the loss of habitat and ecosystem services. (Erika , et al., 2005). Land cover changes are mostly caused by urbanization and are now crucial for developing and impoverished nations. The dynamics of land use and land cover changes are described, projected, and explained by land change models (LCMs). LCMs are a tool to comprehend how humans have altered the surface of the Earth in the past, present, and future. While land use and its changes require the integration of natural and social scientific methods to identify which human activities are taking place in different parts of the landscape, even when the land cover appears to be the same, the land cover represents the spatial distribution of the different land cover classes on the earth's surface. It can be directly estimated qualitatively as well as quantitatively by remote sensing. (Parth & Arijit, 2010).

A catchment is a hydrological area where all surface water converges to a single exit point at a lower elevation. (CORDAID & Lotukei , 2017).

Uganda's Katonga watershed is home to over forty (40) species of mammals and over one hundred and fifty (150) species of birds of which many of them specific to wetland habitats. They commonly sighted in the wetland reserve are the elephant, waterbuck, reedbuck, colobus monkeys, and river otters and offer a range of ecosystem services like rainfall formation, purification of

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