

UNIVERSITY OF NAIROBI

DEPARTMENT OF DIPLOMACY AND INTERNATIONAL STUDIES

MASTERS RESEARCH PROJECT

**TRANSBOUNDARY NATURAL RESOURCE MANAGEMENT AND DIPLOMATIC
COOPERATION AMONG THE EAC STATES: CASE OF LAKE VICTORIA
BETWEEN KENYA AND UGANDA**

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**A RESEARCH PROPOSAL SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS IN
DIPLOMACY FROM THE UNIVERSITY OF NAIROBI.**

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DECLARATION

Candidate's Declaration


I affirm that this research project is entirely my own work and has not been submitted to any other academic institution for the purpose of obtaining a degree.

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Supervisor's Declaration

I confirm that this research project has been approved by me, as the supervisor of this student, for submission for examination.

Dr. Shazia Chaudhry  ... Date.....23/8/2023.....

DEDICATION

I wish to devote this research project to my family members who have shown immense patience and support throughout my academic journey. These include my father, Ernest Ayoma, my mother, Elizabeth Ayoma, my brothers, Kepha Okoth, Javan Ochieng, and Jared Ogalo, and my sisters, Jemima Adhiambo and Casey Achieng'. Despite the extended periods of time that I have been away from home during the course of this study, they have provided me with unwavering encouragement and understanding. I am grateful for their sacrifices and moral support, and I pray that the Almighty blesses them abundantly.

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LIST OF ABRIVIATIONS

| | |
|---------------|--|
| TBNR | Transboundary Natural Resources |
| SDG | Sustainable Development Goal number |
| AU | African Union |
| ANBO | African Network of Basin Organizations |
| LVBC | Lake Victoria Basin Commission |
| LVFO | Lake Victoria Fisheries Organization |
| UNCED | United Nations Conference on Environment and Development |
| SADC | Southern African Development Community |
| EAC | East African Community |
| UNEP | United Nations Environment Programme |
| LVBC | Lake Victoria Basin Commission |
| BMU | Beach Management Unit |
| CPR | Common Pool Resource |
| IUCN | International Union for Conservation of Nature |
| COMESA | Common Market for Eastern and Southern Africa |
| CBD | Convention on Biological Diversity |
| NEPAD | New Partnership for Africa's Development |
| AMCOW | African Ministries' Council on Water |
| CORB | Cubango-Okavango River Basin |
| OKACOM | Permanent Okavango Basin River Commission |
| CFA | Cooperative Framework Agreement |
| FAO | Food and Agriculture Organization |
| EU | European Union |
| GEF | Global Environment Facility |
| LVFRP | Lake Victoria Fisheries Research Project |
| EADB | East African Development Bank |

| | |
|---------------|---|
| NBI | Nile River Basin Initiative |
| AMISOM | African Union Mission in Somalia |
| NRA | National Resistance Army |
| RCP | Representative Concentration Pathway |
| IPCC | Intergovernmental Panel on Climate Change |
| LVEMP | Lake Victoria Environmental Management Project |
| KWS | Kenya Wildlife Service |
| NWSC | National Wetlands Standing Committee |
| ICIPE | International Centre of Insect Physiology and Ecology |
| KEPHIS | Kenya Plant Health Inspectorate Services |
| MENR | Ministry of Environment and Natural Resources |
| NWP | National Wetlands Programme |
| WSSP | Wetland Sector Strategic Plan |
| NWSC | National Water and Sewerage Corporation NWSC |
| IUU | Illegal, Unreported, and Unregulated |
| RPOA | Regional Plan of Action |

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ABSTRACT

This study explores transboundary natural resource management and diplomatic cooperation among the East Africa Community states. The study does so with a primary focus on Lake Victoria, which is a vital transboundary natural resource shared by both Kenya and Uganda. The research being a case study employs qualitative methodology. It incorporates both primary data collected through administration of questionnaires and interviews with key stakeholders, government officials, and environmental experts and secondary data obtained from publicly available government databases and scholarly publications to complement each other and subsequently enrich the study. The objectives of the study are: to assess the transboundary natural resource management on diplomatic cooperation among the East Africa Community states, to determine and analyze the role played by Transboundary Natural Resources (TBNR) of Lake Victoria in promoting cooperation between Kenya and Uganda and to investigate key challenges experienced in Transboundary Natural Resources Management (TBNRM) of Lake Victoria between Kenya and Uganda. The findings of the study reveal that effective governance of TBNR can foster good diplomatic cooperation and peaceful coexistence between states. The findings further reveal that the TBNRM of Lake Victoria has played a critical role in promoting cooperation and resolving conflicts between Kenya and Uganda. Moreover, Joint efforts under regional organizations and treaties have enabled sustainable use and management of the lake's resources. Finally, according to the study's findings, the effects of climate change, water pollution, the impact of water hyacinth, and the decline of biodiversity and fisheries are among the major challenges faced in the management of Lake Victoria. The study ultimately enriches the existing literature on TBNRM on diplomatic cooperation.

Key words: transboundary natural resources, diplomatic cooperation, East Africa Community

CHAPTER ONE

1.1. Introduction

Transboundary Natural Resource (TBNR) refers to “an element of the natural environment used by man which constitutes a bio-geophysical unit and is located in the territory of two or more states.”¹ Various international organizations and agreements have acknowledged the governance of transboundary resources as a significant challenge, making it a global issue. In 1997, the United Nations General Assembly adopted Convention on the Law of the Non-Navigational Uses of International Watercourses. This agreement establishes a structure for managing water resources that cross international boundaries. The accord emphasizes the importance of cooperation among the riparian states in managing shared water resources and avoiding any harm to other riparian states.² The Sustainable Development Goal number six (SDG6) also aims to ensure availability and sustainable management of water and sanitation for all by 2030. SDG six calls for implementation of integrated water resources management at all levels, including through transboundary cooperation as appropriate. It also recognize the importance of transboundary water cooperation and call for enhanced cooperation and capacity building among developing countries in managing shared water resources.³

The African continent is home to some of the largest transboundary natural resources in the world, including rivers, lakes, and aquifers. The resources play a crucial role in the economic growth and sustenance of livelihoods for the communities in the areas such resources exist. The African Union (AU) recognizes the importance of transboundary natural resource management and has taken

¹ Jaro Mayda, "Definition of internationally shared Natural Resources," United Nations Environment Programme (1978): 7.

² Convention on the Law of the Non-Navigational Uses of International Watercourses, May 21, 1997, 36 I.L.M. 700.

³ UN General Assembly, "Transforming our world: the 2030 Agenda for Sustainable Development," A/RES/70/1 (Oct. 21, 2015).

steps to address the issue.⁴ The AU has established the African Network of Basin Organizations (ANBO), which seeks to enhance cooperation among African nations in the management of water resources that cross international borders. The AU has also embraced the African Convention on the Conservation of Nature and Natural Resources, which provides a framework for safeguarding and utilizing natural resources in the region sustainably.⁵ The governance of transboundary natural resources in Africa however, is fraught with challenges, including inadequate policies and regulations, limited resources, conflicting interests, and lack of coordination among the member states.

In East African region moreover, management of transboundary resources is governed by various agreements, including East African Community Treaty⁶ and the Lake Victoria Basin Commission (LVBC) Protocol. LVBC Protocol provides a legal architecture for governance of Lake Victoria Basin, harmonizing operations between member countries, preserving the lake and its resources, and encouraging sustainable development.⁷ However, implementation of the LVBC Protocol has been challenging due to various factors, including inadequate resources and limited capacity among the member states.

In Kenya and Uganda, Lake Victoria is a vital natural resource that supports various economic activities, including fishing, transportation, and tourism. The two countries have had a lengthy history of cooperation in the governance of the lake, including establishment of Lake Victoria Fisheries Organization (LVFO) in 1994. However, the management of the lake has been

⁴ African Union, "African Network of Basin Organizations (ANBO)," accessed April 9, 2023, <https://au.int/en/organs/anbo>.

⁵ African Union, "African Convention on the Conservation of Nature and Natural Resources," accessed April 9, 2023, <https://au.int/en/treaties/african-convention-conservation-nature-and-natural-resources>.

⁶ East African Community, "The East African Community Treaty," accessed April 19, 2023, <https://www.eac.int/treaty/>.

⁷ Lake Victoria Basin Commission, "Protocol for the Sustainable Development of Lake Victoria Basin," accessed April 19, 2023, <https://lvbc.int/protocol-for-the-sustainable-development-of-lake-victoria-basin/>.

challenging due to various factors, including overfishing, spread of water hyacinth, pollution, and the spread of invasive species. These challenges have resulted in conflicts and tensions between the two countries, particularly over fishing rights and the use of the lake's resources.⁸

This research aims to offer perspectives on transboundary natural resource management on diplomatic cooperation of East African Community states, while focusing on Lake Victoria between Kenya and Uganda. The research does so by answering key questions pertaining to transboundary natural resource management and diplomatic cooperation among the East Africa Community states; role played by TBNR of Lake Victoria in promoting cooperation between Kenya & Uganda; and involvement of global and continental organizations, such as Lake Victoria Basin Commission and East African Community, in addressing transboundary resource management challenges experienced in TBNR of Lake Victoria between Kenya and Uganda. In doing so, the study is premised upon Common Pool Resource Theory and Complex Interdependence Theory.

1.2. Background of the Study

International frontiers are formed based on political considerations rather than ecological considerations. This means that several vital ecological systems and components are divided by these frontiers and may be exposed to varying land use practices and management approaches across borders.⁹ According to Hey, the global focus on managing transboundary natural resources is viewed as an endeavor to pursue a collective interest for the global community in environmental matters.¹⁰ This establishes Transboundary Natural Resource management as a constituent of the

⁸ Lake Victoria Fisheries Organization, "About LVFO," accessed April 19, 2023, <https://www.lvfo.org/about-lvfo/>.

⁹ H. Van der Linde, T. Sand, J. Oglethorpe, with, Y. Tessema, and D. Snelson (with contributions from Thomas Price and Anada Tiega), "Beyond Boundaries: Transboundary Natural Resource Management in Sub-Saharan Africa," (D.C., U.S.A.: Biodiversity Support Program, 2001), 2.

¹⁰ Hey, Ellen. "Global Environmental Law: Common Interests and the Reconstruction of Public Space." *Isturn Aequum Salutare v 2009/1* (2009): 41-57. Cited in Were, Edmond M. "Conflict of Interest in Exploitation and

worldwide strategy that emerged specifically as a result of the idealization associated with the requirement for collaboration in the utilization of shared resources between autonomous states. To realize this goal, global agreements that demonstrate the fundamentals of management of natural resources that cross international borders, such as the Helsinki Regulations concerning usage of international river waters of 1966, the United Nations Convention for protecting Transboundary Water sources and global lakes and the Convention on the Law of the Non-Navigational Uses of International Watercourses, adopted by the United Nations, have been implemented.¹¹ These are binding principles which cut across and apply to all states.

The management of Lake Victoria has not been any different. It has a lengthy history that stretches all the way to the colonial era when the British authorities in Kenya and Uganda established fishing regulations to govern the misuse of the fishery resources in the lake.¹² After independence, the two countries continued to cooperate in the administration of the lake and its resources. In 1994, the Lake Victoria Fisheries Organization (LVFO) was established to promote sustainable management of fisheries in the lake.¹³ However, in the 1990s, the fishery resources in the lake began to decline rapidly due to overfishing and the introduction of exotic species. This led to conflicts between the member states, particularly between Kenya and Uganda, over fishing rights and the use of the

Utilisation of Transboundary Natural Resources on Lake Victoria.” *Journal of African and Conflict Peace Studies* 3, no. 1 (2016): 6. <http://dx.doi.org/0.5038/2325-484x.3.1.1078>.

¹¹ Were, Edmond M. “Conflict of interest in Exploitation and Utilization of Transboundary Natural Resources on Lake Victoria.” *Journal of African and Conflict Peace Studies* 3, no. 1 (2016): 6. DOI: <http://dx.doi.org/0.5038/2325-484x.3.1.1078>.

¹² Munyaho, T., Muhoozi, L., & Ayebare, F. “Transboundary natural resource management in East Africa: The case of Lake Victoria.” *International Journal of Development and Sustainability* 5, no. 11 (2016): 357-370.

¹³ Aloo, P. A., & Othoro, W. K. “Impacts of climate change on Lake Victoria and its water resources: A review.” *Journal of Environmental Treatment Techniques* 7, no. 3 (2019): 369-375.

resources of the lake. Conflicts escalated in early 2000s when Uganda began to introduce cage fish farming, which was perceived as a threat to the traditional fishing communities in Kenya.¹⁴

Over the last few years, there have been some positive developments in the governance of Lake Victoria and resources in it. The LVFO has implemented various measures to promote sustainable fisheries management, including the establishment of closed fishing seasons, minimum size limits for fish, and the promotion of alternative livelihoods for fishing communities.¹⁵ The member states have also undertaken various initiatives to address pollution and the spread of invasive species in the lake. Despite all these efforts however, the administration of Lake Victoria and its resources remain a significant challenge in the region of East Africa. Overfishing, water hyacinth, pollution, and spread of invasive species inter alia continue to impact the lake and its ecosystem, with negative implications on sustenance of the communities that rely on the lake.¹⁶ The conflicts and tensions between Kenya and Uganda over the governance of the lake and its resources have persisted, despite efforts by the LVFO and other regional bodies to promote cooperation and coordination among the member states.¹⁷ This colossal failure to play by the books of LVFO has resulted to harassment of Kenyan fishermen by the Ugandan authorities, deployment of Ugandan naval forces within the Kenyan territory of the lake and Uganda laying claims to the ownership of Migingo Island, all of which have stressed the diplomatic cooperation between Kenya and Uganda.

¹⁴ Munyaho, T., Muhoozi, L., & Ayebare, F. “Transboundary natural resource management in East Africa: The case of Lake Victoria.” *International Journal of Development and Sustainability* 5, no. 11 (2016): 357-370.

¹⁵ Aloo, P. A., & Othoro, W. K. “Impacts of climate change on Lake Victoria and its water resources: A review.” *Journal of Environmental Treatment Techniques* 7, no. 3 (2019): 369-375.

¹⁶ Onyango, P. O., Ochievo, J., & Kairu, A. “Impacts of human activities on the water quality of Lake Victoria: A review.” *International Journal of Scientific Research and Management* 6, no. 5 (2018): 582-593.

¹⁷ Munyaho, T., Muhoozi, L., & Ayebare, F. “Transboundary natural resource management in East Africa: The case of Lake Victoria.” *International Journal of Development and Sustainability* 5, no. 11 (2016): 357-370.

In this regard, efforts are underway to review the policy, legal and institutional frameworks to make governance of transboundary natural resource of Lake Victoria a success.¹⁸ As witnessed, LVFO and LVBC's efforts have not been entirely successful in addressing the challenges, and conflicts over the lake's resources continue to persist. This clearly shows that when not properly managed through diplomatic interventions and cooperation, these resources will continue to exacerbate tensions between Kenya and her neighbors like Uganda.¹⁹

With this context in mind, the research investigates transboundary natural resource management and diplomatic cooperation among the East Africa Community states, with a particular focus on Lake Victoria between Kenya and Uganda.

1.3. Statement of the Research Problem

East Africa Community states have a myriad of aquatic, terrestrial ecosystems and ecological systems which are dissected by their borders. This has subjected the resources to different managements across borders. Lake Victoria which is the main shared transboundary natural resource among three states has had the most complex and challenging task regarding its use and management due to its transboundary nature. Notable instance is 2008 when Ugandan authorities began to assert control over Mbingo Island claiming it was part of their territory, while Kenya claimed it was part of its exclusive economic zone. The dispute escalated into a diplomatic row, with both countries deploying naval forces to the area. Moreover, in 2019 Uganda unilaterally banned fishing on Lake Victoria citing concerns over illegal fishing practices and declining fish stocks. The ban which affected Kenyan and Tanzanian fishermen sparked protests and violence among fishing communities. The dispute was eventually resolved through diplomatic channels,

¹⁸ See East African Community portal, ac.int, for more information.

¹⁹ See Chapter 3: Transboundary issues in UNEP and GEF 2008 p: 67-78

with Uganda lifting the ban and agreeing to work with Kenya and Tanzania to improve fisheries management in the lake.

While there exist policy, legal, and institutional framework for the transboundary natural resource management of Lake Victoria between Kenya and Uganda, the effectiveness of these frameworks remain unclear considering their poor implementation as well as lack of monitoring and evaluation procedures. Furthermore, the role played by transboundary natural resource management of Lake Victoria in promoting cooperation between Kenya and Uganda has been overridden by conflict of interest between the two countries resulting to non-cooperation. Moreover, the key challenges experienced in management of Lake Victoria such as pollution, overfishing, water hyacinth invasion, climate change inter alia have not been adequately investigated and addressed. This scenario has manifested itself so well in Lake Victoria warranting this study.

1.4. Research Questions

This study aims to give answers to the following questions:

1. How does transboundary resource management affect diplomatic cooperation among the EAC states?
2. What is the role played by TBNR of Lake Victoria in promoting diplomatic cooperation between Kenya and Uganda?
3. Which challenges are experienced in TBNR of Lake Victoria management between Kenya and Uganda?

1.5. Objective of the Study

The general objective of this study is to examine transboundary natural resource management on diplomatic cooperation of the East Africa Community states with key focus on Lake Victoria between Kenya and Uganda.

1.5.1. Specific Objectives

The specific objectives of the study are:

1. To assess transboundary natural resource management on diplomatic cooperation among the EAC states.
2. To determine and analyze the role played by TBNR of Lake Victoria in promoting diplomatic cooperation between Kenya and Uganda
3. To investigate key challenges experienced in TBNR of Lake Victoria management between Kenya and Uganda

1.6. Literature Review

This section presents an analysis of both theoretical and empirical literature relating to potency of TBNR management on diplomatic cooperation of East Africa Community states. Being an area of concern in the recent years, by using some of the relevant TBNR theories, this section will examine the key debates revolving around the subject herein as presented by scholars and various experts in this particular area of study. With the aim of establishing the knowledge lacuna around this debate, this section presents a detailed analysis of the literature presented by other scholars. Finally, a theoretical framework showing the interrelationship among the variables is given.

1.6.1. Theoretical Literature Review

To aid in the analysis of key debates by diverse scholars in the domain of TBNR, the research has contemplated the use of theoretical review. The theories reviewed are Common Pool Resource Theory and Complex Interdependence Theory.

1.6.1.1. Common Pool Resource Theory

The concept of Common Pool Resource theory traces its origin to the 19th century from the works of renowned scholar William Forster Lloyd, a Victorian economist in 1833. Lloyd believed that

humans were inherently rational and driven by self-interest. He argued that when individuals focus solely on improving their own lives, it could result in negative consequences for everyone.²⁰ Lloyd used the example of a person adding more cattle to their own land, resulting in a deduction from the subsistence consumed, which in turn benefits no one. Conversely, if the same person added cattle to a common area, the total amount of food consumed would be deducted from all cattle would be minimal compared to the total resources taken, which would be proportionate to their population size. Lloyd proposed that there is a point of saturation for enclosed pastures, where no prudent person would add more stock beyond that point. Similarly, there is a point of saturation for commons.²¹

In 1968, Garrett Hardin, an American ecologist, expanded on Lloyd's idea and called it "The Tragedy of the Commons." Hardin argued that if individuals prioritize their personal interests, it could potentially conflict with the collective interests of the group, resulting in the depletion of common resources.²²

The concept of Common Pool Resource Theory builds on these early works of Lloyd and Hardin. Its key proponent is a political scientist from Indiana University named Elinor Ostrom. In her book "Governing the Commons: The Evolution of Institutions for Collective Action" authored in 1990, Ostrom examined how communities around the world have successfully managed shared resources, despite the potential for overuse and depletion. She argued that successful management

²⁰ "What is the Tragedy of the Commons?" (2019). Economy. Retrieved from <https://www.ecnmy.org/learn/your-economics/economic-glossary/what-is-the-tragedy-of-the-commons/>

²¹ W. F. Lloyd, Two Lectures on the Checks to Population. 1833, quoted in Charles C. Anukwonke, "The Concept of Tragedy of the Commons: Issues and Applications," ResearchGate (2015): 2-3.

²² Ibid.

of CPRs depends on the creation of institutions that balance the needs of users while ensuring the resource are sustained over the long term.²³

However, the theory of common pool resource has faced criticism and debates. Some scholars argue that CPR theory puts too much emphasis on the ability of local communities to self-govern and manage shared resources. They argue that self-governance may not always be effective, particularly in situations where there are power imbalances or conflicts of interest among users. Some scholars also say that CPR theory sometimes neglects the role of external factors such as market forces, globalization, and climate change, which could greatly affect how shared resources are managed. Finally, some scholars argue that CPR theory can be overly complex and difficult to implement in practice. This is particularly true in situations where there are multiple stakeholders with conflicting interests, or where the resource in question is difficult to monitor or regulate.²⁴

1.6.1.2. Complex Interdependence Theory

Two prominent proponents of complex interdependence theory are Robert Keohane and Joseph Nye, who advanced the proposition in their book "Power and Interdependence". The theory emerged as a response to the limitations of realism in explaining the changing global context, particularly the increasing complexity and diversity of international actors and issues.²⁵

According to complex interdependence theory, states are not the only relevant participants in international relations. Other actors, such as multinational corporations, non-governmental organizations, and international institutions, have become increasingly important in shaping international outcomes. The theory also emphasizes that there are multiple channels of

²³ Ostrom, Elinor. *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press, 1990.

²⁴ Johnson, C., "The Challenges of Implementing the Theory of Common Pool Resources in Practice." *Public Administration Quarterly*, 2012. 36(2), 245-259.

²⁵ Robert Keohane and Joseph Nye, *Power and Interdependence* (Boston: Little, Brown and Company, 1977), 1-17

communication and interaction between states, beyond traditional diplomatic channels, such as trade, investment, and cultural exchange.²⁶

Complex interdependence theory moreover, suggests that military force is not the only, or even the most important, form of power in international relations. Economic, cultural, and ideological forms of power are also significant, and can be used to influence the behavior of other actors. In this way, cooperation and negotiation are seen as key components of international relations, rather than simply the quest of self-interest and the use of force.²⁷

The weakness of complex interdependence theory is that it may not fully account for power imbalances between actors. Critics argue that the theory assumes that all participants have the same level of access to the available resources and decision-making power, which may not be the case in practice. Additionally, the theory may not adequately address the role of ideology and nationalism in shaping state behavior, and may underestimate the importance of military force as a tool of statecraft.²⁸

1.6.2. Empirical Literature Review

This section examines relevant literature in relation to the following objectives, to assess transboundary natural resource management on diplomatic cooperation of the East Africa Community states, to determine and analyze the role played by TBNR of Lake Victoria in promoting cooperation between Kenya and Uganda, and to investigate key challenges experienced in TBNR of Lake Victoria management between Kenya and Uganda.

1.6.2.1. Transboundary Natural Resource Management and Promotion of Diplomatic cooperation.

²⁶ Ibid.

²⁷ Ibid.

²⁸ Ibid.

According to Carroll, international cooperation in a world governed by nations can be achieved by the disposition and ability of national governments to make and honor treaties.²⁹ In light of this, Razzaque posits that the issue of transboundary resources governance is typically addressed through three types of treaties: international legal frameworks, regional agreements, and transboundary regulatory frameworks.³⁰ According to Gleick, for instance, the Convention on Biological Diversity is an international treaty aimed at protecting and promoting the fair use of genetic resources while enhancing the conservation of biological diversity. Additionally, he notes that the Great Lakes Water Quality Agreement has facilitated cooperation between Canada and the United States and improved the quality of water in the Great Lakes. Another example is the Mekong River Commission, which was created by Cambodia, Laos, Thailand, and Vietnam to manage the shared water resources of the Mekong River and promote sustainable development in the region.³¹

The United Nations Charter offers the most comprehensive admissible architecture for governing resources of that kind, aiming to promote sustainable peace among nations across the world.³² The International Union for Conservation of Nature (IUCN) and the United Nations Environment Programme (UNEP) collaborate to encourage sustainable usage and conservation of natural resources beyond national borders.³³

²⁹ John E. Carroll (ed.), *International Environmental Diplomacy* (New York: Press Syndicate of the University Of Cambridge, 1992)

³⁰ Jona Razzaque, *Environmental Governance in Europe and Asia* (Routledge, 2013), cited in Theodore Okonkwo, "Management of Transboundary Natural Resources," *Journal of Law and Conflict Resolution* 9, no. 4 (2017): 43-44, doi: 10.5897/JLCR2017.0772.

³¹ Gleick, P. H. (2019). Transboundary water management. In *Encyclopedia of the Anthropocene* (pp. 485-490). Elsevier.

³² Theodore Okonkwo, "Management of Transboundary Natural Resources," *Journal of Law and Conflict Resolution* 9, no. 4 (2017): 43-44, doi: 10.5897/JLCR2017.0772.

³³ CBD. (n.d.). Convention on Biological Diversity. Retrieved from <https://www.cbd.int/convention/>

There are several agreements and protocols among EAC countries that guide the governance of TBNR like Lake Victoria Basin, Lake Victoria and national parks. Such protocols include the EAC Treaty, LVBC Protocol, and Nile Basin Initiative (NBI) Framework Agreement. These agreements provide a legal framework for cooperation on issues related to water resources, fisheries, and environmental conservation with an aim of improving diplomatic relations and peace among EAC member states.

However, the effectiveness of these agreements has been limited by lack of enforcement mechanisms and a failure to fully integrate them into national legal frameworks due to competing interests of member states. There have also been challenges in implementing the agreements at the local level, where resource users may be unaware of their rights and responsibilities under the agreements.³⁴

Dhliwayo opines that the customary laws of international relations, including principles such as good neighborliness, state sovereignty, and state responsibility, can also provide a foundation of legal frameworks for initiatives aimed at managing transboundary natural resources.³⁵ These regulations are put to benefit everyone sharing the transboundary resources. According to IUCN and UNDP, EAC states have developed and implemented a range of policies related to TBNR management, including policies related to water resources, fisheries, and environmental conservation.³⁶ These policies and frameworks are generally aligned with the principles of TBNR, and emphasize the need for cooperation and collaboration between the countries of the EAC block in managing the resources. However, the implementation of these policies and frameworks has

³⁴ Ibid.

³⁵ Mandivamba Dhliwayo, "Legal Aspects of Trans-Boundary Natural Resources Management in Southern Africa" (paper presented at the IASCP Conference, 2002).

³⁶ IUCN and UNDP. 2008. Transboundary Natural Resource Management in East Africa: The Case of Lake Victoria. Nairobi: IUCN Eastern Africa and UNDP.

been impeded by a lack of resources, technical capacity, and political will among member states. There have also been challenges in coordinating and harmonizing policies across different sectors and levels of government, which has led to fragmentation and duplication of efforts thereby brewing tensions among EAC member states.

Kabagambe contends that there are several institutions engaged in the governance of Lake Victoria, including LVBC, LVFO, and various national and local government bodies.³⁷ These institutions have made some progress in promoting cooperation and collaboration among EAC member states to work together towards its sustainable management. Even though their effectiveness has been hampered by lack of resources, capacity, and coordination, the institutions have made a step towards ensuring improved relations among member states.

Overall, there has always been a general global problem as regards transboundary resource management. For example, there are 263 transboundary basins that have been identified, but the majority of them lack formal agreements among the riparian states involved.³⁸ In addition there exist more than 256 international laws and treaties governing transboundary waters, yet, states continue to grapple with the problem.³⁹ This is a clear illustration of how ineffective the existing laws are to handle the problem of transboundary natural resources. There is also laxity of reviewing policy, legal and institutional frameworks to deal with transboundary natural resources in East Africa Community⁴⁰ due to non-cooperation of member states. It goes without saying that among

³⁷ Kabagambe, Edward K. 2011. "Transboundary Resource Management and Conflict Resolution in East Africa: The Case of Lake Victoria." *African Journal on Conflict Resolution* 11 (1): 55-73.

³⁸ Joerg Sehring and Anja Deabold, *Water Unites* (Trescher Verlag, 2012), cited in Theodore Okonkwo, "Management of Transboundary Natural Resources," *Journal of Law and Conflict Resolution* 9, no. 4 (2017): 43-44, doi: 10.5897/JLCR2017.0772.

³⁹ J. Peter Blatter and Helen Ingram, "States, Markets and Beyond: Governance of Transboundary Water Resources," *Natural Resources Journal* 40, no. 2 (2000): 439-473, cited in Theodore Okonkwo, "Management of Transboundary Natural Resources," *Journal of Law and Conflict Resolution* 9, no. 4 (2017): 43-44, doi: 10.5897/JLCR2017.0772.

⁴⁰See East African Community website

EAC states there is a need for greater political will, increased resources and capacity building, and improved coordination and harmonization of policies and institutions at all levels for better diplomatic cooperation as regards TBNR.

1.6.2.2. Role of TBNR of Lake Victoria in Promoting Diplomatic cooperations between Kenya and Uganda

The United Nations Conference on Environment and Development (UNCED) and Agenda 21 documentation encouraged nations to take part in regional and global cooperation.⁴¹ Mostert affirms this by asserting that in Africa and other regions across the globe, policymakers have recognized the necessity of cooperative transboundary governance of shared water resources.⁴² In regard to this, Kabagambe acknowledges that TBNR of Lake Victoria has facilitated joint planning and decision-making between Kenya and Uganda. Through LVBC and other institutions, both countries have developed joint management plans, policies, and strategies for the lake's resources. IUCN and UNDP suggest that TBNR of Lake Victoria has also facilitated the sharing of information and data between Kenya and Uganda. This has facilitated enhanced comprehension of the lake's ecosystem and the effects of human activities on it by both countries, resulting in better-informed decisions regarding its management.⁴³

In addition, Kabagambe avers that fisheries which are a key resource in Lake Victoria, and their management requires cooperation between Kenya and Uganda. Through LVFO, both countries

⁴¹ United Nations Conference on Environment Development, Rio de Janeiro-92, cited in John E. Carroll (ed.), *International Environmental Diplomacy* (New York: Press Syndicate of the University of Cambridge, 1992).

⁴² Eelco Mostert, *Conflict and Cooperation in the Management of International Freshwater Resources: A Global Review* (Paris: UNESCO-IHP, PCCP Series 19, 2003), cited in Waltina Scheumann et al. (eds.), *Transboundary Water Management in Africa: Challenges for Development Cooperation; Study for the Research and Consultancy Projects "Cooperation on Africa's Transboundary Water Sources"* on behalf of Ministry for Economic Cooperation and Development (BMZ), 22.

⁴³ IUCN and UNDP. 2008. *Transboundary Natural Resource Management in East Africa: The Case of Lake Victoria*. Nairobi: IUCN Eastern Africa and UNDP.

have developed joint management plans for fisheries, and have implemented measures to reduce overfishing and illegal fishing practices.⁴⁴

As documented by IUCN and UNDP, Lake Victoria TBNR has moreover facilitated joint monitoring and enforcement of regulations related to the lake's resources. Through the LVBC and other institutions, Kenya and Uganda have established joint monitoring and enforcement mechanisms to ensure compliance with environmental, fisheries, and water use regulations.⁴⁵

Scheumann et al. however, assert that even though the TBNR of Lake Victoria has enhanced cooperation between Kenya and Uganda, such cooperation have not always been done with the goodwill it requires. This can be attributed largely to needs and interests of riparian states, like Kenya and Uganda, which do not intersect.⁴⁶ As stated in the common pool resource theory, the consequence of such riparian states acting independently in their self-interest definitely leads to depletion of the shared resource and exacerbation of tensions. Moreover, self-interest has played a role in the failure to adequately review legal frameworks, policies and organizational architecture related to transboundary natural resources in the East African.⁴⁷

Muigua affirms that the major setback in managing TBNR is balancing the interest of all the concerned parties.⁴⁸ He further argues that the management of shared natural resources, particularly freshwater sources, can be challenging.⁴⁹ Kenya is a big victim of this predicament

⁴⁴ Kabagambe, Edward K. 2011. "Transboundary Resource Management and Conflict Resolution in East Africa: The Case of Lake Victoria." *African Journal on Conflict Resolution* 11 (1): 55-73.

⁴⁵ IUCN and UNDP. 2008. *Transboundary Natural Resource Management in East Africa: The Case of Lake Victoria*. Nairobi: IUCN Eastern Africa and UNDP.

⁴⁶ Waltina Scheumann et al. (eds.), *Transboundary Water Management in Africa: Challenges for Development Cooperation; Study for the Research and Consultancy Projects "Cooperation on Africa's Transboundary Water Sources"* on behalf of Ministry for Economic Cooperation and Development (BMZ), 22.

⁴⁷ See East African Community website

⁴⁸ Kariuki Muigua, Ph.D., "Managing Transboundary Natural Resources in Kenya." (2018)

⁴⁹ Ibid

and in response, legislations have been passed to provide a framework on how to share transboundary natural resources. A typical example of such legislations is the water policy 2012 which provides for how water resources in the country are to be shared. Like all other policies, it also advocated for cooperation. In its objective, the policy aims to coordinate with other riparian countries to optimize the use of shared water resources crossing international borders by government.⁵⁰ Moreover, cooperation in transboundary resource management is key because it helps to reduce tensions that arise between riparian states. As noted by Jagerskog, the existence of tensions among riparian nations regarding transboundary waters can impede the possibilities of regional integration, trade, and sustainability.⁵¹

1.6.2.3. Challenges experienced in TBNR of Lake Victoria between Kenya and Uganda.

Managing transboundary natural resources of Lake Victoria is fraught with numerous challenges. One such challenge according to Smith is that both Kenya and Uganda have limited resources for managing Lake Victoria's resources. This includes financial resources, technical capacity, and human resources. Limited resources make it difficult to implement policies and regulations effectively, and to carry out monitoring and enforcement activities.⁵²

In addition according to Smith, legal framework governing TBNR of Lake Victoria is inadequate. While there are several agreements and protocols between Kenya and Uganda, these agreements lack enforcement mechanisms and are not fully integrated into national legal frameworks. This makes it difficult to enforce regulations and resolve disputes.

⁵⁰ Ibid.

⁵¹ Anders Jagerskog, Stockholm International Water Institute and United Nations Development Programme Shared Waters Partnership, "Transboundary Water Management," cited in Theodore Okonkwo, "Management of Transboundary Natural Resources," *Journal of Law and Conflict Resolution* 9, no. 4 (2017): 43-44.

⁵² Smith, J. (2018). Challenges in managing transboundary natural resources: a case study of Lake Victoria. *International Journal of Environmental Studies*, 75(6), 923-937. doi: 10.1080/00207233.2018.1479656

Miriti is of the perspective that TBNR are also faced with governance challenges e.g., the case of Lake Victoria, The national organizations tasked with ensuring the sustainable utilization of the lake have been collaborating with the East Africa Commission, LVBC, and LVFO to attain sustainability goals. However, the efforts have encountered hindrances, such as insufficient funding and ineffectual local implementing institutions. Moreover, research institutions in the LVB area have also faced sustainability difficulties, even though they generate data to guide and foster natural resource development.⁵³

He also highlights draconian policies to TBNR as a big challenge in management. This has been witnessed in the region of East African, specifically River Nile and Lake Victoria, where efforts to control over fishing such as restricting the kind and size of fishing gear, fish size, length of season and granting fishing grounds have hit a brick wall because of open access fisheries policy.⁵⁴

Miriti further highlights lack of political commitment due to self-interest as a challenge to the TBNR. This has had a ripple effect in the implementation of national policies. In addition, political leaders may prioritize their own interests or those of their constituents over sustainable resource management, leading to conflicts and unsustainable practices.⁵⁵ This has resulted to continued proliferation of other major challenges like pollution, overfishing, introduction of invasive species inter alia.

1.7. Gaps in the Literature

This study has tried to highlight the theories and studies in explaining transboundary natural resource management on diplomatic cooperation of the East Africa Community states. There is

⁵³ Evans A.K. Miriti, "Lake Victoria," African Great Lakes Information Platform, accessed on April 16, 2023, <https://agl.iisd.org/lake-victoria/>.

⁵⁴ Ibid.

⁵⁵ Ibid.

inadequate empirical research that investigates the nexus between transboundary natural resources of Lake Victoria and diplomatic cooperation among EAC member countries. In addition, Policy, legal and institutional frameworks existing today have been backed up with poor and inadequate empirical literature foundation. Moreover, they are not ratified, reviewed or not effective as required. There is little study done on the reason as to why this is happening. Finally, authors acknowledge lack of cooperation as a major problem to TBNR yet they fail to give an elaborate framework on how countries should cooperate on a shared natural resource.

1.7.1. Study Hypotheses

This study is anchored on the following hypotheses:

H1 There is a positive correlation between effective transboundary natural resource management and diplomatic cooperation of states.

H 2 Effective management of TBNR of Lake Victoria will enhance better diplomatic cooperation between the EAC members.

H 3 Better management of Lake Victoria's TBNRs will not affect Kenya-Uganda diplomatic cooperation.

1.8. Study Justification and Significance

1.8.1. Policy Justification

This study makes suggestions that if adopted and implemented by Lake Victoria Basin Commission, the major organization responsible for policy implementation in the LVB, will see an ultimate realization of the common vision for Lake Victoria, “A prosperous population living in a healthy and sustainable managed environment providing equitable opportunities and

benefits”,⁵⁶ and that of the basin at large, “sustainable water resources for people and environment of the basin”.⁵⁷This will see to it that peaceful coexistence is achieved.

The Environmental Policy Brief for the Lake Victoria Basin indicates that the development strategy has scant mention of a strategic framework beyond the overly ambitious objective of complementing the implementation of the vision and strategy by December 2007.⁵⁸In this regard, this study is an important planning tool to the relevant stakeholders concerned with putting in place a plan of action to see the full realization of a broad-spectrum structure that covers strategy, policy, legal, and institutional framework.

Finally, the study also presents an advisory paper to the relevant authorities on the importance of cooperation in TBNR management to curb climate change, eradicate water hyacinth, avoid over exploitation, over fishing and the depletion of the resources of Lake Victoria. By doing so, the study will see to it that there is continuous ethical use of the Lake’s resources.

1.8.2. Academic Justification

Due to the limited literature in this particular field, this study fills the existing academic lacuna in the TBNR management on diplomatic cooperation of East Africa Community states. Moreover, the study does so while paying attention to the case study herein. The study also acts as a new source of knowledge to the future scholars who would want to do further research on a similar area of study. Additionally, curriculum developers can extract relevant information from the study to aide in curriculum development.

⁵⁶ Omari Mwinjaka, "Lake Victoria Basin Water Resources Information Systems," presentation at the East Africa Community Lake Victoria Basin Commission Workshop on Mid-to Long-Term Water Resources Management and Planning in East Africa, accessed on April 16, 2023, <http://lvbc-ea.org/workshop-on-mid-to-long-term-water-resources-management-and-planning-in-east-africa/>.

⁵⁷ See "Lake Victoria Basin portal," accessed on April 16, 2023, <http://lvbc-ea.org/>.

⁵⁸ "Environmental Policy Brief for The Lake Victoria Basin," (2007), accessed on April 16, 2023, <http://lvbc-ea.org/wp-content/uploads/2015/03/LVBC-Enviro-Policy-Brief-2007.pdf>.

1.9. Theoretical Framework

Common Pool Resource theory is relevant to this study because it provides a useful framework for understanding the challenges of managing shared resources such as Lake Victoria between Kenya and Uganda. Both countries have a history of disputes and conflicts over the management of the lake, including disagreements over fishing rights, pollution, and water allocation. In this regard, the theory highlights the need for user cooperation, self-organization, and institutional design to promote sustainable Lake Victoria resource management.⁵⁹

Furthermore, the theory highlights the importance of addressing power imbalances and promoting equitable participation in decision-making processes to ensure that management institutions are effective and legitimate. In the context of this study, the EAC has developed a number of regional frameworks and institutions for the management of transboundary natural resources, including the LVBC and EAC Treaty. These institutions provide a platform for the negotiation of agreements and the development of shared management plans for the lake.⁶⁰

By applying CPR theory to the case of Lake Victoria, policymakers and researchers can gain insights into the challenges and opportunities of managing transboundary natural resources and identify strategies for promoting sustainable and equitable resource management and diplomatic relations among the EAC states.⁶¹

1.10. Research Methodology

Research methodology pertains to the systematic process that researchers utilize to investigate, describe, explain, and predict phenomena in a structured and rigorous manner.⁶²This section

⁵⁹ Elinor Ostrom, *Governing the commons: The evolution of institutions for collective action* (Cambridge University Press, 1990).

⁶⁰ Othieno, Lillian, et al. "Transboundary natural resource management: The case of Lake Victoria." *International Journal of Sustainable Development & World Ecology* 24, no. 1 (2017): 60-73.

⁶¹ Ibid.

⁶² Sam Goundar. (2019) "Chapter 3- Research Methodology and Research Method."

highlights the methodology to be used in this study. This research being a case study uses qualitative methodology.

The methodology provides details about the planned primary data and secondary data collection methods to be employed in this study. Primary method of data collection for this study are interviewing and administering questionnaires to the participants. The methodology outlines the procedures for selecting participants, obtaining their consent, and ensuring ethical considerations are met.

On the other hand, secondary data collection methods for this study involve obtaining information from published academic literature, going through reports, and going through publicly available government and organizations databases. The methodology discusses the criteria for selecting relevant secondary sources, data extraction procedures, and how the data is analyzed.

The methodology additionally highlights the research plan, techniques for data gathering and examination that will be utilized in this investigation.

1.10.1. Research Design

According to Creswell and Clark, research design encompasses the techniques utilized in gathering, analyzing, interpreting, and presenting data in research investigations.⁶³ Grey, on the other hand, suggests that the research design outlines the approach for obtaining necessary data, the techniques for collecting and analyzing such data, and how these processes will contribute to answering the research.⁶⁴ This study being a case study, adopts a case study research design. The case study approach enables comprehensive and detailed investigations into intricate issues within authentic and practical contexts. The study aims to find out the transboundary natural resource

⁶³ Creswell and Plano Clark. *Designing and Conducting Mixed Methods Research*, Thousand Oaks, CA:Sage,2007.

⁶⁴ Grey. *Introduction to Quality Research*.2014.

management on diplomatic cooperation of East Africa Community states using case studies of Kenya and Uganda over Lake Victoria.

1.10.2. Research Site

Research site is the physical, social and cultural setting which a study is conducted.⁶⁵ Lake Victoria, which is situated on the border of Uganda, Kenya and Northern Tanzania, occupies the Western and Eastern Rift Valley. It is Africa's largest lake and the world's second-largest freshwater lake, spanning an area of 69,000 square kilometers. The lake is jointly shared by three nations: Tanzania (49%), Uganda (45%), and Kenya (6%).⁶⁶ The lake supports 4 million livelihoods and employs 200 000 people.⁶⁷ The study is conducted in Lake Victoria because it is a typical shared natural resource characterized with tensions and conflicts arising from the lake in particular. The study is conducted with a focus on participants from national government, county government, Lake Basin Development Authority (LBDA), LVBC, Beach Management Units (BMUs), and local population.

1.10.3. Study Target Population

According to Onen, the term "target population" refers to the entire group of individuals or objects that a researcher aims to apply the findings of their study to. This population must meet certain criteria that are of interest to the researcher.⁶⁸ The target demographic for the research included 3 departmental level employees from the Ministry of Agriculture, Livestock, Fisheries and Cooperatives, 10 employees (director, departmental heads and other senior staff) from Lake Basin Development Authority, 3 (departmental heads) from Lake Victoria Basin Commission, 9

⁶⁵ R. Burke Johnson, Antony J. Onwuegbuzie, Lisa A. Turner, "Towards a Definition of Mixed Methods Research," *Journal of Mixed Methods Research*, 2007.

⁶⁶ UNEP and GEF, 2008, "Transboundary Issues."

⁶⁷ Evans A.K. Miriti, "Lake Victoria", African Great Lakes Information Platform.

⁶⁸ David Onen (Ph.D.). "Study Population and Sampling." College of Education and External Studies, Makerere University. (2020).

employees from Department of Agriculture, Irrigation, Livestock and Fisheries (Kisumu County Government), 35 members from selected Beach Management Units and 80 local fishermen. This brought the total target population to 140 people.

Primary data was collected from the target population by conducting interviews and administering questionnaires. Moreover, secondary data was obtained from open access government databases, scholarly publications and government reports on Lake Victoria.

1.10.4. Sampling Size

According to Osuala, sampling refers to the process of selecting a subset from a population or universe that accurately represents the whole population or universe.⁶⁹ For a research study to be both effective and credible, it is necessary to sample a reasonable proportion of the population. Salkind emphasized the importance of having an appropriate sample size in any research study.⁷⁰ Insufficient sample size fails to accurately represent the population and can result in Type I errors, which occur when a specific finding is wrongly rejected.⁷¹ On the other hand, Sekaran argued that an excessively large sample size is not suitable as it may lead to potential issues of Type II errors, which involve accepting a particular finding when it should be rejected.⁷²

Since the numerical strength of our study is well known, this study used Yamane's statistical formula to find the sample size required as follows:

$$n = N / [1 + N (e)^2]$$

Where; **n** = the sample size

N = the finite population

⁶⁹ Osuala, E. C. . Introduction to research methodology (3rd ed.). (Onitsha: African – First Publishers Ltd., 2007.)

⁷⁰ Salkind, N. J. T.). Exploring research.(Upper Saddle River, NJ: Prentice Hall, 2010).

⁷¹ Sekaran, U.. Research methods for business: A skill building approach. 4 ed., (New Jersey:John Wiley and sons)

⁷² Ibid.

e = the level of significance or limit of tolerable error at 5% (standard value of 0.05%)

1 = unit or a constant

Using the formula, a total of 160 individuals were engaged in the survey as calculated below.

$$n = 140 / (1 + 140(0.05)^2)$$

$$n = 140 / (1 + 140(0.0025))$$

$$n = 140 / (1 + 0.35)$$

$$n = 140 / 1.35$$

$$n \approx 103.70$$

This brought the sample size of the study to 104 individuals.

1.10.5. Sampling Technique

The study adopted both purposive and random sampling techniques. Purposive sampling is a method of sampling that deliberately selects specific people, events, or settings to obtain essential information that cannot be obtained from other sources.⁷³ Purposive sampling was achieved by interviewing and administering questionnaires to key informants from various departments. In contrast, with random sampling, each element within the population had an equal probability of being selected for inclusion in the sample.⁷⁴

1.10.6. Data Collection Methods

1.10.6.1. Survey Questionnaire

Two questionnaires were developed (Appendices I and II) as the suitable tools to collect primary

⁷³ Maxwell, J. A. 1996. *Qualitative Research Design: An Interactive Approach* London, Applied Social Research Method Series.

⁷⁴ Hamed Taherdoost. 2016. "Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research," *International Journal of Academic Research in Management*. Vol. 5, No.2.

data in this study. The questionnaires were designed to answer the key objectives of the study and self-administered by the researcher in order to collect data from the respondents.

1.10.6.2. Key Informant Interviews

The researcher also used interview schedules (Appendix III) to collect data from selected key informants like parastatal heads, departmental heads and directors. The researcher did this on purpose to obtain certain kind of data regarding the study.

1.10.7. Data Processing and Analysis

The process of analyzing data involves utilizing numerical and factual information to address the research.⁷⁵ It helps to give answers to research questions by identifying, transforming supporting decision making and bringing a cohesion to a research.⁷⁶ Data analysis in this study was in line with the research objectives. The main themes were identified and classified according to academic merit.

Microsoft Excel was used to clean and cross-check missing quantitative data. This was followed by analysis by use of descriptive statistics and finally the findings were presented in pie charts and a bar graph. Qualitative data analysis was used to analyze the study findings. This is simply because qualitative analysis enables collection of more complex information and exploration of people's thoughts and behavior at the same time.

Qualitative data was coded through the coding technique using MAXQDA 2022 software. By employing this approach, the researcher partitioned the data into distinct sections. Each section was assigned a unique code indicating how the corresponding data contributes to the research objectives under investigation. Reports were then generated by the same software after the coding process. Through summarizing the frequency of codes, examining commonalities and

⁷⁵ Joel Ashirwadam. 2008. Communication Research Methods: Methods of Data Analysis.

⁷⁶ Ibid.

disparities among codes in different original contexts, and analyzing the interrelationships between one or more codes, the researcher conducted a comprehensive analysis.

1.10.8. Research Ethical Considerations

Fleming and Zegwaard highlight informed consent of participants, protection of participants from risk of harm, anonymity of participants and confidentiality of participants, and lack of conflict of interest from the researcher as the cornerstones to guide a researcher around designing an ethically acceptable research.⁷⁷ Bryman and Bell affirm that a research should not harm the participants; it should respect their dignity and privacy, should obtain consent and maintain confidentiality, and bias during data collection, analysis and presentation should be avoided.⁷⁸

The study took ethical considerations and requirements into account, recognizing the sensitive relationships between the researcher and respondents. To ensure this, appropriate measures were taken to protect the confidentiality of the information provided by respondents during the study period. The researcher used the information solely for academic purposes and did not disclose the names of respondents in the study.

The researcher obtained a letter from the University of Nairobi to validate his affiliation with the university and subsequently facilitate his application of the research permit from National Commission for Science, Technology and Innovation (NACOSTI).

⁷⁷ Jenny Fleming and Karstain E. Zegwaard.2018. "Methodologies, methods and ethical considerations for conducting research in work-integrated learning."

⁷⁸ De Vaus, D.A. Research Design in Social Research. London: SAGE Publications, 2001.

See Bryman, A. and E. Bell. Business Research Methods. 2nd edition. Oxford: Oxford University Press, 2007.

See "Editorial: Special Issue on Organizational Research Methods." British Journal of Management 18, no. 1 (2007):n.p.

1.10.9. Scope and Limitations of the Study

This research focused only on transboundary natural resource management on diplomatic cooperation of East Africa Community states. This study focused on determining and analyzing the role played by TBNR of Lake Victoria in promoting cooperation between Kenya and Uganda and investigated key challenges experienced in TBNR of Lake Victoria governance between Kenya and Uganda.

However, the research was limited by the following factors. Firstly, the research was limited to the perspectives of the participants who were selected for the study, and therefore, may not have fully represented the views of the wider population. Secondly, the study was limited by the availability of relevant data and resources, and may not have been able to capture all relevant factors that contribute to TBNR management. Moreover, the study was limited by time constraints.

1.11. Chapter Outline

1.11.1. Chapter one: Introduction.

This chapter introduces the study by contextualizing the research problem. It further highlights the background to the study, the study objectives and research questions. The chapter also reviews the relevant literature and provides justification of the study and methodology to be used in the study.

1.11.2. Chapter two: Transboundary Natural Resource Management and Promotion of Diplomatic Cooperation.

This chapter begins with a brief introduction. It looks at the importance of Transboundary Natural Resource Management explaining why it is necessary to manage natural resources across borders and the benefits that can be derived from doing so. The chapter also looks at Diplomatic cooperation and Natural Resource Management describing how diplomatic cooperation between

countries can affect transboundary natural resource management, including its importance among nations.

The chapter provides case studies giving examples of successful transboundary natural resource management initiatives and how they have helped to promote diplomatic cooperation between countries. The chapter ends with a conclusion giving a summary of the entire chapter.

1.11.3. Chapter three: TBNR of Lake Victoria and Diplomatic Cooperation between Kenya and Uganda.

The chapter begins with an introduction and background information about Lake Victoria laying its geography, history, and importance to Kenya and Uganda. The chapter looks at some of the pertinent treaties for the management and sustainable development of Lake Victoria Basin (TBNR) giving their origins, objectives, and implementation procedures. The chapter equally captures the diplomatic cooperation between Kenya and Uganda, including the historical background and key events that have shaped their relationship over time. The chapter concludes with a summary of its contents.

1.11.4. Chapter four: Challenges experienced in TBNR of Lake Victoria between Kenya and Uganda.

This chapter begins with an introduction. It covers the following ecological thematic areas: Impacts of climate change, Water quality and pollution, Challenge posed by water hyacinth and Decline of biodiversity and fisheries. The chapter the discusses the thematic areas as follows: Impacts of climate change (Effects on lake levels and water availability); Water quality and pollution (Sources of pollution -industrial, agricultural, domestic.; Eutrophication and nutrient runoff, Impact on aquatic life and human health); Challenge posed by water hyacinth (Introduction and spread of water hyacinth, Ecological and economic impacts, Control and management

strategies); Decline of biodiversity and fisheries (Overfishing and unsustainable practices, Habitat degradation and loss, Implications for local communities and food security).

1.11.5. Chapter five: Summary, conclusion and recommendation

This chapter gives the summary and conclusions of each research question and objective of the study and subsequent recommendations.

CHAPTER TWO

Transboundary Natural Resource Management and Promotion of Diplomatic Cooperation.

2.1. Introduction

Since international frontiers are political rather than ecological frontiers, a number of ecological components are divided by territorial divisions, resulting in varied management practices across these borders.⁷⁹ Such resources include rivers, lakes and wildlife that transcend more than one jurisdiction and pose difficulties in management despite millions of people depending on them to support their livelihoods. It is therefore crucial to have a comprehensive way of managing such transboundary resource to help avoid over exploitation by one party, curb the adverse effects of climate change and achieve peace and stability, which are the cornerstones of good diplomatic cooperation.

As argued by Griffin et al., Transboundary management of natural resources involves collaboration across borders to enhance the management of natural resources, resulting in benefits for all involved parties.⁸⁰ Kaula affirms that while many countries have established policies and legal frameworks for managing natural resources within their borders, the management of many resources cannot be effectively carried out at the national level. The reason is that activities within one country often have implications for neighboring countries. Kaula further posits that cooperation

⁷⁹ Van der Linde, H., J. Oglethorpe, T. Sandwith, D. Snelson, and Y. Tessema (with contributions from Anada Tiega and Thomas Price). 2001. *Beyond Boundaries: Transboundary Natural Resource Management in Sub-Saharan Africa*. Washington, DC, U.S.A.: Biodiversity Support Program.

⁸⁰ C. Griffin, M. Kajutti, M. Mansourian, and M. Swallow, *Transboundary Natural Resources: The Intersection of International Law and International Relations* (Cambridge University Press, 1999).

is necessary for managing such resources, particularly in light of the increasing depletion and scarcity of natural resources.⁸¹

Management of TBNR assume the forms of global frameworks, regional agreements and transboundary regulatory frameworks which are implemented by regional organizations, governments, donors, and the private sector, with the aim of achieving sustainable socioeconomic benefits from shared natural resources. The United Nations Charter is a significant global legal instrument to guide the parties in managing transboundary natural resources to maintain peace and good diplomatic relations among states. The preamble of the Charter highlights the importance of establishing international mechanisms to promote economic and social progress and advancement for all people, which can be achieved through cooperation in managing natural resources.⁸² Global customary legislations, including the concepts of national sovereignty, state responsibility, and harmonious coexistence among neighboring states, additionally provide a lawful foundation for transboundary natural resource management, as noted by Okonkwo. Above concepts can function as underpinning frameworks to manage shared natural resources and promoting cooperation between states.⁸³

East African Community (EAC) has implemented several institutions and regional frameworks which facilitate cooperation between member states in the governance of shared resources, including Lake Victoria Basin Commission and Mara River Basin Transboundary Management Programme. Through these initiatives, the EAC aims to promote sustainable resource use, reduce

⁸¹C.G. Kaua, "Transboundary natural resource management: Rationale, challenges and way forward," *International Journal of Environmental Protection and Policy* 2, no. 6 (2014): 174-182.

⁸² Theodore Okwonkwo, "Management of transboundary natural resources." 2017. *Journal of law and conflict resolution*.

⁸³ Ibid.

conflicts, enhance cooperation and ultimately improve diplomatic relations between member states.

This chapter, will explore the idea of transboundary natural resource governance and promotion of diplomatic relations at the global, regional, and sub-regional levels. It will do so by highlighting the importance of transboundary resource management, diplomatic cooperation and resource management and combing through relevant case studies herein.

2.2. Importance of Transboundary Natural Resource Management (TBNRM)

TBNRM is of significant global importance due to the increasing recognition of the interdependence of natural resources across borders.⁸⁴TBNRM is essential for promoting peace, security, and sustainable development. Having recognized this fact, in 2015, every nation affiliated with United Nations (UN) embraced the 2030 Agenda for Sustainable Development, which serves as a collective plan for promoting harmony and well-being for both humanity and the planet, presently and in future.⁸⁵ SDG number 15 in particular talks about life on land and urges countries to guarantee the preservation, rehabilitation, and responsible exploitation of land-based and freshwater ecosystems and the benefits they provide, particularly forests, wetlands, mountains, and arid areas in one of its targets. Moreover, it calls for the cooperation and coordination of TBNRM efforts among countries.⁸⁶

In pursuit of peace, security, and sustainable development, the worldwide approach to natural resource management promotes the idea that conflicts between countries over the sharing of a

⁸⁴ WWF, "Transboundary River Basins: Status and Trends," accessed May 10, 2023, <https://wwf.panda.org/?uNewsID=102376>.

⁸⁵ United Nations Department of Economic and Social Affairs, Sustainable Development, accessed May 1, 2023, <https://sustainabledevelopment.un.org/>.

⁸⁶ United Nations. Sustainable Development Goals.(2015). Retrieved from <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

water source should be resolved peacefully. This necessitates establishing procedures that identify the stakeholders and methods for mediating and negotiating cross-boarder conflicts. Were quotes Rahaman opining that "if the states concerned are unable to reach an agreement by negotiation, all states involved in an international watercourse should strive for a peaceful resolution of the disputes."⁸⁷ Moreover, Management of TBNR can help prevent conflicts that might arise from the utilization of natural resources that are collectively shared, like water bodies or forest reserves⁸⁸ in that joint management of these resources can foster a sense of ownership and shared responsibility among the countries, promoting long-term stability and security.

TBNRM is also important for promoting regional integration and cooperation. This is in line with African Union's Agenda 2063 which recognizes the importance of TBNRM in achieving the aspirations of the continent, including peace, prosperity, and integration.⁸⁹ The same is affirmed by COMESA that TBNRM has been identified as a key driver of regional integration and cooperation.⁹⁰

Southern African Development Community (SADC) also advocates that regional collaboration is not a discretionary add-on, but an essential element for survival.⁹¹ This is a true reflection of the 1992 SADC treaty. Although the treaty does not explicitly advocate for TBNRM, it promotes cross-border social, economic, cultural cooperation, and natural resource management. The

⁸⁷ Edmond Were, "Conflict of interest in exploitation and utilization of transboundary natural resources on Lake Victoria," *Journal of African Conflicts and Peace Studies*: Vol. 3: Iss. 1., DOI: <http://dx.doi.org/10.5038/2325-484x.3.1.1078>

⁸⁸ Peter H. Gleick, "Water, Drought, Climate Change, and Conflict in Syria," *Weather, Climate, and Society* 6, no. 3 (2014): 331-340, doi: 10.1175/WCAS-D-13-00059.1.

⁸⁹ African Union. (2015). Agenda 2063: The Africa We Want. Retrieved from <https://au.int/agenda2063>

⁹⁰ COMESA. (2015). COMESA Strategy for Transboundary Natural Resources Management. Retrieved from <https://www.comesa.int/wp-content/uploads/2019/08/Transboundary-Natural-Resources-Management-Strategy.pdf>

⁹¹ Van der Linde, H., J. Oglethorpe, T. Sandwith, D. Snelson, and Y. Tessema (with contributions from Anada Tiega and Thomas Price). 2001. *Beyond Boundaries: Transboundary Natural Resource Management in Sub-Saharan Africa*. Washington, DC, U.S.A.: Biodiversity Support Program.

harmonization of laws, policies, and regulations among nations is a crucial aspect for effectively managing shared resources. The Treaty aimed to facilitate this harmonization by uniting all members under a shared goal as stipulated in Article 21, which urges collaboration in the preservation and governance of the environment and natural resources.⁹²

Africa has witnessed rising conflicts and tensions brought by transboundary natural resource such as water sources. The situation has been exacerbated by mismanagement of such resources by either side of the conflicting parties claiming ownership. Therefore it calls for the effective management of TBNR through joint management and collaboration, to prevent conflicts and contribute to conflict resolution.⁹³

Although the principal objective for creating regional institutions such as COMESA, SADC and EAC is to promote economic growth, there is growing emphasis on incorporating wider environmental considerations and sustainable natural resource management into these accords, given society's reliance on natural resources. A study conducted by Biodiversity Support Program on TBNRM in Southern Africa revealed that there is considerable untapped potential for nature-based tourism in the region under a transboundary framework.⁹⁴ This highlights the need for cooperation in TBNRM to maximize the benefits. Additionally, cooperation in TBNRM in can help build trust and promote peaceful relations among African countries that share natural resources. This can contribute to regional stability and security, as well as economic development.⁹⁵

⁹² Mutuso Dhliwayo, "Legal Aspects Of Trans-Boundary Natural Resources Management In Southern Africa," (paper prepared for the IASCP conference, 2002, Harare, Zimbabwe).

⁹³ UNECA. "Transboundary Natural Resources Management in Africa: Challenges, Prospects and Emerging Issues." African Development Forum Briefing Paper Series, no. 7, 2010.

⁹⁴ Ibid.

⁹⁵ SADC. "SADC Protocol on Shared Watercourses." Southern African Development Community, 2000.

In East Africa, TBNRM is crucial for addressing transboundary ecological issues, like climate change, biodiversity loss, and pollution among other challenges. As Were puts it, the LVBC was established within the EAC with the recognition that Lake Victoria together with its basin constituted a region of shared interest and a regional economic zone to be developed by member countries. The objective of managing the lake through LVBC resources is to tackle transboundary challenges by implementing strategies and programs that promote collaboration among member nations in economic, political, social, and cultural areas among others for mutual benefit.⁹⁶ Similarly, the LVFO was founded with a primary aim of unifying local statutes and regulations that promote the responsible utilization of Lake Victoria's living resources and creating alongside implementing measures to conserve and manage them sustainably for posterity.⁹⁷

2.3. Diplomatic Cooperation and Transboundary Natural Resource Management

Diplomatic relations are instrumental in facilitating the development of cooperative frameworks for managing transboundary natural resources. One such framework is the UN Convention on Non-navigational uses of International watercourses which calls for fair and reasonable use of international waterways, and for Watercourse Nations to engage in that usage on a fair and just basis. Additionally, the Convention outlines responsibility of Watercourse Nations to take necessary precautions to avoid causing substantial damage to other Watercourse Nations as a result of their utilization of shared watercourse.⁹⁸

⁹⁶ Edmond Were, "Conflict of interest in exploitation and utilization of transboundary natural resources on Lake Victoria," *Journal of African Conflicts and Peace Studies*: Vol. 3: Iss. 1., DOI: <http://dx.doi.org/10.5038/2325-484x.3.1.1078>

⁹⁷ East African Community. Lake Victoria Basin Commission 2008.. Retrieved from <https://www.eac.int/lake-victoria-basin-commission>

⁹⁸ Zewdineh B. Haile and Ian L.G. Wadley, "Common Goods and the Common Good: Transboundary Natural Resources, Principled Cooperation, and the Nile Basin Initiative," *Natural Resources Journal* 50, no. 2 (2010).

United Nations has given prominence to diplomatic efforts aimed at resolving conflicts that arise from TBNR. Such efforts are aimed at achieving peace and improving relations between states. UNEP for example, emphasizes the need for diplomatic negotiations in resolving conflicts that arise from transboundary shared water sources to achieve peace and stability.⁹⁹ Moreover, SDG 6 which speaks on the accessibility and enduring water governance and sanitation for everyone, through its target 6.5 calls for application of management of shared water resources at all levels, including through cross-boarder cooperation and diplomatic negotiations among stakeholders.¹⁰⁰ Mekong River Commission, established in 1995, is an intergovernmental organization that promotes cooperation and negotiation among the Lower Mekong Basin countries (Cambodia, Laos, Thailand, and Vietnam) for sustainable management of Mekong River's resources. This is a global illustration of a successful diplomatic cooperation effort.¹⁰¹ The Convention on Biological Diversity (CBD) founded in 1992 is also a global agreement that aims to enhance the preservation and responsible utilization of biological diversity, and it has been ratified by 196 countries. The treaty requires states to collaborate in the conservation and governance of transboundary natural resources, like wildlife and ecosystems. By so doing, the treaty aims to further foster collaboration of such states that share transboundary resources.¹⁰²

African Charter on Human and Peoples' Rights, 1981 is a treaty that acknowledges the entitlement of African individuals to control their natural resources and to enjoy a healthy and viable environment. It also obligates African countries to cooperate in the governance and conservation

⁹⁹ UN Environment Programme (UNEP). Water diplomacy: Making water cooperation happen. (2018). Retrieved from <https://www.unep.org/resources/report/water-diplomacy-making-water-cooperation-happen>

¹⁰⁰ United Nations. Sustainable Development Goals.(2015). Retrieved from <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

¹⁰¹ Mekong River Commission (MRC). Overview of the MRC. (2021). Retrieved from <https://www.mrcmekong.org/about-the-mrc/overview-of-the-mrc/>

¹⁰² United Nations Environment Programme. Convention on Biological Diversity. 1992. Retrieved from <https://www.cbd.int/convention/>

of transboundary natural resources.¹⁰³ In the African continent, diplomatic collaborative efforts have fostered good relations among countries sharing TBNR. The successful management of TBNR and through frameworks and treaties in the continent is a testament to this achievement. Some examples of such TBNR that have been successfully managed through diplomatic cooperation include the Greater Limpopo National Park, which covers an area of 35,000 square miles and traverses Mozambique, Zimbabwe, and South Africa. Other examples include the Mara-Serengeti National Park, which extends across Kenya and Tanzania, the Kalagadi Trans-frontier National Park, which crosses South Africa and Botswana, the Mt Elgon National Park, which covers areas in Kenya and Uganda, and the Virunga National Park, which spans Rwanda, Uganda, and the Democratic Republic of Congo.¹⁰⁴ Additionally, diplomatic efforts have also led to the establishment of transboundary conservation areas, such as Kavango-Zambezi cross-border Conservation Area, which stretches five Southern African countries: Angola, Botswana, Namibia, Zambia, and Zimbabwe.¹⁰⁵

As earlier stated, diplomatic relations are instrumental in facilitating the development of cooperative frameworks for managing transboundary natural resources. The same is true on the African continent as several multilateral declarations and documents have been endorsed on the continent, emphasizing the importance of transboundary cooperation. Examples of such declarations include the NEPAD Action Plan and the AMCOW Abuja Declaration. Although most

¹⁰³ African Union. (1981). African Charter on Human and Peoples' Rights. Retrieved from <https://au.int/en/treaties/african-charter-human-and-peoples-rights>

¹⁰⁴ Barbara Nakangu Bugembe, "Natural Resource Governance Framework Challenges and Opportunities in Eastern and Southern Africa," (REGIONAL SCOPING REPORT, International Union for Conservation of Nature Commission on Environmental, Economic and Social Policy, November 2016), <https://portals.iucn.org/library/sites/library/files/documents/2016-063.pdf>.

¹⁰⁵ Gandiwa, E., Muboko, N., & Zisadza, P. The Kavango-Zambezi Transfrontier Conservation Area: Opportunities and challenges. *Parks*, (2019) 25(2), 9-18.

African river basins lack formal agreements or understandings, there are already signed agreements for 20 of them, including all the crucial transboundary waterbodies.¹⁰⁶

International water management can also serve as a means of promoting diplomatic cooperation and higher-level regional integration efforts. This is exemplified by the SADC, whose 14 member countries are committed to managing transboundary waterbodies in a coordinated and cooperative manner. By prioritizing economic cooperation and integration among its partner countries, SADC aims to bolster growth and prosperity in the region. The significance of this issue is illustrated by the fact that the first cooperation protocol signed in the SADC framework was the SADC Protocol on Shared Watercourse Systems (1995).¹⁰⁷

In East Africa, Transboundary natural resources such as Lake Victoria and Mara- Serengeti national park management have only been possible through cooperation fostered by diplomacy. The Lake Victoria Basin, shared by Kenya, Tanzania, and Uganda, is one example of a shared water resource that requires cooperation and diplomacy. The LVBC, established in 2003, is an example of a cooperative framework that aims to enhance sustainable governance and development of the Lake Victoria Basin's water resources.¹⁰⁸

2.3.1. Case Studies on TBNR

Great Lakes Water Resources

The Laurentian Great Lakes, which span across the United States and Canada, make up the largest freshwater ecosystem in the world and contain almost 20% of the Earth's fresh surface water. The

¹⁰⁶ Waltina Scheumann and Susanne Neubert, *Transboundary Water Management in Africa: Challenges for Development Cooperation*; Study for the Research and Consultancy Project "Cooperation on Africa's Transboundary Water Resources" on behalf of the Ministry for Economic Cooperation and Development (BMZ) (Bonn: German Development Institute, 2006).

¹⁰⁷ Ibid.

¹⁰⁸ Lake Victoria Basin Commission (LVBC), "About LVBC," accessed May 2, 2023, <https://lvbc.securehostdns.com/about-lvbc/>.

Great Lakes represent a critical example of a shared transboundary freshwater system on a global scale, giving rise to intricate and challenging questions regarding transboundary governance.¹⁰⁹

For several decades, issues regarding water governance in the Great Lakes Basin have primarily revolved around apprehensions regarding water contamination and the channeling of water resources, as well as identifying the most effective ways to safeguard these resources against external interests. As the basin is situated on the border of the United States and Canada, many of these issues, along with the policies intended to resolve them, have transboundary implications.¹¹⁰

The United States and Canada recognized the issue of contamination in shared water resources and sought to address it in what would be the maiden global treaty to address cross-border contamination.

The joint initiatives undertaken by the United States and Canada to regulate the largest freshwater ecosystem globally are frequently cited as an exemplar of harmonious cross-border collaboration in the management of natural resources.¹¹¹

As noted by Schulte, starting from the beginning of the 1900s, various accords, pacts, and treaties have endeavored to synchronize the regulation of the water resources in the Great Lakes Basin. Over time, these agreements have shifted their focus from collecting data to developing more extensive policies and procedures for managing the water resources.¹¹² Karkkainen also concurs that in the last five decades, a number of ambitious Great Lakes Water Quality Agreements (GLWQA) have been formulated. These are cross-border executive agreements established to

¹⁰⁹ Bradley C. Karkkainen, "The Great Lakes Water Resources Compact and Agreement: A Model for Transboundary Governance at Subnational Scales?" *Sea Grant Law & Policy Journal* 9, no. 3 (2016): 1-22.

¹¹⁰ Peter Schulte, "The Great Lakes Water Agreements," *Water Brief* 2 (2019): 1-5.

¹¹¹ Bradley C. Karkkainen, "The Great Lakes Water Resources Compact and Agreement: A Model for Transboundary Governance at Subnational Scales?" *Sea Grant Law & Policy Journal* 9, no. 3 (2016): 1-22.

¹¹² Peter Schulte, "The Great Lakes Water Agreements," *Water Brief* 2 (2019): 1-5.

conserve and rehabilitate water quality and environmental well-being of the ecosystems in the Great Lakes Basin.¹¹³

In 2001, Annex 1 was added to the 1985 Great Lakes Charter, wherein the signatory nations committed to devising a cooperative water governance system for the Great Lakes Basin. After several efforts, eight states in the U.S. and two provinces in Canada ratified the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement in 2005. This treaty created a plan in which these regions can collectively safeguard and regulate their mutual freshwater resources.¹¹⁴

Several advantages related to governance have resulted from these agreements. For instance, the bi-national science advisory boards created by the treaty have facilitated increased collaboration between government agencies and scientists. Additionally, public engagement has led to greater transparency and accountability of federal activities. Moreover, the agreement's nonbinding authority has spurred the formation of robust non-governmental organizations, along with fostered nexus between federal and local strategy. Although these benefits were not directly intended, they have played a crucial role in the successful attainment of environmental benefits.¹¹⁵

As opined by Karkkainen, the dedication to preserve water resources in the Great Lakes Basin seems to represent an authentic, basin-wide agreement. While this does not imply a consensus of opinion, the vast majority of views at both popular and elite levels in every area within the basin favor the objectives of the Compact and Agreement.¹¹⁶

¹¹³ Bradley C. Karkkainen, "The Great Lakes Water Resources Compact and Agreement: A Model for Transboundary Governance at Subnational Scales?" *Sea Grant Law & Policy Journal* 9, no. 3 (2016): 1-22.

¹¹⁴ Peter Schulte, "The Great Lakes Water Agreements," *Water Brief* 2 (2019): 1-5.

¹¹⁵ United Nations Economic Commission for Europe, "Policy Guidance Note on the Benefits of Transboundary Water Cooperation: Identification, Assessment and Communication" (New York and Geneva: United Nations, 2015)

¹¹⁶ Bradley C. Karkkainen, "The Great Lakes Water Resources Compact and Agreement: A Model for Transboundary Governance at Subnational Scales?" *Sea Grant Law & Policy Journal* 9, no. 3 (2016): 1-22.



Figure 1. Great Lakes Water Resources

Source: Wikipedia

The Cubango-Okavango River Basin (CORB)

The Cubango-Okavango River Basin, situated in southwestern Africa and shared by Angola, Botswana, and Namibia, offers a fascinating example of states' ability to execute specific aspects of adaptive governance, particularly cooperative management of a precarious and crucial resource in an atmosphere of elevated uncertainty.¹¹⁷ Most of the water that feeds the Okavango Delta originates from Angola and flows through Namibia before reaching Botswana. Ensuring

¹¹⁷ Olivia O. Green, Barbara A. Cosens, and Ahjond S. Garmestani, "Resilience in Transboundary Water Governance: the Okavango River Basin," *Ecology and Society* 18, no. 2 (2013): n.p., accessed May 2, 2023, <https://www.jstor.org/stable/26269304>.

successful cooperation among Botswana, Angola, and Namibia is crucial for the preservation of the Okavango Delta.

As such, for more than two decades, Angola, Botswana, and Namibia have been collaborating in the understanding and administration of the CORB through the Permanent Okavango Basin River Commission (OKACOM). OKACOM was founded to serve as a technical consultant to the three nations on matters concerning preservation, exploitation, and progress.¹¹⁸ The CORB operates under a mutually accepted policy plan called the Strategic Action Programme, which establishes the principles for enhancement of the basin and the betterment of quality of life of its inhabitants via the collaborative governance of the basin and its shared ecological resources.¹¹⁹

Following the collaboration in the management of CORB, the three countries have achieved tremendous economic benefits, social and environmental benefits, regional integration and peace

¹¹⁸ Ibid.

¹¹⁹ Permanent Okavango River Basin Water Commission (OKACOM), Realising the Benefits of Transboundary Water Cooperation in the Cubango-Okavango River Basin (United Nations Economic Commission for Europe (UNECE), June 2020), https://unece.org/fileadmin/DAM/env/water/activities/Benefits_cooperation/OKACOM_Policy_Document_June_2020.pdf.

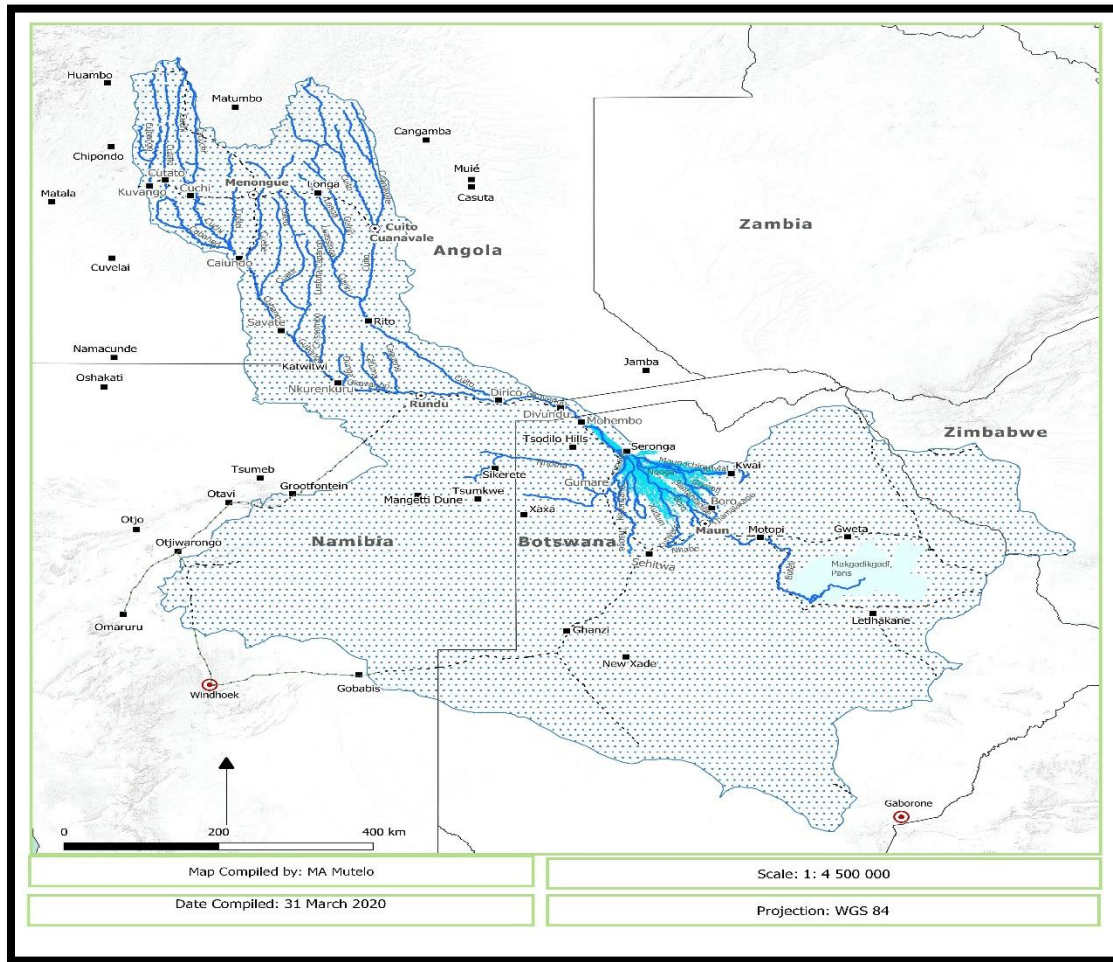


Figure 2. The Cubango-Okavango River Basin

Source: OKACOM

Nile River Basin

The Nile River Basin spans across 11 nations and comprises of two primary tributaries: White Nile and Blue Nile. White Nile originates from the mountains of Burundi, Rwanda, and Democratic Republic of Congo (“DRC”) as well as from Lake Victoria. Conversely, Blue Nile is formed by the waters from Ethiopia, Eritrea, and Sudan. Eventually, Blue Nile and White Nile converge at

¹²⁰ Ibid.

Khartoum in Sudan to create the primary section of River Nile, which flows through Egypt and empties into Mediterranean Sea.¹²¹

The 1929 Nile Waters Agreement between Egypt and Sudan gave priority to water needs of Egyptians and granted Egypt the mandate to veto future hydroelectric projects in British colonies along Nile River, including Kenya, Sudan, Tanganyika, and Uganda. Although the agreement was between Great Britain, Egypt, and other regions under British control, it is rejected en masse by other Nile riparian states. Egypt, however, argues that the treaty is still valid under the principle of state succession in international law. In 1959, Sudan and Egypt replaced the 1929 treaty with the Agreement for the Full Utilization of the Nile Waters, which assigned the entire flow of the Nile at the Aswan Dam to Sudan and Egypt, causing tension among other riparian states who invoked Nyerere Doctrine and principles of law of international water to contest the 1959 Agreement and claim a share of Nile waters.¹²²

Despite a long history of protracted negotiations over distribution and utilization of Nile water resources, riparian nations have taken steps towards cooperation. NBI was established in 1999, with the involvement of external agents, after predictions that tensions over the Nile waters could result to violent conflict between the riparian nations.¹²³ In a show of willingness to cooperate, Nile riparian countries have signed a cooperative framework agreement (CFA), except for Egypt, Sudan, and South Sudan.

CFA Treaty aims to create principles, rights, and responsibilities that promote enduring and sustainable governance and advancement of the mutually shared Nile waters . The provisions of

¹²¹ Richard K. Paisley, and Taylor W. Henshaw, "Transboundary governance of the Nile River Basin: Past, present and future," International Waters Governance Initiative, University of British Columbia

¹²² Ibid

¹²³ Ibid.

the Treaty require the Nile Basin countries to commit to collaborating on the preservation, governance and growth of the Basin and its waters.¹²⁴

Moreover, the establishment of an enduring and joint governance institution called the Nile River Basin Commission (NRBC) is proposed in the Treaty to provide a lawful plan for enhanced Nile collaboration. The NRBC would have legal personality and be responsible for coordinating national development projects with basin-wide development to maximize the use of the Basin's resources and enhance the benefits of regional cooperation for all Nile Basin states.¹²⁵



Figure 3. Nile River Basin

Source: Wikipedia

¹²⁴ Cooperative Framework Agreement, Nile Basin Initiative, accessed May 2, 2023, <https://www.nilebasin.org/index.php/81-nbi/73-cooperative-framework-agreement>.

¹²⁵ Ibid.

2.4. Conclusion

From the foregoing, it is evident that effective governance of TBNR can foster good diplomatic cooperation and peaceful coexistence between states. Good transboundary resource governance strategies can alleviate accrued animosity rising from such shared resources, enhance sustainable use of the resources and promote their equitable use. Moreover, the case studies herein of Great Lakes Water Resources, CORB, and Nile River Basin are a testament to successful TBNR management and how such governance foster cooperation towards common goals. The case studies call for the need for collaboration, effective communication and trust-building among countries. The case studies equally paint a vivid picture of challenges encountered in TBNR management. Therefore, it goes without saying that in order to combat global problems such as climate change, environmental degradation, and resource based conflicts inter alia, promotion of diplomatic collaboration in TBNR management is the way to go.

CHAPTER THREE

Role of TBNR of Lake Victoria in Promoting Diplomatic Cooperation between Kenya and Uganda

3.1. Introduction

Situated in the region of East Africa, Lake Victoria is the largest lake in the developing world and the second-largest globally, covering a surface area of approximately 68,800 square kilometers. In 1858, a renowned British explorer by the name of John Hanning Speke bestowed the lake with its appellation after Queen Victoria, following his remarkable discovery. The lake spans 400 km in the north to south direction and extends 240 km from east to west and is shared by Kenya, Tanzania, and Uganda. However, the distribution of the lake is not equal among the three countries, with Kenya having only 6%, while Tanzania having 51% and Uganda having 43%.¹²⁶

According to Okungu et al., the catchment area of Lake Victoria is extensive, covering nearly triple the magnitude of the lake's size itself. This area stretches across three East African nations- Kenya, Uganda, and Tanzania, alongside Rwanda and Burundi. It encompasses a total area of approximately 193,000 km² with a tributary that transport various substances, including water, nutrients, sediments, and pollutants into the lake. In Kenya, the catchment area covers approximately 42,460 km² making it the second largest after Tanzania.¹²⁷ Moreover, the catchment area of Lake Victoria is home to nearly 40 million individuals, with approximately 30 million residing in the three East African nations surrounding the lake.

¹²⁶ Okungu, J.O., S. Njoka, J.O.Z. Abuodha, and R.E. Hecky. Lake Victoria Environment Management Project (LVEMP). Accessed May 8, 2023. <http://hdl.handle.net/1834/7140>.

¹²⁷ Ibid.

Miriti avers that Lake Victoria harbors the most extensive freshwater fishery globally, which plays a vital role in bolstering economies of the East African nations that rely on it. The fishery produces an estimated 1 million tons of fish annually and provides employment for around 200,000 people. Moreover, the fishery supports sustenance to approximately 4 million individuals who depend on it for food and income.¹²⁸

Similarly, Lake Victoria supports the economies of Kenya and Uganda through its thriving fishing industry. The lake is home to over 500 species of fish, including Nile perch, which is an important fish species in the lake.¹²⁹ Nile perch is exported to Europe and other countries, generating significant foreign exchange for the countries. In Uganda, for example, fish exports from Lake Victoria were worth over \$143 million in 2019.¹³⁰ The fishing industry also provides employment for thousands of people in both countries, supporting the livelihoods of local communities.

The lake continues to perform a vital duty in the transportation of goods, particularly between Uganda and Kenya. This is evident from Kenya's construction of an oil jetty in 2019 and a ship, MV Uhuru with a capacity of 500 tonnes in 2020 to facilitate the transportation of oil from the Kisumu refinery to Uganda, as well as to provide a loading and offloading point for other cargo and goods.¹³¹ The jetty moreover, is expected to increase trade between Kenya and Uganda, as well as other countries in the region.

¹²⁸ Evans A.K. Miriti, "Lake Victoria," African Great Lakes Information Platform, accessed 8 May 2023, <https://www.africangreatlakesinform.org/article/lake-victoria>.

¹²⁹ J. S. Balirwa et al., "The Management of Fisheries and Aquaculture in Uganda," in Lake Victoria Fisheries Resources Research Institute, Annual Report for the year 2000, 15-16.

¹³⁰ United Nations Conference on Trade and Development, "Uganda: Enhancing Export Competitiveness through Trade Facilitation Reform," accessed May 8, 2023, https://unctad.org/system/files/official-document/ditccipc2018d3_en.pdf.

¹³¹ P. Wanyonyi, "Kenya Launches New Oil Jetty in Kisumu," The EastAfrican, May 2, 2019, <https://www.theeastafrican.co.ke/tea/business/kenya-launches-new-oil-jetty-in-kisumu-1415860>.

Lake Victoria moreover, supports agriculture, with several irrigation projects along its shores of Kenya and Uganda. The lake is a source of water for domestic and industrial purposes, and it also aids the generation of hydroelectric power. For example, the Owen Falls Dam on the Nile River, emanating from the outflow of Lake Victoria, generates electricity for Uganda.¹³²

3.2. Treaties and institutions for the Management and Sustainable Development of Lake Victoria

3.2.1. East Africa Community

The integration efforts of East African nations dates back to the colonial period, but it wasn't until 1897 when the building of the Kenya-Uganda Railway stamped the beginning of amalgamation of economic and social aspects. The first East African Community was established in the year 1967, but unfortunately, its existence was short-lived, lasting no more than a decade, collapsing and dissolving in the year 1977.¹³³

The collapse of the initial attempt at the East African Community (EAC) was primarily caused by a significant imbalance in the distribution of benefits among its members. This disparity arose from varying levels of development among the participating states and the absence of effective policies to address these discrepancies. Despite this setback, determined efforts to revive the EAC persisted, leading to the signing of the Treaty for its reestablishment in November 1999. Kenya, Uganda, and Tanzania were the signatories of this treaty, which subsequently came into force in the year 2000.¹³⁴

¹³² Uganda Electricity Generation Company Limited, "Owen Falls Dam," accessed May 8, 2023, <https://www.uegcl.com/owen-falls-dam/>.

¹³³ East African Community, "About EAC," East African Community, accessed May 11, 2023, <https://www.eac.int/about-eac>.

¹³⁴ Ibid.

In 2007, Rwanda and Burundi expressed their keen interest in becoming part of the community, and they were subsequently welcomed as members in the same year. South Sudan and Congo have also joined in 2011 and 2022 respectively. Today, EAC has earned worldwide recognition as a dynamic regional economic community. Its appeal is evident from the enthusiastic interest shown by neighboring countries like Sudan and Somalia, who are keen on becoming members.¹³⁵

The East African Community (EAC) has made significant strides in the peace and security sector by developing and creating protocols and mechanisms that have facilitated the establishment of a conflict resolution plan. The EAC has endorsed multiple agreements, including ones on foreign policy harmonization, defense collaboration, and peace and stability. Kenya and Burundi have already validated the accord on Foreign Policy Coordination. The other two policies are in process of ratification by members. These protocols, once ratified, become essential elements of the treaty that formed the foundation of the EAC, ensuring a standardized approach to conflict resolution.¹³⁶

Moreover, the EAC has established in its treaty a technique for an early warning system and conflict prevention, management, and resolution. With these measures in place, the EAC has been able to create a conducive environment for the resolution of disputes, leading to enhanced regional stability and prosperity.¹³⁷

The EAC's success in the peace and security sector can be attributed to its commitment to developing and implementing effective protocols and mechanisms that prioritize the needs of its member states. This has helped to foster a spirit of cooperation and mutual understanding among member states, enabling them to work together towards a common goal. As the EAC continues to

¹³⁵ Ibid.

¹³⁶ Article 151, EAC Treaty

¹³⁷ Ibid

develop and strengthen its peace and security framework, it is essential that member states remain committed to upholding the principles of the EAC Treaty, ensuring that the benefits of integration are felt by all.¹³⁸

3.2.2. The EAC Treaty and the LVBC Protocol

The Lake Victoria Basin is primarily governed by agreements that are categorized within institutional framework of EAC, an intergovernmental body consisting of South Sudan, Burundi, Kenya, Democratic Republic of Congo, Rwanda, Tanzania, and Uganda. The EAC's main objective is to promote cooperation among its Partner States in various areas such as defense, economics, legal, research and technology, Politics, security, culture, and judicial affairs, for their reciprocal benefit. This organization was founded on 30th November 1999, in Arusha, Tanzania, through the ratification of the Treaty for the Establishment of the EAC Treaty.¹³⁹

The member states reached a consensus to work collaboratively to ensure the execution of sustainable environmental stewardship strategies. Specifically, they committed to reinforcing cooperation in the development of shared water quality programs and measures to reduce and regulate environmental and natural resource degradation. They also acknowledged the importance of creating unified strategies to encourage responsible land use practices and prevent desertification. Furthermore, the parties emphasized the need to promote efficient water usage and implement flood control initiatives. Regarding fisheries, the member states assented to undertake stock assessments and decide the maximum viable harvest.¹⁴⁰

¹³⁸ Ibid.

¹³⁹ Lake Victoria Basin Commission and the Lake Victoria Basin Resource Management Strategy Coordination Unit, "Legal Frameworks," International Waters Learning Exchange and Resource Network, accessed May 9, 2023, <https://iwlearn.net/documents/legal-frameworks/lake-victoria-basin-commission-and-the-lake>.

¹⁴⁰ C.O. Okidi, "Legal and Institutional Aspects of Management of the Environment in Lake Victoria Basin," in United Nations Environment Programme (UNEP), Pan African START Secretariat (PASS), accessed May 9, 2023, <http://hdl.handle.net/1834/7370>.

As per the provisions of Article 114(2) (b) (VI) of the EAC Treaty, the Member countries came to a consensus to create a governing entity that would be responsible for governance of Lake Victoria. To fulfill this objective, LVBC Protocol was adopted and signed on 29 November 2003, and subsequently ratified in December 2004, thus leading to establishment of Lake Victoria Basin Commission (LVBC).¹⁴¹

Moreover, Article 47 of the LVBC Protocol regulates the nexus between the LVBC Protocol and the EAC Treaty, affirming that the former is an essential component of the latter. In case of any contradictions between the two, the EAC Treaty will take precedence. Moreover, as per the LVBC Protocol, its provisions will supersede any other previous assent related to Lake Victoria. In the event of any conflicts between the LVBC Protocol and other agreements, the latter will be considered invalid to the extent of their inconsistency with the LVBC Protocol.¹⁴²

3.2.3. Lake Victoria Fisheries Organization (LVFO)

The sole fisheries agreement that applies to Lake Victoria is the Convention for the Establishment of the LVFO, which was ratified by Kenya, Tanzania, and Uganda on 30th June 1994 at Kisumu in Kenya.¹⁴³ The formation of the organization was made possible by financing from various sources, including the three East African nations, the Food and Agriculture Organization (FAO), the European Union (EU), the World Bank, and the Global Environment Facility (GEF). The primary role of the organization is to improve collaboration and partnership with institutions and stakeholders to enhance the viable use of Lake Victoria's fisheries resources and foster the

¹⁴¹ Lake Victoria Basin Commission and the Lake Victoria Basin Resource Management Strategy Coordination Unit, "Legal Frameworks," International Waters Learning Exchange and Resource Network, accessed May 9, 2023, <https://iwlearn.net/documents/legal-frameworks/lake-victoria-basin-commission-and-the-lake>

¹⁴² Ibid.

¹⁴³ C.O. Okidi, "Legal and Institutional Aspects of Management of the Environment in Lake Victoria Basin," in United Nations Environment Programme (UNEP), Pan African START Secretariat (PASS), accessed May 9, 2023, <http://hdl.handle.net/1834/7370>.

socioeconomic development of the communities living along the shoreline. Additionally, the organization is responsible for enhancing the lake's ecosystem.¹⁴⁴

3.2.4. The Lake Victoria Fisheries Research Project (LVFRP)

The LVFRP was established in 1997 as an initiative aimed at supporting the LVFO in effectively managing the fisheries of the lake. The project's primary objective was to develop an inclusive plan that would ensure the viable use and governance of the lake's resources.¹⁴⁵

One of the key aspects of the LVFRP is the rehabilitation and construction of research vessels that could facilitate the collection of critical data on the situation of the lake's fisheries. In addition to this, the LVFRP also aimed to conduct stock assessments, which would provide important insights into the health and sustainability of the lake's fish populations.¹⁴⁶

To support these efforts, the LVFRP also worked towards equipping research institutes with the necessary tools and resources to train fisheries researchers in the region. By building the capacity of local research institutions, the LVFRP aimed to create a sustainable and locally-driven approach to the governance of the lake's fisheries.¹⁴⁷

Another important aspect of the LVFRP is the examination of socio-economic issues associated with the lake and its fisheries. By understanding the various economic and social factors that impact the utilization and governance of the lake's resources, the LVFRP aimed to develop effective policies and strategies that would benefit both the local communities and the wider region.¹⁴⁸

¹⁴⁴ Awange, Joseph L., and Obiero Ong'ang'a. Lake Victoria: Ecology, Resources, Environment. Springer-Verlag Berlin Heidelberg, 2006.

¹⁴⁵ Ibid.

¹⁴⁶ Ibid.

¹⁴⁷ Ibid.

¹⁴⁸ Ibid.

3.2.5. Partnership Agreement

The Partnership Agreement on the Promotion of Sustainable Development in Lake Victoria, which was signed in April 2001 between the governments of Sweden, France and Norway, the World Bank, the East African Development Bank (EADB) and the EAC, is one of several key treaties aimed at promoting sustainable development in the Lake Victoria region. Finland later joined the Partnership Agreement in September 2010, further demonstrating the global interest in the sustainable development of the region.¹⁴⁹

The Partnership Agreement aims to lay out a plan for promoting sustainable development in Lake Victoria Basin, with a particular focus on supporting economic growth, improving social welfare, and protecting the environment. To achieve these objectives, the Partnership Agreement provides for mobilization of monetary resources, technical assistance, and other forms of support from the signatory parties. By working together, the signatories hope to enhance viable development in the region in a coordinated and effective manner.¹⁵⁰

3.2.6. The Nile Basin Initiative (NBI)

NBI was established to manage the Nile River Basin, which includes Lake Victoria as its source. In 2006, the EAC ratified a pact with the NBI to promote the effective governance of the Lake Victoria Basin.¹⁵¹

¹⁴⁹ Lake Victoria Basin Commission and the Lake Victoria Basin Resource Management Strategy Coordination Unit, "Legal Frameworks," International Waters Learning Exchange and Resource Network, accessed May 9, 2023, <https://iwlearn.net/documents/legal-frameworks/lake-victoria-basin-commission-and-the-lake>

¹⁵⁰ Ibid.

¹⁵¹ Ibid.

3.2.7. The diplomatic cooperations between Kenya and Uganda

Okoth posits that Kenya and Uganda have diplomatic cooperation history that dates back to the colonial period when both countries were under British rule. Uganda was part of the British East African Protectorate until 1962 when it gained independence, while Kenya gained independence in 1963. During the colonial period, Uganda was used as a labor reserve for Kenya's settler economy. This led to the migration of Ugandans to Kenya, which created tensions between the two countries. Moreover, the uneven development between Kenya and Uganda led to intermittent tensions. The British colonial administration focused more on developing Kenya's infrastructure and economy compared to Uganda, creating a sense of disparity. This imbalance persisted even after the countries gained independence and formed the EAC, which aimed to promote regional cooperation. However, the two countries maintained cordial relations during the colonial period.¹⁵²

Okoth further postulates that after gaining independence, the early years were marked by cooperation between the two countries. EAC was founded in 1967 to promote economic cooperation between Kenya, Uganda, and Tanzania. The EAC was successful in promoting trade, investment, and free movement of people and goods between the member countries.¹⁵³

Economic cooperation has worked in tandem with trade which has been a significant component of Kenya-Uganda relations, although it has been characterized by occasional frictions. Kenya has consistently enjoyed a trade surplus over Uganda, which has led to tensions between the two countries. The trade disparities have been attributed to differences in economic structures and capacity, with Kenya having a more diversified and developed economy. However, despite the challenges, trade ties have also fostered collaboration and partnerships in the region. For instance,

¹⁵² Godfrey P. Okoth, "Intermittent Tensions in Uganda-Relations: Historical Perspectives," *Transafrican Journal of History* 21 (1992): 69-92, accessed May 10, 2023, <https://www.jstor.org/stable/24520421>.

¹⁵³ Ibid

joint initiatives have been undertaken to promote cross-border trade, investment, and the development of regional value chains, aiming at achieving mutual economic growth and integration.¹⁵⁴

Kenya and Uganda have equally had a history of security cooperation, particularly in military affairs. The two countries have jointly participated in peacekeeping missions, such as the African Union Mission in Somalia (AMISOM), where they have worked together to stabilize and bring peace to the region. They have also collaborated in counter-terrorism efforts, sharing intelligence and conducting joint operations to combat terrorist groups. This security cooperation has not only strengthened bilateral ties but has also contributed to improved regional stability and security.¹⁵⁵

Kenya-Uganda cooperation extend beyond politics and economics, encompassing education and cultural exchanges. Both countries have collaborated on initiatives aimed at promoting knowledge sharing, capacity building, and student exchanges. Scholarships and academic programs have been established to facilitate the mobility of students between universities in Kenya and Uganda, fostering greater understanding and appreciation of each other's culture, history, and values. These educational and cultural exchanges have contributed to strengthening people-to-people ties and promoting regional integration.¹⁵⁶

The Nairobi Peace Talks of 1985 in which Kenya played a key role in mediating peace talks between the government of Uganda and the National Resistance Army (NRA) rebels led by Yoweri Museveni led to the signing of the Nairobi Peace Agreement, which ended the conflict in

¹⁵⁴ Ibid.

¹⁵⁵ Ndirangu, J. G. "Border Diplomacy and Territorial Disputes in the IGAD Region: A Case Study of Kenya." PhD thesis, Strathmore University, 2020. <http://hdl.handle.net/11071/12080>.

¹⁵⁶ Godfrey P. Okoth, "Intermittent Tensions in Uganda-Relations: Historical Perspectives," *Transafrican Journal of History* 21 (1992): 69-92, accessed May 10, 2023, <https://www.jstor.org/stable/24520421>.

Uganda. The peace agreement was a significant achievement for Kenya and helped to strengthen its role as a regional mediator and strengthening its diplomatic cooperation with Uganda.¹⁵⁷

Moreover, in 2000, Kenya, Tanzania, and Uganda ratified the East African Cooperation Treaty to revive the EAC. The treaty aimed to promote regional economic integration, social and political cooperation between the member countries. The revival of the EAC was a significant achievement for Kenya and Uganda and has helped to promote regional stability, more cooperation and development.¹⁵⁸

3.3. Conclusion

Transboundary Natural Resources Management (TBNRM) of Lake Victoria has played a critical role in promoting cooperation, resolving conflicts and enhancing diplomatic relations. The sustainable use and management of the lake's resources have been made possible through the joint efforts of both countries, regional organizations and treaties such as the EAC, the NBI, LVBC, LVFO and LVFRP. Despite the historical challenges in the diplomatic cooperation between Kenya and Uganda, the shared goal of sustainable governance of Lake Victoria has brought the two countries together in a collaborative effort towards a common goal. It is evident that effective management of shared natural resources such as Lake Victoria is crucial in promoting regional cooperation, and the TBNRM approach provides a practical framework for achieving this. The success of TBNRM in promoting cooperation, resolving conflicts and ultimately improving diplomatic relations over Lake Victoria should serve as a model for other regions in Africa and beyond, to ensure the sustainable use and management of shared natural resources.

¹⁵⁷ Ibid

¹⁵⁸ Ibid.

CHAPTER FOUR

Challenges experienced in TBNR of Lake Victoria between Kenya and Uganda

4.1. Introduction

This chapter builds upon the previous two chapters, which introduced the concept of TBNR while emphasizing the importance of diplomatic cooperation in managing shared resources and discussing the role of diplomatic cooperation between Kenya and Uganda in resource management with a focus on Lake Victoria as a case study respectively. The chapter delves into the various challenges encountered in the TBNRM of Lake Victoria, specifically focusing on the context between Kenya and Uganda. By examining these challenges, we aim to gain a comprehensive understanding of the obstacles that have hindered effective TBNRM efforts in this region. This chapter serves as a continuation of our exploration, bridging the gap between the previous chapters and paving the way for the subsequent discussions on potential solutions and recommendations. The chapter encompasses various ecological thematic areas, including effects of climate change, water quality and pollution, challenge posed by water hyacinth, decline of biodiversity and fisheries.

4.2. Gender of the study respondents

In order to effectively cover challenges on ecological thematic areas like the impacts of climate change, water quality and pollution, the study took into consideration gender as a major aspect of demographic. It did so because different genders not only have their unique perspectives of environmental, social, political and economic events, but are also affected by them.

The researcher initially engaged a total of 104 participants anticipating their full participation, which would translate to a response rate of 100%. However the actual turn-out was 75 participants, representing a response rate of 72.1%. The researcher acknowledged that the difference, between the actual response rates could impact the findings of this study. ¹⁵⁹From the sample of respondents engaged 47 were male and 28 were female bringing their percentages to 62.67% and 37.33 respectively. This illustrates that individuals from both genders gave their independent opinions on the issues under survey therefore they were fairly represented as shown in the pie chart in figure 4 below.

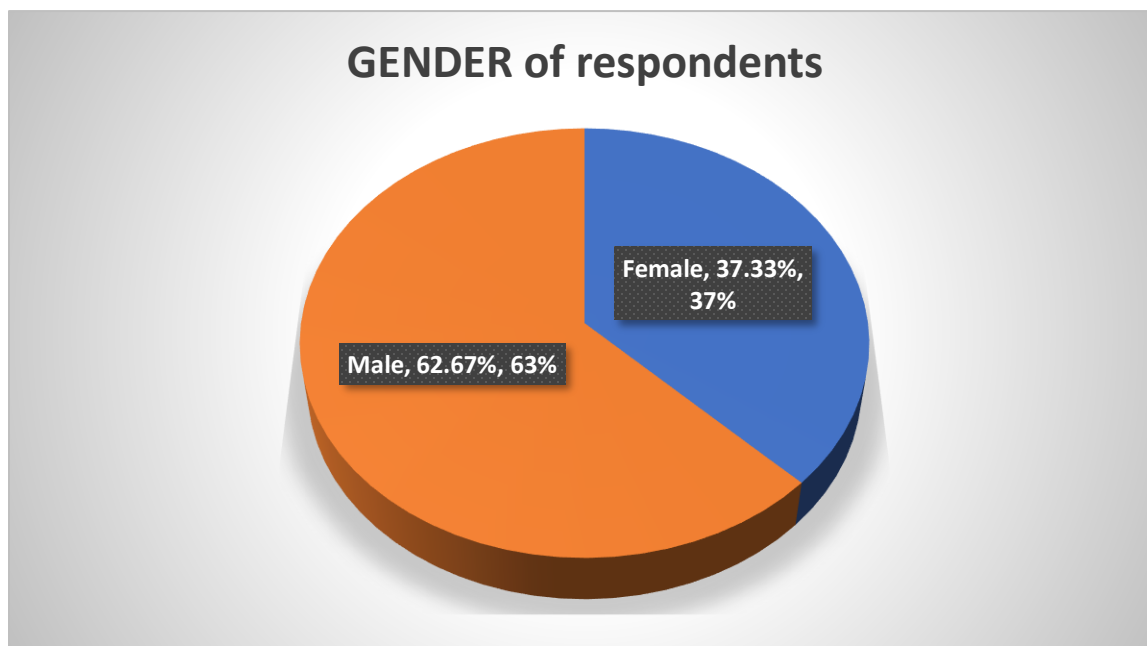


Figure 4. Gender distribution

¹⁵⁹ There are factors that could have influenced the response rate being lower than expected. Some possible reasons include complexity of the survey for some respondents especially the local fisher men, most of whom are illiterate and required translators. The time when the data was collected may have not been right for some respondents who needed more time to fill the questionnaires.

4.3. Age distribution

To give the sample more representation and to avoid biases the study also incorporated age range to give a snapshot of the demographics. Age would bring diverse experiences of various samples and bring out important context for interpreting and discussing the study findings.

From the data in figure 5 below, 9% of the participants were in the age bracket of between 55-64 years, 15% of the participants were in the age bracket of 45-54 years, 20% were in the age bracket of 18-24 years, 25% were between 35-44 years and finally 31% were between 25-34 years. This kind of age distribution brought diverse responses to the survey from different age experiences.¹⁶⁰

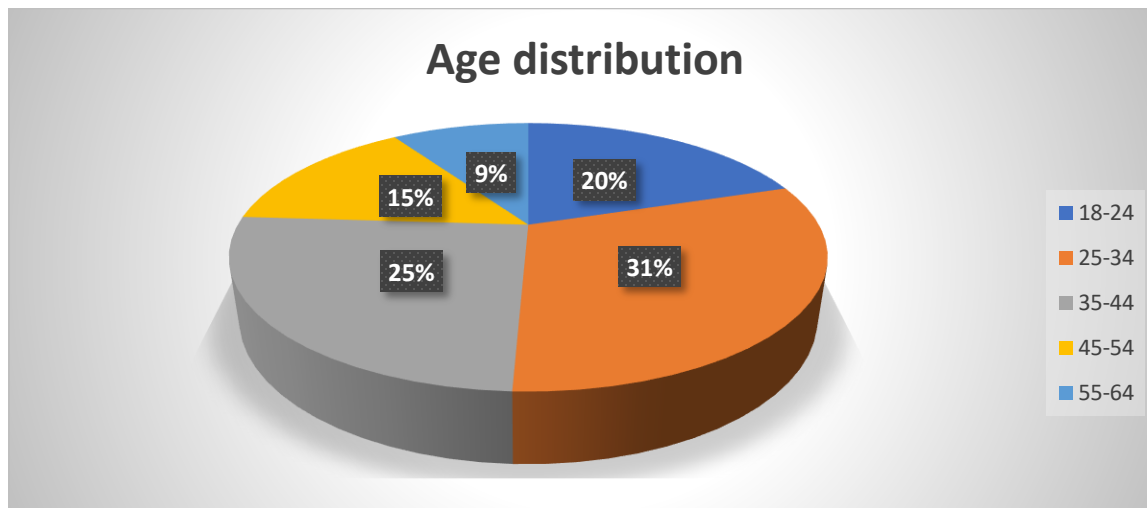


Figure 5. Age distribution

¹⁶⁰ The researcher acknowledged that in as much as the sample provided may represent a range of age groups, the proportions shown may not perfectly reflect the broader population. In addition, the researcher's use of surveys as a data collection method could have affected the sample composition. Finally, recognizing the possibility of variations, in responses, across generations may lead to a nuanced understanding of the findings.

4.4. Challenges experienced in TBNR of Lake Victoria between Kenya and Uganda.

With regard to the question on the major challenges faced in the transboundary natural resource of Lake Victoria between Kenya and Uganda, the findings of the study revealed that pollution is the main challenge facing the Lake with 31% of the respondents in agreement. Water hyacinth menace comes second among the major problems facing the lake as represented by 23% of the total respondents. This is then followed by climate change as equally a major problem experienced in the lake as represented by 19% of respondents. Decline of biodiversity, soil erosion and destruction of habitat respectively also affects the lake as shown by 12%, 9% and 6% of respondents in figure 6 below.¹⁶¹

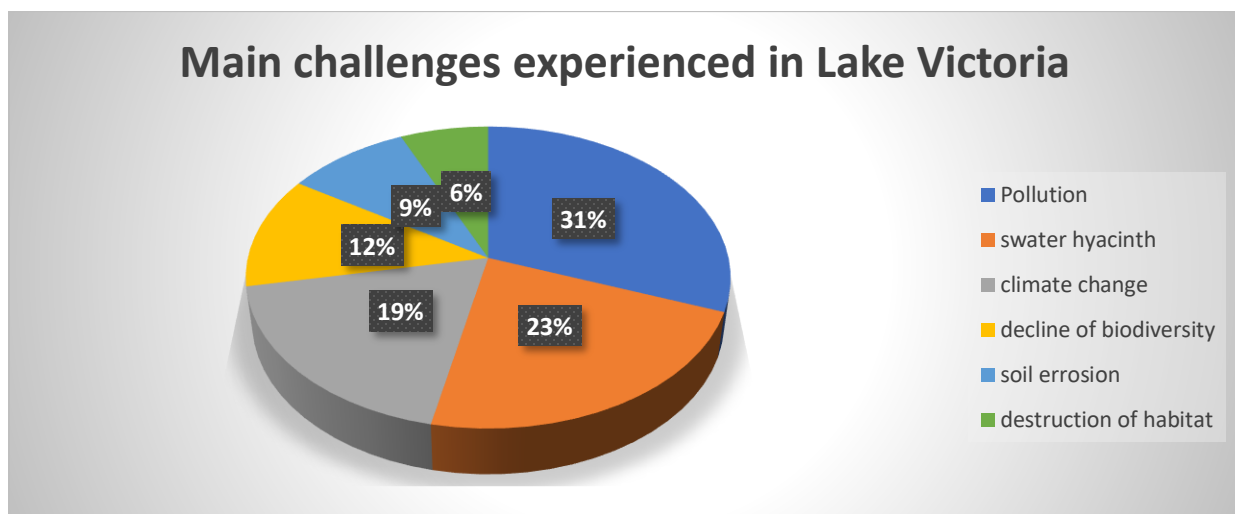


Figure 6. Challenges experienced in Lake Victoria

¹⁶¹ The researcher's identification of pollution as a major problem affecting Lake Victoria reveals its intricate nature. Pollution ranges from industrial processes, agricultural practices and human activities that affect water quality, aquatic life the ecosystem at large.

-The researcher's acknowledgement of water hyacinth as a challenge facing the lake speaks to the extent of its infestation. The sea weed can obstruct waterways, deplete oxygen, and interfere with aquatic habitats.

-The researcher also identified climate change as a challenge and this finding aligns with global concerns of climate change on fresh water bodies. Climate change causes rising water temperatures, extreme events and altered precipitation patterns which can affect the lakes delicate balance.

-Loss of biodiversity as a challenge speaks to the need of conserving the lake's aquatic biodiversity to avoid ecological imbalance and reduced food sources.

-The researcher identified erosion as a challenge affecting habitat quality and water clarity.

- The researcher also recognized habitat degradation can lead to habitat loss, affecting species that depend on specific ecological niches for survival.

4.4.1. Climate Change

Effects on lake levels and water availability

The Lake Victoria Basin stands as a dynamic ecosystem where the impacts of climate change are becoming increasingly evident. Human activities, intertwined with natural processes, have led to significant changes in the climate system, with far-reaching consequences. The relentless growth of population and expanding economy exert mounting pressure on the LVB's precious natural resources, including water, wetlands, forests, pastoral lands, and fish reserves. Regrettably, the management of these escalating demands has fallen short, resulting in profound environmental degradation across the basin. This degradation manifests in the form of water scarcity, compromised water quality, and disruptions to vital ecosystems and biodiversity.¹⁶²

Among the pressing concerns within the LVB, the effects of climate change on lake levels and water availability loom large. Recent years have witnessed a shifting climate pattern, marked by a discernible decline of 10-40% in precipitation since 1960, instilling concerns about future reductions in rainfall and the onset of higher air temperatures.¹⁶³ Such changes reverberate through the hydrological cycle, temperature balance, and rainfall patterns, leaving an indelible mark on the water systems of the basin. Lake Victoria, already grappling with a 0.5°C temperature rise since the 1960s, faces further warming in East Africa and the LVB according to consistent climate projections.¹⁶⁴ By 2050, annual mean temperatures could potentially soar by 0.5 to 3°C, with the

¹⁶² The World Bank, Report No: 148631 - AFR, 'Towards Climate Resilient Environmental and Natural Resources Management in the Lake Victoria Basin' (Washington DC: The World Bank, June 2020), accessed May 18, 2023, <http://www.worldbank.org>.

¹⁶³ Janet Nassali et al., "A Systematic Review of Threats to the Sustainable Utilization of Transboundary Fresh Water Lakes: A Case Study of Lake Victoria," *International Journal of Scientific and Research Publications* 10, no. 2 (February 2020): 657, accessed May 18, 2023, <http://dx.doi.org/10.29322/IJSRP.10.02.2020.p9890>.

¹⁶⁴ Ibid.

most pessimistic scenario pointing to a worrisome surge of 3 to 5°C by 2090, as revealed by the Representative Concentration Pathway (RCP8.5) projections.¹⁶⁵

Scientific consensus, as highlighted by the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report, underscores the likelihood of more intense and frequent extreme precipitation events in wet tropical areas within a warmer climate. These projections parallel the anticipated increase in extreme rainfall within the LVB, as evidenced by events like the recurrent El Niño rains. The ramifications of these shifting weather patterns reverberate across multiple sectors, from agriculture and water resource management to energy production and public health. Simultaneously, the basin's precious ecosystems bear the brunt, as alterations in aquatic biodiversity, the relentless increase of invasive species, and shifts in the timing and intensity of biological events become a stark reality.¹⁶⁶

A historical analysis of Lake Victoria's variations, as studied by Nicholson, unveils a pattern of change over time. The lake has experienced a series of fluctuations since the early 19th century, with episodes of low water levels, followed by peak levels in the late 1870s. Subsequently, it dwindled to levels akin to those witnessed in the 20th century, albeit with intermittent spikes during the early 1890s. Throughout the 20th century, the lake consistently maintained low water levels, except for a notable surge from 1961 to 1962 that set the stage for enduring high levels.¹⁶⁷

Mistry and Conway's study delving into the climatic factors influencing the rise in lake levels reveals a robust correlation between rainfall patterns in the lake area and the corresponding

¹⁶⁵ The World Bank, Report No: 148631 - AFR, 'Towards Climate Resilient Environmental and Natural Resources Management in the Lake Victoria Basin' (Washington DC: The World Bank, June 2020), accessed May 18, 2023, <http://www.worldbank.org>.

¹⁶⁶ Ibid.

¹⁶⁷ S. Y. Phoon, A. Y. Shamseldin, and K. Vairavamoorthy, "Assessing impacts of climate change on Lake Victoria Basin, Africa," in Proceedings of the 30th WEDC International Conference, Vientiane, Lao PDR, 2004, PEOPLE-CENTRED APPROACHES TO WATER AND ENVIRONMENTAL SANITATION.

fluctuations in water levels. Additionally, it sheds light on an interval of 1 to 2 years between instances of rainfall and subsequent peaks in lake water levels.¹⁶⁸

The potential socio-economic implications stemming from these transformations are staggering. Water scarcity and the fluctuations in lake levels pose formidable challenges to agriculture, fisheries, and the livelihoods of local communities. Moreover, the altered weather patterns in the LVB ripple beyond its immediate boundaries, exerting influence on regional and global climate systems. These cascading effects manifest through changes in atmospheric circulation patterns and precipitation regimes, amplifying the stakes in the fight against climate change.¹⁶⁹

Main Sources Water Pollution In Lake Victoria

Industrial Pollution

With regard to the question on the main sources of pollution in Lake Victoria, it becomes apparent from the research findings that industrial pollution is the major source of pollution as represented by 70% of the respondents. The findings show that through industrial pollution, Mercury, lead, cadmium, and organic compounds find their way into Lake Victoria.

Over the past three decades, rapid urbanization, industrial expansion, and intensified agricultural practices in the Lake Victoria region have significantly amplified the inflow of nitrogen and phosphorus into the lake, exacerbating water quality degradation. Urban centers and industrial zones, such as Kampala, Entebbe, Masaka, Jinja, Mwanza, Musoma, and Kisumu, act as pivotal pollution hotspots, releasing untreated or inadequately treated wastewater directly into the lake via storm water drains and wetlands. This negligent discharge fuels the rampant growth of algal

¹⁶⁸ Ibid.

¹⁶⁹ Ibid.

blooms, impeding sunlight penetration and exacerbating oxygen-depleted conditions detrimental to aquatic plants and fish populations.¹⁷⁰

Agricultural Pollution

Evidently, the investigation demonstrates that agricultural pollution is the second source of pollution as represented by 20% of the total respondents. Agricultural pollution emits nitrates, phosphates, pesticides, and herbicides into the Lake Victoria. The runoff originating from pastoral and agricultural lands, shrub lands, forests, and densely populated urban settlements contributes significantly to the decline in Lake Victoria's water quality. These runoff waters carry not only high levels of nutrients but also mycobacteria, further intensifying the pollution burden. The improper implementation of land management practices, such as inadequate soil erosion control, amplifies sediment accumulation in the lake, with rivers like the Kagera being the primary contributors. Atmospheric deposition, predominantly through phosphorus and nitrogen, constitutes another substantial source of nutrient loading in Lake Victoria.¹⁷¹

Domestic Pollution- Eutrophication and Nutrient Runoff

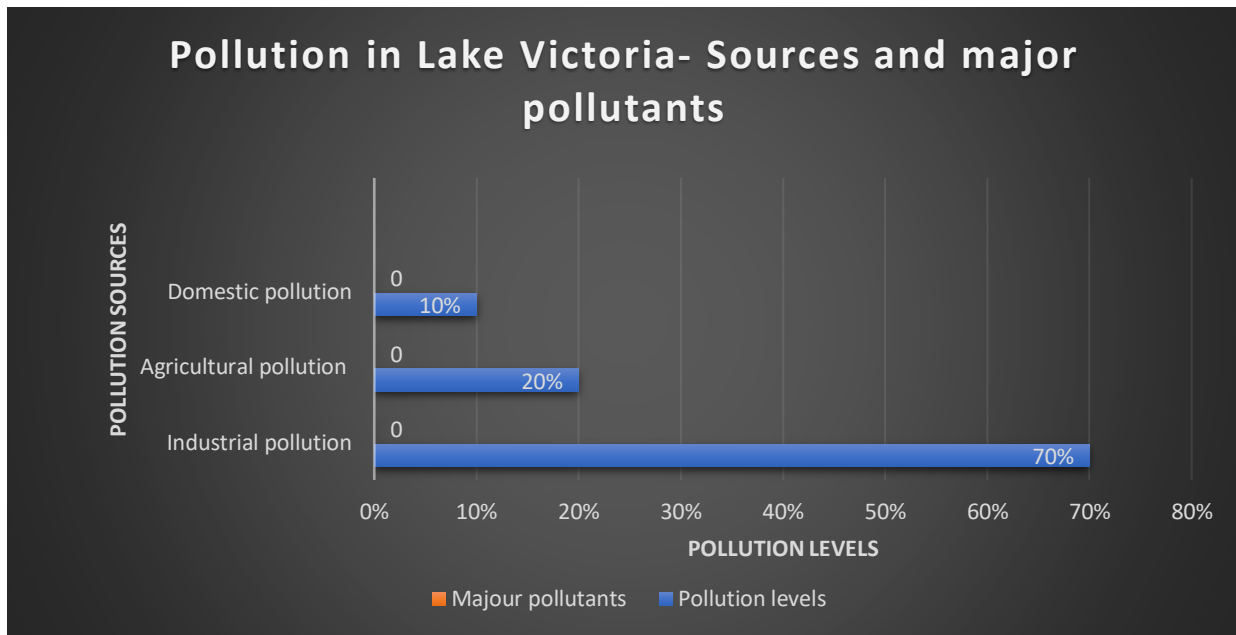
In light of the study it can be concluded that domestic pollution is the least source of pollution as only a paltry 10% of the respondents were in support. Domestic pollution emits nutrients, chemicals, and organic matter into the Lake. The accelerating human population and its related undertakings have expedited the process of eutrophication in Lake Victoria. Intensified land use practices, escalating human and livestock populations in the lake's vicinity and neighboring islands have led to increased nutrient runoff into the lake. The combined effects of agricultural runoff,

¹⁷⁰ Janet Nassali et al., "A Systematic Review of Threats to the Sustainable Utilization of Transboundary Fresh Water Lakes: A Case Study of Lake Victoria," *International Journal of Scientific and Research Publications* 10, no. 2 (February 2020): 657, accessed May 18, 2023, <http://dx.doi.org/10.29322/IJSRP.10.02.2020.p9890>.

¹⁷¹ East African Community Lake Victoria Basin Commission, "Regional Transboundary Diagnostic Analysis of the Lake Victoria Basin" (March 2007)

urban effluents, and atmospheric deposition have disrupted the delicate nutrient balance, fueling the proliferation of algal blooms and degrading water quality.¹⁷²

These excessive nutrient loads have inflicted profound impacts on the lake's ecosystem. The surge in algal blooms, particularly filamentous and colonial blue-green algae, has witnessed a dramatic upsurge since the 1960s, creating hypoxic conditions that periodically result in fish mortalities. The conversion of extensive vegetation cover, including wetlands and forests, for various purposes, has contributed to an amplified influx of nutrients from non-point sources, aggravating the overall pollution predicament.¹⁷³



Industrial pollution: Mercury, lead, cadmium, organic compounds

Agricultural pollution: Nitrates, phosphates, pesticides, herbicides

Domestic pollution: Nutrients, chemicals, organic matter

Figure 7. Sources of pollution and major pollutants

¹⁷² Ibid.

¹⁷³ Janet Nassali et al., "A Systematic Review of Threats to the Sustainable Utilization of Transboundary Fresh Water Lakes: A Case Study of Lake Victoria," *International Journal of Scientific and Research Publications* 10, no. 2 (February 2020): 657, accessed May 18, 2023, <http://dx.doi.org/10.29322/IJSRP.10.02.2020.p9890>.

Impact of pollution on Aquatic Life and Human Health

The consequences of pollution and eutrophication in Lake Victoria reverberate throughout the aquatic ecosystem and pose risks to human health. The rampant algal blooms, with their toxic byproducts, render the water unsuitable for consumption by humans and livestock. Additionally, the presence of mycobacteria in the runoff waters poses a potential health hazard.¹⁷⁴

The deterioration of water quality and the proliferation of algal blooms disrupt the ecological balance and threaten the survival of aquatic life. The dominance of filamentous and colonial blue-green algae impedes the availability of oxygen, leading to fish mortality events. The conversion of natural habitats and the encroachment of human activities further compound the adverse impacts, amplifying the decline of water quality and compromising the overall biodiversity of the lake.¹⁷⁵

4.4.2. Water hyacinth

Introduction and Spread of Water Hyacinth

Water hyacinth (*Eichhornia crassipes*) has earned a notorious reputation as the most troublesome aquatic plant worldwide, wreaking havoc on ecosystems and economies alike. Its destructive potential became apparent when it was officially identified in Lake Kyoga in May 1988. Subsequently, this invasive plant rapidly propagated, infesting the shores of Lake Victoria in Uganda and Tanzania in 1989 and reaching the Kenyan side in 1990. The Kagera River in Rwanda experienced its invasion in 1991. Adding to the complexity, the seasonal flushing of water hyacinth from the floodplains of the River Kagera exacerbates the challenge by continuously introducing massive amounts of biomass and debris into Lake Victoria.¹⁷⁶

¹⁷⁴ Ibid.

¹⁷⁵ Ibid.

¹⁷⁶ Thomas Albright et al., "The Abundance and Distribution of Water Hyacinth in Lake Victoria and the Kagera River Basin, 1989-2001," (Sioux Falls, SD: U.S. Geological Survey/EROS Data Center, Raytheon, Clean Lakes, Inc., Nile International Conference Centre, Kampala, Uganda, March 2007).



Figure 8. Water Hyacinth in Lake Victoria

Source: Nile Basin Discourse

Ecological and Economic Impacts of Water Hyacinth

The rampant growth of water hyacinth in Lake Victoria reached its zenith in 1998, leaving behind profound socio-economic and environmental consequences that are yet to be fully quantified. This invasive weed thrives with astonishing speed, obstructing waterways, hydropower generation plants, and water extraction facilities. Its prodigious production of long-lived seeds capable of remaining viable for up to three decades allows its populations to double every 5-15 days under favorable temperatures of 25-27.5°C. Consequently, a permanent floating fringe forms, displacing native species such as *Pistia stratiotes*, which typically flourishes in the productive interface between wetlands and open water. This disruption of the ecological balance alters the intricate food web and poses a threat to biological diversity, amplifying the ecological impacts.¹⁷⁷

¹⁷⁷ Sixtus Kayombo* and Sven Erik Jorgensen, "Lake Victoria Experience and Lessons Learned Brief"

The economic consequences of water hyacinth infestation are equally significant. The dense mats of vegetation impede light penetration, deplete oxygen levels, and disturb natural habitats, leading to the decline of aquatic organisms and the loss of biodiversity. The detrimental effects extend to the livelihoods of local communities heavily reliant on fishing, as the invasive weed causes a sharp decline in fish catches, compromising food security and income stability. The obstructed transportation routes and increased operational costs associated with navigating through water hyacinth-infested areas add further strain to commercial activities and tourism, hindering economic growth and development. These detrimental consequences significantly affect the ecosystem and local economies, warranting urgent attention and comprehensive management strategies ¹⁷⁸

Water Hyacinth Control and Management Strategies

To address the water hyacinth challenge, comprehensive control and management strategies have been deployed. Initially, efforts focused on manual removal and public awareness campaigns in the early 1990s. However, the sheer weight of water hyacinth, often exceeding 400 tons per hectare, limited the effectiveness of these manual removal endeavors.¹⁷⁹

Under the Lake Victoria Environmental Management Project (LVEMP), significant progress has been achieved in mitigating the spread of water hyacinth, with infestation levels decreasing by approximately 78% across the lake. A combination of physical and biological methods has been employed to combat the proliferation of the weed. Notably, the implementation of biological control measures utilizing two species of weevils, *Neochetina eichhornia* and *Neochetina bruchi*, has shown promising results. These weevils have proven effective in suppressing water hyacinth

¹⁷⁸ Ibid.

¹⁷⁹ Thomas Albright et al., "The Abundance and Distribution of Water Hyacinth in Lake Victoria and the Kagera River Basin, 1989-2001," (Sioux Falls, SD: U.S. Geological Survey/EROS Data Center, Raytheon, Clean Lakes, Inc., Nile International Conference Centre, Kampala, Uganda, March 2007).

populations. An integral aspect of the biological control strategy has been the active involvement of local fishing communities, who have actively participated in rearing and distributing the weevils, contributing to the program's success.¹⁸⁰

However, addressing the water hyacinth challenge necessitates a holistic approach that accounts for long-term effects and challenges. Continuous monitoring and management efforts are crucial to prevent reinfestation or recurrences. Research, adequate funding, and collaboration among stakeholders are imperative to develop innovative approaches and technologies. For instance, the utilization of drones for surveillance and mapping of infested areas or the exploration of water hyacinth biomass for sustainable economic purposes hold promise as potential solutions.

Decline of biodiversity and fisheries

With regard to the question on the reasons for decline of biodiversity and fisheries, 53% of the respondents felt pollution is the major cause of decline of species and fisheries, 21% of the respondents found it was over fishing, 16% of the respondents felt it was habitat degradation and 10% felt it was introduction of invasive species.

Pollution

Findings from the study shows that Pollution is the major cause of loss of biodiversity and fisheries with 53% of the respondents agreeing with this idea. Industrial pollution, soil erosion and fertilizer runoff resulted in an alarming increase in the population of surface algae, further exacerbating the lake's ecological balance. As these algae die off, oxygen depletion occur in the deeper layers where fish species reside, amplifying the ecological stress and ultimate decline of fish species and biodiversity.

¹⁸⁰ Sixtus Kayombo* and Sven Erik Jorgensen, "Lake Victoria Experience and Lessons Learned Brief"

Overfishing and unsustainable practices

The findings also reveal that over fishing is the second cause of decline of biodiversity with 21% of the respondents in agreement. The establishment of an expansive fishing industry on Lake Victoria by the British colonial government in the early 1900s initiated a series of unsustainable practices that have had detrimental effects on the lake's biodiversity and fisheries. The introduction of gill nets aimed to enhance the catch of cichlids, but this approach led to rampant overfishing over time. Concurrently, the rapid proliferation of settlements in the surrounding areas and the expansion of agriculture contributed to detrimental consequences.¹⁸¹

Recent research conducted by Tanzania's University of Dar es Salaam has shed light on the concerning escalation of unsustainable exploitation of Lake Victoria's resources. This surge can be attributed to the growing preference for advanced fishing methods utilizing outboard motors and trawlers, which offer enhanced efficiency compared to traditional paddle canoes. As a result, the number of fishermen has surged from around 50,000 in the 1970s to over 200,000 individuals by 2015. This influx of fishermen has been accompanied by a substantial increase in the overall fishing boat count, with the LVFO reporting the introduction of over 2,000 new vessels to the lake each year.¹⁸²

The consequences of overfishing extend far beyond mere population decline and loss of size. They encompass a wide range of ecological implications that significantly impact the delicate balance of the lake's ecosystem. Fish populations suffer a decline not only in their physical attributes but also in their genetic diversity. Consequently, their reproductive success diminishes, rendering them

¹⁸¹ Melanie L.J. Stiassny, "The Biodiversity Crisis: Lake Victoria," accessed May 18, 2023, <https://www.amnh.org/learn-teach/curriculum-collections/biodiversity-crisis/the-biodiversity-crisis-lake-victoria>.

¹⁸² Victor Kiprop, "Concerns over loss of habitat and fish species in Lake Victoria," The East African, May 09, 2018, accessed May 18, 2023, <https://www.theeastafrican.co.ke/tea/science-health/concerns-over-loss-of-habitat-and-fish-species-in-lake-victoria-1393272>.

more vulnerable to diseases and environmental stressors. Moreover, the issue of bycatch looms large, as non-target species and undersized juveniles are inadvertently caught in quantities that surpass what is commercially viable. Unless immediate action is taken, overfishing has the potential to trigger a catastrophic collapse of the target species, thereby initiating a trophic cascade that would unleash devastating consequences throughout the entire ecosystem.¹⁸³

Introduction of Invasive species

Based on the observation of the study, Introduction of invasive species is another major cause of decline of biodiversity and fisheries and this is represented by 10% of respondents who are in support. In 1954, the introduction of the Nile perch delivered a devastating blow to Lake Victoria's delicate ecosystem. The population of Nile perch multiplied at an alarming rate, primarily at the expense of cichlids, their primary prey. By 1978, cichlids accounted for approximately 80% of the lake's biomass, while Nile perch constituted a mere 2%. However, within a decade, the situation drastically reversed, with Nile perch dominating over 80% of the lake's biomass, leaving cichlids with only a fraction of the remaining 20%. Consequently, the current scenario reveals a grim reality where less than 1% of the fish caught in Lake Victoria are cichlids, and more than half of the cichlid species face the looming threat of extinction or have already vanished.¹⁸⁴

Habitat degradation and loss

The study shows that habitat degradation is also a source of decline of biodiversity and fisheries represented by 16% of the respondents. The decline of biodiversity and fisheries is a pressing concern linked to habitat degradation, which arises from a complex interplay of various factors. It encompasses both direct actions that directly impact fish habitats, like the excavation of sand, as

¹⁸³ Lake Victoria Basin Commission, "Aquatic Biodiversity of Lake Victoria" (Nairobi, Kenya: East African Community, 2011), accessed May 18, 2023, <http://repository.eac.int/bitstream/handle/11671/679/AquaticBiodiversityLakeVictoria.pdf?sequence=1&isAllowed=y>.

¹⁸⁴ Ibid.

well as indirect effects that are already evident. For instance, the dense human population in the basin is driving the rapid conversion of forests into agricultural land, leading to increased surface runoff and sediment accumulation in rivers. These changes in habitat conditions manifest as shoreline erosion, suffocation of littoral habitats, blockage of riverbeds, and the accumulation of sediment in wetlands.¹⁸⁵

Another significant threat to fish diversity stems from the reduction in water levels within water bodies, profoundly affecting habitat availability. In the case of Lake Victoria, between late 2000 and 2005, a substantial recession of approximately 5 meters along the coastline occurred. This decline in water levels has resulted in a shrinking of fish habitats in the littoral areas, potentially causing detrimental impacts on fish diversity. Notably, once thriving shallow bays like Kusa and Kendu in Kenya have transformed into desiccated landscapes, while the once flourishing river delta of Nyando Awach has significantly diminished.¹⁸⁶

Among the most notable anthropogenic influences on the biodiversity of Lake Victoria is the regulation of rivers that flow into the lake. This practice exerts both immediate and long-term impacts on the ecosystem. Changes in hydrological patterns, particularly the reduction of spring run-off, give rise to increased shoaling of river deltas and a decline in delta vegetation, including vital elements such as reeds, cat-tails, and bushes. The loss of this vegetation has detrimental consequences for aquatic fauna, affecting migratory and semi-migratory species that depend on these areas as their natural spawning grounds. Furthermore, the diminished spring flows impede

¹⁸⁵ Ibid.

¹⁸⁶ Ibid.

the upstream migration of fish for spawning, ultimately limiting the availability of essential nursery areas crucial for the survival of numerous species.¹⁸⁷

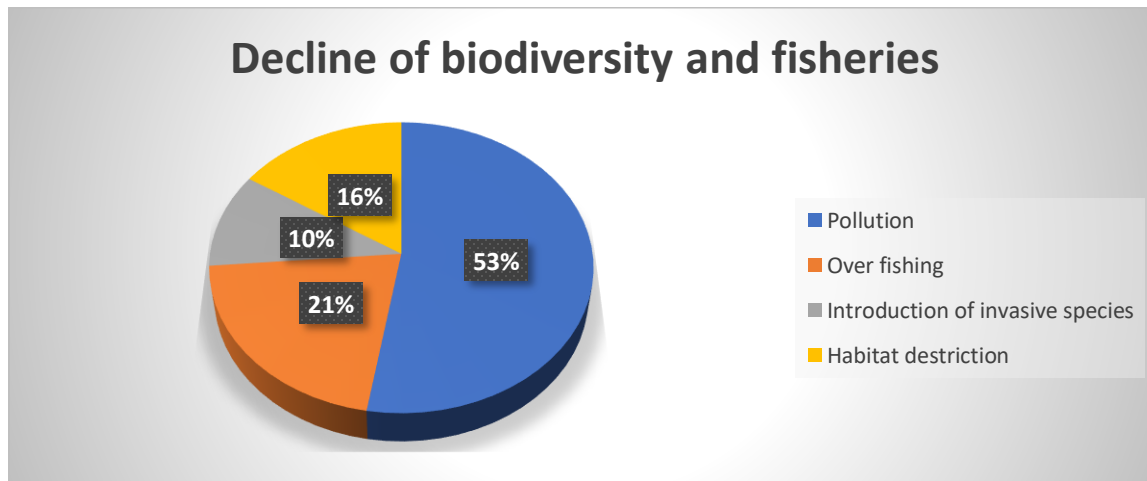


Figure 9. Decline of Biodiversity and fisheries

4.5. How Kenya and Uganda are separately combating the challenges mentioned above and collaborating on matters concerning Lake Victoria.

4.5.1. Kenya Initiatives

Kenya is actively working to confront the difficulties presented by climate change impacts, water quality and pollution, menace of water hyacinth, and decline of biodiversity and fisheries. The country has implemented various strategies and initiatives to effectively tackle these issues.

To combat the impacts of climate change, Kenya enacted the Water Act 2016, which prioritizes sustainable and integrated water resource management. The act recognizes the need to conserve

¹⁸⁷ Ibid

water resources, promote efficient water usage, and protect water sources to mitigate unfavorable impacts of climate change on water accessibility.¹⁸⁸

Ensuring water quality and combating pollution is a top priority for Kenya. The Water Act 2016 incorporates provisions that set standards for water quality, regulate discharges into water bodies, and establish robust mechanisms for monitoring and enforcing water quality regulations. These measures are essential to safeguard water quality and mitigate pollution risks resulting from both climate change and human activities.¹⁸⁹

Although the Water Act 2016 does not explicitly address water hyacinth, its provisions pertaining to water quality and pollution control indirectly contribute to addressing this invasive aquatic plant. By regulating and controlling the release of pollutants into water bodies, the act indirectly helps prevent the proliferation of water hyacinth, preserving the ecological balance of water ecosystems.¹⁹⁰

Kenya acknowledges the significance of protecting water resources and ecosystems to ensure the preservation of biodiversity and fisheries. The Water Act 2016 promotes sustainable water resource management, the conservation of water sources, and the preservation of water quality. These provisions indirectly support efforts to combat the decline of biodiversity and fisheries in Kenya's water bodies.¹⁹¹

In addition to the Water Act 2016, Kenya has established various institutions and initiatives to tackle these challenges. The Kenya Wildlife Service (KWS), serving as the national focal point for the Bonn Convention on Migratory Species and the Ramsar Convention on Wetlands, plays a

¹⁸⁸ Water ACT 2016

¹⁸⁹ Ibid.

¹⁹⁰ Ibid.

¹⁹¹ Ibid.

crucial role in conserving wetlands within designated protected areas such as national parks and game reserves. However, recognizing the fragmented nature of wetland management, the Government of Kenya established the National Wetlands Standing Committee (NWSC) in 1994. This committee collaborates with governmental, academic, NGO, and community-based institutions to define wetlands and develop a comprehensive framework for a national wetlands policy.¹⁹²

To combat invasive aquatic plants, including water hyacinth, Kenya Agricultural Research Institute and the International Centre of Insect Physiology and Ecology (ICIPE) actively conduct research and implement strategies for their management. Cultural and policy approaches, such as quarantine controls, are implemented to curtail the spread of invasive species. The Kenya Plant Health Inspectorate Services (KEPHIS) plays a pivotal role in inspecting imported and exported plant materials, ensuring compliance with regulations.¹⁹³

Through these combined efforts, Kenya is making significant strides in addressing the challenges posed by climate change impacts, water quality and pollution, the menace of water hyacinth, and the decline of biodiversity and fisheries in Lake Victoria. The country is committed to achieving sustainable water resource management and safeguarding its precious ecosystems.

4.5.2. Uganda initiatives

In Uganda, the Ministry of Environment and Natural Resources (MWENR) has identified the degradation of wetlands as a significant environmental concern. This recognition led to the establishment of the National Wetlands Programme (NWP) in 1989, with the primary objective of

¹⁹² Lake Victoria Basin Commission, "Aquatic Biodiversity of Lake Victoria" (Nairobi, Kenya: East African Community, 2011), accessed May 18, 2023, <http://repository.eac.int/bitstream/handle/11671/679/AquaticBiodiversityLakeVictoria.pdf?sequence=1&isAllowed=y>

¹⁹³ Ibid.

developing comprehensive policies and techniques to sustain the ecological and socio-economic values of wetlands for current and future generations. The NWP's efforts align with Uganda's commitment to combat a range of environmental challenges, including the impacts of climate change, water quality and pollution, the challenge posed by water hyacinth, and the decline of biodiversity and fisheries.¹⁹⁴

To effectively address these challenges, Uganda launched the Wetland Sector Strategic Plan (WSSSP) in 2001, outlining a ten-year strategy (2001-2010) to guide wetland management. As part of this plan, the Wetlands Management Department was established, working tirelessly to raise awareness at national, district, and local levels. They have conducted extensive inventories of wetlands, researched their values and functions, and collaborated with communities to develop community-based Wetlands Management Plans. The piloting of this approach in various districts within the Lake Victoria Basin (LVB) has yielded positive results, with 23 management plans developed across the country. Currently, the implementation of ten plans, including those for the Kyojja and Nabugabo wetlands in the LVB, is underway.¹⁹⁵

In addition to these efforts, Uganda has recognized the importance of officially designating and protecting critical wetland areas. The government initiated the gazetting process with the Nakivubo wetland in Kampala, marking the start of safeguarding wetlands of significant importance. This approach ensures that these invaluable ecosystems receive the necessary protection and conservation measures.¹⁹⁶

¹⁹⁴ Ibid.

¹⁹⁵ Ibid.

¹⁹⁶ Ibid.

Within the realm of water quality and pollution, the National Water and Sewerage Corporation (NWSC) plays a vital role. Empowered by the NWSC Statute, the corporation focuses on providing safe and reliable water supply services while adhering to stringent water quality regulations. Through the establishment of guidelines, monitoring processes, and effective treatment methods, the NWSC actively addresses the challenge of maintaining water quality standards and mitigating pollution risks. By doing so, they contribute to the overall efforts to ensure the availability of clean and healthy water resources.¹⁹⁷

While the National Fisheries and Aquaculture Policy specifically targets the decline of biodiversity and fisheries, its principles and strategies indirectly benefit other environmental challenges as well. This policy acknowledges the significance of conserving biodiversity within Uganda's water bodies and places emphasis on protecting endangered fish species, preserving aquatic habitats, and promoting sustainable fishing practices. By implementing measures such as licensing, registration, and enforcement to prevent overfishing and protect breeding grounds, the policy contributes to the long-term viability of fish populations and addresses the decline of biodiversity in the fisheries sector.¹⁹⁸

4.5.3. Effectiveness of initiatives taken by Kenya and Uganda

On the question of the effectiveness of the current management efforts by Kenya and Uganda, 50% of the respondents thought it is minimally effective. 31% of the respondents however felt it was not effective at all. 19% of the respondents felt the current efforts are moderately effective and none of the respondents thought the current efforts is highly effective. Overall, the evidence

¹⁹⁷ Uganda, National Water and Sewerage Corporation Act 1995 (Cap. 317), legislation, 1995, accessed May 18, 2023, FAO, FAOLEX.

¹⁹⁸ Advocacy Coalition for Sustainable Agriculture, Ministry of Agriculture, Animal Industry and Fisheries, Ministry of Water and Environment, National Fisheries & Aquaculture Policy, November 2019, accessed May 18, 2023.

gathered in the study points to effectiveness of actions taken by Kenya and Uganda in combating the existing challenges facing Lake Victoria as minimally effective. This is according to the high number of respondents who are in support of this opinion. Most respondents admit that the current efforts are either not effective at all or minimally effective. They believe that more still needs to be done by both countries.

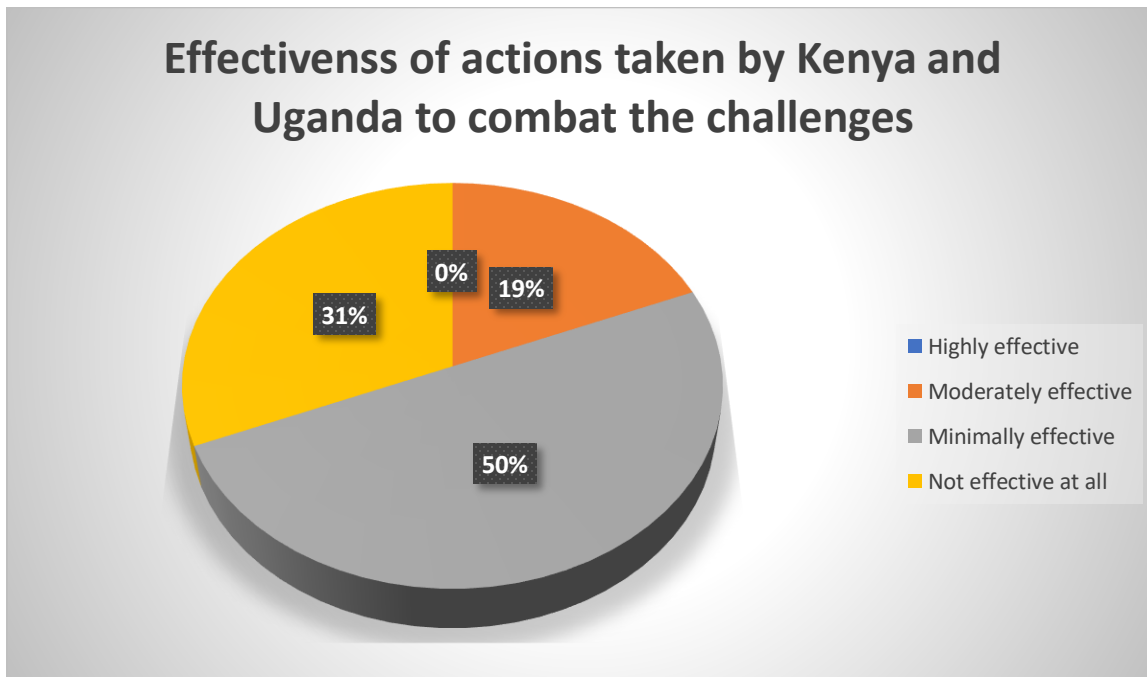


Figure 10. Effectiveness of actions by Kenya and Uganda in combating challenges in L. Victoria

4.5.4. Kenya and Uganda Collaborative Efforts on Challenges facing Lake Victoria.

Diplomatic cooperation

On the question of the current state of diplomatic cooperation between Kenya and Uganda, it was discovered that 50% of respondents believe that Kenya and Uganda have forged good diplomatic cooperation. 25% of the respondents felt the diplomatic cooperation between Kenya and Uganda is fair. However 13% of the respondents thought the diplomatic cooperation between Kenya and Uganda is poor. Only 12 % of the respondents felt there is an excellent diplomatic cooperation

between Kenya and Uganda. These findings revealed that Kenya and Uganda still need to do more on their diplomatic cooperation for them to form a strong partnership to tackle the pressing challenges posed by climate change impacts, water quality and pollution, the proliferation of water hyacinth, and the alarming decline of biodiversity and fisheries in Lake Victoria. Guided by regional agreements and protocols that prioritize sustainable resource utilization, environmental protection, and conservation, these two countries have begun working together to address these critical issues.

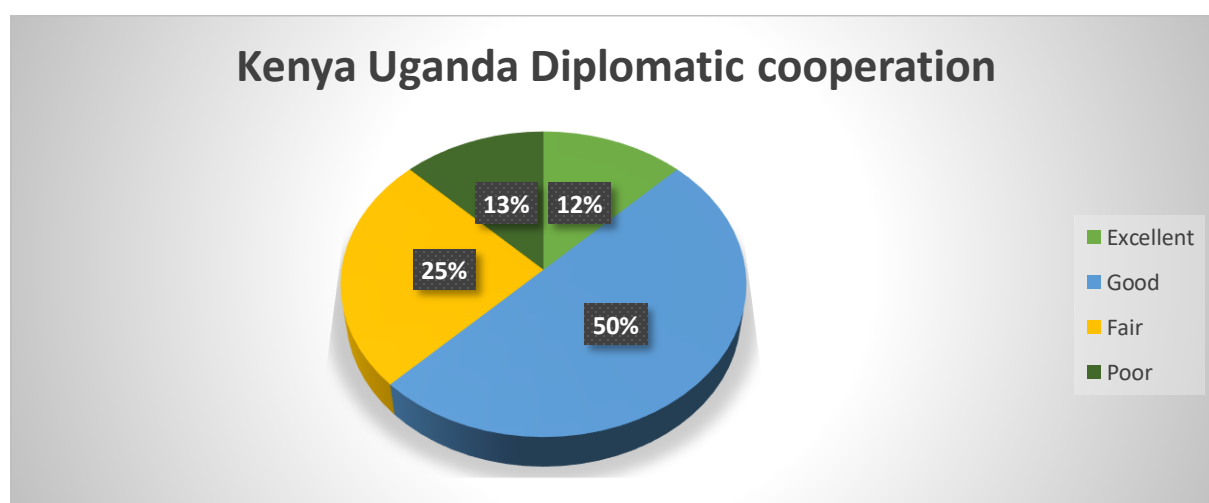


Figure 11. Diplomatic cooperation between Kenya and Uganda

Cooperating jointly within EAC Treaty

The EAC Treaty, which both countries are part of, serves as a foundational agreement. It emphasizes the sustainable utilization of natural resources and the protection of the environment within the region. By adhering to this treaty, Kenya and Uganda commit to taking measures that protect the environment and promote sustainable development.¹⁹⁹

¹⁹⁹ Lake Victoria Basin Commission, "Aquatic Biodiversity of Lake Victoria" (Nairobi, Kenya: East African Community, 2011), accessed May 18, 2023, <http://repository.eac.int/bitstream/handle/11671/679/AquaticBiodiversityLakeVictoria.pdf?sequence=1&isAllowed=y>

Collaboration within LVFO (Effectiveness of LVFO)

On the question of the effectiveness of LVFO, the study's outcome suggest that 43% of the respondents believe that LVFO is highly effective to enable the two countries combat the challenges experienced in the Lake. 31% of the respondents believe that LVFO is moderately effective while 25 % of the respondents believe it is minimally effective. Only 1% of the respondents believe LVFO is not effective at all.

LVFO is a significant agreement signed by both Kenya and Uganda to help in addressing the lake's fisheries resources. This convention plays a vital role in harmonizing measures for the sustainable development and management of the lake's living resources. By collaborating through the LVFO, Kenya and Uganda will work together to ensure responsible utilization of fisheries resources and the implementation of sustainable fishing practices.²⁰⁰

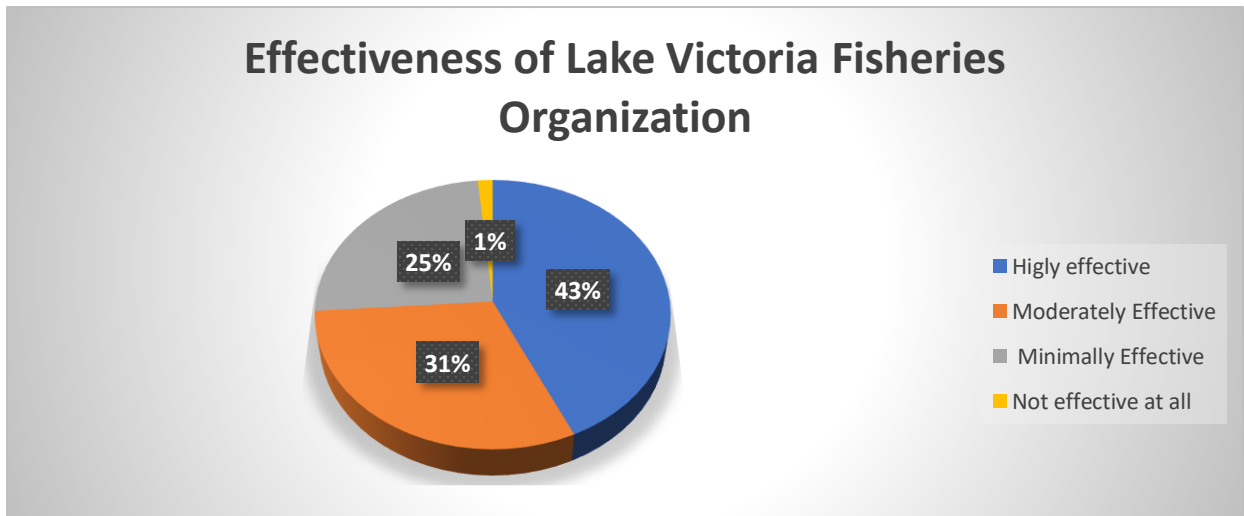


Figure12. Effectiveness of Lake Victoria Fisheries Organization.

²⁰⁰ Ibid.

Collaborating through Protocol for Sustainable development.

Furthermore, the Protocol for Sustainable Development of the Lake Victoria Basin provides a comprehensive framework for addressing the challenges faced by Lake Victoria. This protocol comprises measures for safeguarding and preserving the basin and its ecosystem, promoting sustainable utilization of natural resources, such as fisheries, and preventing pollution. It emphasizes the need for joint efforts to ensure the enduring viability of the lake's resources.²⁰¹ Evidently, the information gathered in the study suggest that the good diplomatic relations enjoyed by Kenya and Uganda is efficient to enable the two countries carry out the joint efforts for viable use of the lake's resources.

Collaboration through Protocol on Environment and Natural Resource Management

The Protocol on Environment and Natural Resources Management establishes a framework for cooperation between Kenya and Uganda in managing the environment and natural resources of Lake Victoria. It covers various aspects, including water resources, biological diversity, wetland resources, forest resources, wildlife, fisheries, and genetic resources. By working together under this protocol, both countries promote coordinated efforts to protect and sustainably manage the lake's ecosystem.²⁰²

Bilateral cooperation through Regional Plan of Action (Effectiveness of Regional Plan of Action)

On the question of effectiveness of bilateral cooperation through Regional Plan of Action in promoting joint efforts between Kenya and Uganda for sustainable management of Lake Victoria resources, 40% of the respondents believed that it is moderately effective. 33% of the respondents felt that it is highly effective while 205 of the respondents thought it is minimally effective. Only 7% of the respondents believed that it is not effective at all. Respondents

²⁰¹ Ibid.

²⁰² Ibid.

suggested that the bilateral cooperation is mostly hindered by self-interest between the two countries. To address the issue of illegal, unreported, and unregulated (IUU) fishing, the Regional Plan of Action to Promote Responsible Fisheries Practices in the Lake Victoria Basin (RPOA-IUU) has been established to enhance bilateral cooperation. This plan aims to prevent, deter, and eliminate IUU fishing practices, conserve fish species, and protect the environment in the lake. Kenya and Uganda collaborate within the framework of RPOA-IUU though not as effectively as findings suggest to combat IUU fishing and ensure the sustainability of fish populations.²⁰³



Figure 13. Bilateral cooperation through Regional Plan of Action.

Collaboration through International legal Instruments

Additionally, global legal agreements and strategies for safeguarding species and habitats play a pivotal role in directing conservation endeavors. Key international conventions, such as the World

²⁰³ Ibid.

Heritage Convention, Ramsar Convention, Convention on Biological Diversity, CITES, Convention on the Conservation of Migratory Species of Wild Animals, along with initiatives like the Code of Conduct for Responsible Fisheries, International Plan of Action on IUU fishing, and International Plan of Action to regulate fishing capacity are among these instruments. These agreements provide guidelines, standards, and protection measures for biodiversity conservation, species trade, and responsible fisheries practices.²⁰⁴

Through their unwavering commitment to these regional agreements, protocols, and international instruments, Kenya and Uganda are making significant progress in addressing the challenges facing Lake Victoria. Their collaborative approach promotes effective resource management, safeguards the environment, and ensures the long-term viability of Lake Victoria's diverse ecosystem. By preserving the lake's natural resources, they are also securing the well-being and prosperity of the communities that rely on its ecological balance.

4.6. Conclusion

This chapter through surveys and interviews conducted has provided an overview of the challenges faced in the transboundary natural resource management of Lake Victoria between Kenya and Uganda. These challenges encompass ecological thematic areas such as the impacts of climate change, water quality and pollution, the persistent threat of water hyacinth, and the decline of biodiversity and fisheries.

The chapter discussed the specific effects of climate change on the lake, including altered weather patterns, temperature changes, and the implications for water availability. It also highlighted the

²⁰⁴ Ibid.

sources of water pollution and the resulting eutrophication, emphasizing the impact on aquatic life and human health. Furthermore, the challenge posed by water hyacinth and its ecological and economic impacts were explored, as well as the decline of biodiversity and fisheries due to overfishing and habitat degradation.

Addressing these challenges is of utmost importance for the sustainable management and conservation of Lake Victoria. The lake serves as a vital resource for the communities living around its shores, providing livelihoods, food security, and economic opportunities. Furthermore, Lake Victoria's ecological significance extends beyond national boundaries, making the collaboration between Kenya and Uganda crucial in ensuring the long-term viability of its resources.

The subsequent chapter, will delve into summary, recommendations and conclusion relevant to this study. By working together, Kenya and Uganda can pave the way for a brighter future for Lake Victoria, where its ecological integrity is preserved, its resources are sustainably utilized, and the well-being of its communities is ensured.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

4.7. Introduction

This chapter will look into the research findings while paying attention to the three main objectives of the study. The chapter will also draw conclusions based on the results obtained from surveys conducted on the research. At the tail end of this chapter we will provide recommendations that address the identified gaps and challenges encountered in transboundary natural resource management on diplomatic cooperation among the East African Community States, with a specific focus on Lake Victoria between Kenya and Uganda.

4.8. Summary of findings

This study sought to identify and discuss transboundary natural resource management diplomatic cooperation among the East African Community States, with a specific focus on Lake Victoria between Kenya and Uganda. The first objective of the study was to assess transboundary natural resource management on diplomatic cooperation among the East Africa Community states. It emerged that effective governance of TBNR can foster good diplomatic cooperation and peaceful coexistence between states. The findings also revealed that good transboundary resource governance strategies can alleviate accrued animosity rising from such shared resources, enhance sustainable use of the resources and promote their equitable use. The case studies presented of Great Lakes Water Resources, the Cubango-Okavango River Basin, and the Nile River Basin

revealed how TBNR can be successfully managed to achieve desired diplomatic goals through collaborations, trust building and effective communications among countries.

The study also determine and analyze the role played by TBNR of Lake Victoria in promoting diplomatic cooperation between Kenya and Uganda. The findings of the study revealed that Transboundary Natural Resources Management (TBNRM) of Lake Victoria has played a critical role in promoting cooperation, resolving conflicts and enhancing diplomatic relations between Kenya and Uganda. The investigation evidently demonstrated that sustainable use and management of Lake Victoria resources have been made possible through the joint efforts of both countries under the umbrella of regional organizations and treaties such as the EAC, NBI, LVBC, LVFO and LVFRP. The findings also reveal that effective management of shared natural resources such as Lake Victoria is crucial in promoting regional cooperation, and the TBNRM approach provides a practical framework for achieving this.

Transboundary natural resource management has not been without its challenges. For this reason, the study sought to investigate key challenges experienced in TBNR of Lake Victoria management between Kenya and Uganda as its last objective. It was discovered that challenges faced in TBNR of Lake Victoria encompass ecological challenges like impacts of climate change, water quality and pollution, the persistent threat of water hyacinth, and the decline of biodiversity and fisheries.

The evidence gathered show specific effects of climate change on the lake, including altered weather patterns, temperature changes, and the implications for water availability. It also highlighted the sources of water pollution and the resulting eutrophication, emphasizing the impact on aquatic life and human health. The findings also revealed that there still exist the challenge posed by water hyacinth and its ecological and economic impacts were explored. Similarly, the

study identified the decline of biodiversity and fisheries due to overfishing and habitat degradation as another problem facing Lake Victoria.

The research reveals that Kenya and Uganda have put up both individual and collective measures to effectively combat these challenges and ultimately improve their diplomatic cooperation. Some of the efforts put by the two countries are effective however others are not as effective because of the intentional self-interest at play.

4.9. Conclusion

Based on the findings of this study it is true that management of Lake Victoria still affected by a number of challenges. The main challenges are pollution, overfishing, introduction of invasive species, soil erosion and habitat degradation. The findings also reveal that pollution is the major challenge affecting the lake. That pollution of the lake is three fold, industrial pollution, domestic pollution and agricultural pollution. From the findings, industrial pollution deposits Mercury, lead, cadmium, and organic compounds into Lake Victoria. Agricultural pollution deposits Nitrates, phosphates, pesticides, and herbicides into the lake. While domestic pollution deposits Nutrients, chemicals, organic matter into the lake. Moreover the findings attribute loss of biodiversity in the lake to pollution.

Kenya and Uganda have not taken much action at individual state level to combat the challenges affecting Lake Victoria. It has emerged that self interest in the reason behind this non commitment. As a result the Lake continues to choke in harmful but preventable challenges because nobody wants to adhere to the set standards and regulations.

Diplomatic cooperation between Kenya and Uganda is good enough to enable both countries fight against the challenges witnessed in the lake. This is evident from a number of collaborations underway to save the lake and its resources. However bilateral collaborations to help save the lake is still moderate between Kenya and Uganda.

Finally the findings show that Lake Victoria Fisheries Organization is resolute in its mandate to save the lake and its resources.

4.10. Recommendations

Following the analyses and study findings of this study, it is recommended that both Kenya and Uganda should strengthen their collaboration in the management of Lake Victoria and its resources. More avenues that encompass joint exercises need to be explored in order to sustainably use the lake.

Moreover, management efforts need to be improved to maintain their effectiveness. Both Kenya and Uganda can do this by implementing additional measures, enhancing monitoring and enforcement, and promoting stakeholder engagement.

Both Kenya and Uganda need to find ways of mitigating self-interest if they want to effectively manage Lake Victoria. They could apply strategies like promoting transparency, establishing clear regulations and guidelines, and encouraging inclusive decision-making processes.

Finally Both Kenya and Uganda need to continue applying diplomatic mechanisms and strategies in the management of TBNR of Lake Victoria. Both countries should maintain diplomatic channels such as increased dialogue, joint planning, and the establishment of frameworks for cooperation.

REFERENCE

- Advocacy Coalition for Sustainable Agriculture, Ministry of Agriculture, Animal Industry and Fisheries, Ministry of Water and Environment, National Fisheries & Aquaculture Policy, November 2019, accessed May 18, 2023.
- Albright T. et al., "The Abundance and Distribution of Water Hyacinth in Lake Victoria and the Kagera River Basin, 1989-2001," (Sioux Falls, SD: U.S. Geological Survey/EROS Data Center, Raytheon, Clean Lakes, Inc., Nile International Conference Centre, Kampala, Uganda, March 2007).
- Aloo, P. A., & Othoro, W. K. "Impacts of climate change on Lake Victoria and its water resources: A review." *Journal of Environmental Treatment Techniques* 7, no. 3 (2019): 369-375.
- Ashirwadani J., "Communication Research Methods: Methods of Data Analysis." 2008.
- Awange, Joseph L., and Obiero Ong'ang'a. *Lake Victoria: Ecology, Resources, Environment*. Springer-Verlag Berlin Heidelberg, 2006.
- Balirwa J.S. et al., "The Management of Fisheries and Aquaculture in Uganda," in *Lake Victoria Fisheries Resources Research Institute, Annual Report for the year 2000*, 15-16.
- Bradley C. Karkkainen, "The Great Lakes Water Resources Compact and Agreement: A Model for Transboundary Governance at Subnational Scales?" *Sea Grant Law & Policy Journal* 9, no. 3 (2016): 1-22.
- Burke R. Johnson, Antony J. Onwuegbuzie, Lisa A. Turner, "Towards a Definition of Mixed Methods Research," *Journal of Mixed Methods Research*, 2007.
- Charles C. Anukwonke, "The Concept of Tragedy of the Commons: Issues and Applications," *ResearchGate* (2015): 2-3.
- Convention on the Law of the Non-Navigational Uses of International Watercourses, May 21, 1997, 36 I.L.M. 700.
- Creswell and Plano Clark, "Designing and Conducting Mixed Methods Research," cited in Lelisa TB, "Research Methodology," PhD Thesis, University of South Africa, 2018.
- De Vaus, D.A. *Research Design in Social Research*. London: SAGE Publications, 2001.
- Fleming J. and Zegwaar K., "Methodologies, methods and ethical considerations for conducting research in work-integrated learning." 2018.
- Dhliwayo, M., "Legal Aspects Of Trans-Boundary Natural Resources Management In Southern Africa," (paper prepared for the IASCP conference, 2002, Harare, Zimbabwe).

- East African Community Lake Victoria Basin Commission, "Regional Transboundary Diagnostic Analysis of the Lake Victoria Basin" (March 2007)
- Gandiwa, E., Muboko, N., & Zisadza, P. The Kavango-Zambezi Transfrontier Conservation Area: Opportunities and challenges. *Parks*, (2019) 25(2), 9-18.
- Gleick, P. H. "Transboundary water management. In *Encyclopedia of the Anthropocene*". (2019): 485-490. Elsevier.
- Gleick, P. H. "Water, Drought, Climate Change, and Conflict in Syria," *Weather, Climate, and Society* 6, no. 3 (2014): 331-340, doi: 10.1175/WCAS-D-13-00059.1.
- Griffin C., Kajutti M., Mansourian M., and Swallow M., *Transboundary Natural Resources: The Intersection of International Law and International Relations* (Cambridge University Press, 1999).
- Hamed Taherdoost. 2016. "Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research," *International Journal of Academic Research in Management*. Vol. 5, No.2.
- H. Van der Linde, J. Oglethorpe, T. Sand with, D. Snelson, and Y. Tessema (with contributions from Anada Tiega and Thomas Price), "Beyond Boundaries: Transboundary Natural Resource Management in Sub-Saharan Africa," (D.C., U.S.A.: Biodiversity Support Program, 2001), 2.
- IUCN and UNDP. 2008. *Transboundary Natural Resource Management in East Africa: The Case of Lake Victoria*. Nairobi: IUCN Eastern Africa and UNDP
- John E. Carroll (ed.), "International Environmental Diplomacy". New York: Press Syndicate of the University Of Cambridge, 1992.
- Kabagambe, Edward K. 2011. "Transboundary Resource Management and Conflict Resolution in East Africa: The Case of Lake Victoria." *African Journal on Conflict Resolution* 11 (1): 55-73.
- Kaua C.G, "Transboundary natural resource management: Rationale, challenges and way forward," *International Journal of Environmental Protection and Policy* 2, no. 6 (2014): 174-182.
- Mandivamba Dhliwayo, "Legal Aspects of Trans-Boundary Natural Resources Management in Southern Africa" (paper presented at the IASCP Conference, 2002).
- Maxwell, J. A. *Qualitative Research Design: An Interactive Approach* London, Applied Social Research Method Series. (1996)
- Mayda J., "Definition of internationally shared Natural Resources," *United Nations Environment Programme* (1978): 7.

- Munyaho, T., Muhoozi, L., & Ayebare, F. "Transboundary natural resource management in East Africa: The case of Lake Victoria." *International Journal of Development and Sustainability* 5, no. 11 (2016): 357-370.
- Okonkwo Theodore, "Management of Transboundary Natural Resources., 2017. " *Journal of Law and Conflict Resolution* 9, no. 4 (2017): 43-44, doi: 10.5897/JLCR2017.0772.
- Onen D., (Ph.D.). "Study Population and Sampling." College of Education and External Studies, Makerere University. (2020).
- Osuala, E. C. \. Introduction to research methodology (3rd ed.). (Onitsha: African – First Publishers Ltd., 2007.)
- Onyango, P. O., Ochiewo, J., & Kairu, A. "Impacts of human activities on the water quality of Lake Victoria: A review." *International Journal of Scientific Research and Management* 6, no. 5 (2018): 582-593.
- Ostrom, Elinor. *Governing the commons: The evolution of institutions for collective action.* Cambridge University Press, 1990.
- Othieno, Lillian, et al. "Transboundary natural resource management: The case of Lake Victoria." *International Journal of Sustainable Development & World Ecology* 24, no. 1 (2017): 60-73.
- Richard K. Paisley, and Taylor W. Henshaw, "Transboundary governance of the Nile River Basin: Past, present and future," International Waters Governance Initiative, University of British Columbia
- R. Burke Johnson, Antony J. Onwuegbuzie, Lisa A. Turner, "Towards a Definition of Mixed Methods Research," *Journal of Mixed Methods Research*, 2007.
- SADC. "SADC Protocol on Shared Watercourses." Southern African Development Community, 2000.
- Sam Goundar. "Chapter 3- Research Methodology and Research Method." (2019)
- Salkind, N. J. T.). *Exploring research.*(Upper Saddle River, NJ: Prentice Hall, 2010).
- Scheumann W. and Neubert S., *Transboundary Water Management in Africa: Challenges for Development Cooperation; Study for the Research and Consultancy Project "Cooperation on Africa's Transboundary Water Resources" on behalf of the Ministry for Economic Cooperation and Development (BMZ) (Bonn: German Development Institute, 2006).*
- Schulte P., "The Great Lakes Water Agreements," *Water Brief* 2 (2019): 1-5.

- Sekaran, U.. Research methods for business: A skill building approach. 4 ed., (New Jersey:John Wiley and sons)
- Smith, J. (2018). Challenges in managing transboundary natural resources: a case study of Lake Victoria. *International Journal of Environmental Studies*, 75(6), 923-937. doi: 10.1080/00207233.2018.1479656
- S.Y. Phoon, A.Y. Shamseldin, and K. Vairavamoorthy, "Assessing impacts of climate change on Lake Victoria Basin, Africa," in Proceedings of the 30th WEDC International Conference, Vientiane, Lao PDR, 2004, PEOPLE-CENTRED APPROACHES TO WATER AND ENVIRONMENTAL SANITATION.
- Uganda, National Water and Sewerage Corporation Act 1995 (Cap. 317), legislation, 1995, accessed May 18, 2023, FAO, FAOLEX.
- United Nations Economic Commission for Europe, "Policy Guidance Note on the Benefits of Transboundary Water Cooperation: Identification, Assessment and Communication" (New York and Geneva: United Nations, 2015)
- United Nations General Assembly, "Transforming our world: the 2030 Agenda for Sustainable Development," A/RES/70/1 (Oct. 21, 2015).
- UNECA. "Transboundary Natural Resources Management in Africa: Challenges, Prospects and Emerging Issues." African Development Forum Briefing Paper Series, no. 7, 2010.
- Zewdineh B. Haile and Ian L.G. Wadley, "Common Goods and the Common Good: Transboundary Natural Resources, Principled Cooperation, and the Nile Basin Initiative," *Natural Resources Journal* 50, no. 2 (2010).

Internet Sources

- African Union, "African Network of Basin Organizations (ANBO)," accessed April 9, 2023, <https://au.int/en/organs/anbo>.
- African Union, "African Convention on the Conservation of Nature and Natural Resources," accessed April 9, 2023, <https://au.int/en/treaties/african-convention-conservation-nature-and-natural-resources>.
- African Union. African Charter on Human and Peoples' Rights.1981. Retrieved from <https://au.int/en/treaties/african-charter-human-and-peoples-rights>
- African Union. Agenda 2063: The Africa We Want. 2015. Retrieved from <https://au.int/agenda2063>

Barbara Nakangu Bugembe, "Natural Resource Governance Framework Challenges and Opportunities in Eastern and Southern Africa," (REGIONAL SCOPING REPORT, International Union for Conservation of Nature Commission on Environmental, Economic and Social Policy, November 2016), <https://portals.iucn.org/library/sites/library/files/documents/2016-063.pdf>.

CBD. (n.d.). Convention on Biological Diversity. Retrieved from <https://www.cbd.int/convention/>

COMESA. COMESA Strategy for Transboundary Natural Resources Management. 2015. Retrieved from <https://www.comesa.int/wp-content/uploads/2019/08/Transboundary-Natural-Resources-Management-Strategy.pdf>

Cooperative Framework Agreement, Nile Basin Initiative, accessed May 2, 2023, <https://www.nilebasin.org/index.php/81-nbi/73-cooperative-framework-agreement>

East African Community, "About EAC," East African Community, accessed May 11, 2023, <https://www.eac.int/about-eac>.

East African Community. Lake Victoria Basin Commission. 2008. Retrieved from <https://www.eac.int/lake-victoria-basin-commission>

East African Community, "The East African Community Treaty," accessed April 19, 2023, <https://www.eac.int/treaty/>.

"Environmental Policy Brief for The Lake Victoria Basin," (2007), accessed on April 16, 2023, <http://lvbc-ea.org/wp-content/uploads/2015/03/LVBC-Enviro-Policy-Brief-2007.pdf>

Evans A.K. Miriti, "Lake Victoria," African Great Lakes Information Platform, accessed on April 16, 2023, <https://agl.iisd.org/lake-victoria/>

Kiprop V., "Concerns over loss of habitat and fish species in Lake Victoria," The East African, May 09, 2018, accessed May 18, 2023, <https://www.theeastafrican.co.ke/tea/science-health/concerns-over-loss-of-habitat-and-fish-species-in-lake-victoria-1393272>.

Lake Victoria Basin Commission, "Aquatic Biodiversity of Lake Victoria" (Nairobi, Kenya: East African Community, 2011), accessed May 18, 2023, <http://repository.eac.int/bitstream/handle/11671/679/AquaticBiodiversityLakeVictoria.pdf?sequence=1&isAllowed=y>.

Lake Victoria Basin Commission, "Protocol for the Sustainable Development of Lake Victoria Basin," accessed April 19, 2023, <https://lvbc.int/protocol-for-the-sustainable-development-of-lake-victoria-basin/>

Lake Victoria Basin Commission and the Lake Victoria Basin Resource Management Strategy Coordination Unit, "Legal Frameworks," International Waters Learning Exchange and

Resource Network, accessed May 9, 2023, <https://iwlearn.net/documents/legal-frameworks/lake-victoria-basin-commission-and-the-lake>.

Lake Victoria Basin Commission (LVBC), "About LVBC," accessed May 2, 2023, <https://lvbc.securehostdns.com/about-lvbc/>.

Lake Victoria Fisheries Organization, "About LVFO," accessed April 19, 2023, <https://www.lvfo.org/about-lvfo/>.

Mekong River Commission (MRC). Overview of the MRC. (2021). Retrieved from <https://www.mrcmekong.org/about-the-mrc/overview-of-the-mrc/>

Melanie L.J. Stiassny, "The Biodiversity Crisis: Lake Victoria," accessed May 18, 2023, <https://www.amnh.org/learn-teach/curriculum-collections/biodiversity-crisis/the-biodiversity-crisis-lake-victoria>.

Nassali J. et al., "A Systematic Review of Threats to the Sustainable Utilization of Transboundary Fresh Water Lakes: A Case Study of Lake Victoria," International Journal of Scientific and Research Publications 10, no. 2 (February 2020): 657, accessed May 18, 2023, <http://dx.doi.org/10.29322/IJSRP.10.02.2020.p9890>.

Ndirangu, J. G. "Border Diplomacy and Territorial Disputes in the IGAD Region: A Case Study of Kenya." PhD thesis, Strathmore University, 2020. <http://hdl.handle.net/11071/12080>.

Okoth P. Godfrey, "Intermittent Tensions in Uganda-Relations: Historical Perspectives," Transafrican Journal of History 21 (1992): 69-92, accessed May 10, 2023, <https://www.jstor.org/stable/24520421>.

Okungu, J.O., S. Njoka, J.O.Z. Abuodha, and R.E. Hecky. Lake Victoria Environment Management Project (LVEMP). Accessed May 8, 2023. <http://hdl.handle.net/1834/7140>.

Okidi C.O, "Legal and Institutional Aspects of Management of the Environment in Lake Victoria Basin," in United Nations Environment Programme (UNEP), Pan African START Secretariat (PASS), accessed May 9, 2023, <http://hdl.handle.net/1834/7370>.

Olivia O. Green, Barbara A. Cosens, and Ahjond S. Garmestani, "Resilience in Transboundary Water Governance: the Okavango River Basin," Ecology and Society 18, no. 2 (2013): n.p., accessed May 2, 2023, <https://www.jstor.org/stable/26269304>.

Omari Mwinjaka, "Lake Victoria Basin Water Resources Information Systems," presentation at the East Africa Community Lake Victoria Basin Commission Workshop on Mid-to Long-Term Water Resources Management and Planning in East Africa, accessed on April 16, 2023, <http://lvbc-ea.org/workshop-on-mid-to-long-term-water-resources-management-and-planning-in-east-africa/>.

Permanent Okavango River Basin Water Commission (OKACOM), Realising the Benefits of Transboundary Water Cooperation in the Cubango-Okavango River Basin (United Nations Economic Commission for Europe (UNECE), June 2020),

https://unece.org/fileadmin/DAM/env/water/activities/Benefits_cooperation/OKACOM_Policy_Document_June_2020.pdf

The World Bank, Report No: 148631 - AFR, 'Towards Climate Resilient Environmental and Natural Resources Management in the Lake Victoria Basin' (Washington DC: The World Bank, June 2020), accessed May 18, 2023, <http://www.worldbank.org>.

Uganda Electricity Generation Company Limited, "Owen Falls Dam," accessed May 8, 2023, <https://www.uegcl.com/owen-falls-dam/>.

United Nations Conference on Trade and Development, "Uganda: Enhancing Export Competitiveness through Trade Facilitation Reform," accessed May 8, 2023, https://unctad.org/system/files/official-document/ditccipc2018d3_en.pdf.

United Nations Department of Economic and Social Affairs, Sustainable Development, accessed May 1, 2023, <https://sustainabledevelopment.un.org/>.

United Nations Environment Programme. Convention on Biological Diversity. 1992. Retrieved from <https://www.cbd.int/convention/>

UN Environment Programme (UNEP). Water diplomacy: Making water cooperation happen. (2018). Retrieved from <https://www.unep.org/resources/report/water-diplomacy-making-water-cooperation-happen>

United Nations. Sustainable Development Goals. (2015). Retrieved from <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

Wanyonyi P., "Kenya Launches New Oil Jetty in Kisumu," The East African, May 2, 2019, <https://www.theeastafrican.co.ke/tea/business/kenya-launches-new-oil-jetty-in-kisumu-1415860>

"What is the Tragedy of the Commons?" (2019). Economy. Retrieved from <https://www.ecnmy.org/learn/your-economics/economic-glossary/what-is-the-tragedy-of-the-commons/>

Were, Edmond M. "Conflict of Interest in Exploitation and Utilization of Transboundary Natural Resources on Lake Victoria." Journal of African and Conflict Peace Studies 3, no. 1 (2016): 6. <http://dx.doi.org/0.5038/2325-484x.3.1.1078>

WWF, "Transboundary River Basins: Status and Trends," accessed May 10, 2023, <https://wwf.panda.org/?uNewsID=102376>

APPENDICES

APPENDIX I: QUESTIONNAIRE 1.

Greetings!

I am Edwine Otieno Ayoma, a Master of Arts in Diplomacy student at the esteemed University of Nairobi. As part of my program requirements, I am conducting a study that explores transboundary natural resource management on diplomatic cooperation among the East African Community States, with a specific focus on Lake Victoria between Kenya and Uganda.

The main objective of this study is to identify transboundary natural resource management on diplomatic relations between these two countries and provide recommendations for appropriate initiatives. Rest assured that all the information gathered will be used solely for academic purposes and will be made available to the public through the publication of a project for dissemination of findings.

Your participation in this questionnaire will be highly appreciated, and your responses will be treated with the utmost confidentiality. Thank you for your time and valuable input!

PART A: DEMOGRAPHIC DATA

1. What gender do you identify as? 1. Male [] 2. Female []
2. What is your age in years?
18-24 years [] 25-34 years [] 35-44 years [] 45-54 years [] 55-64 years []
3. What is your highest level of education?
Secondary [] College/certificate [] University []
4. What is your current rank?.....

PART B: CHALLENGES EXPERIENCED IN TBNR OF LAKE VICTORIA BETWEEN KENYA AND UGANDA.

1. What are the major challenges faced in the transboundary resource of Lake Victoria between Kenya and Uganda?.....
.....
.....
2. In your opinion, what additional measures or strategies should be implemented to overcome the challenges in the TBNRM of Lake

Victoria?.....
.....
.....

3. How would you rate the overall effectiveness of the current management efforts in addressing the challenges in the TBNRM of Lake Victoria?

Highly effective [] Moderately effective [] Minimally effective [] Not effective at all []

4. What do you think are the main sources of pollution in Lake Victoria? Industrial activities [] Agricultural practices [] Domestic waste [] Atmospheric deposition [] Other []

5. What do you think are the main reasons for the decline of biodiversity and fisheries in Lake Victoria? Overfishing [] Introduction of invasive species [] Habitat degradation [] Pollution [] Other []

6. From your perspective, how effective is Lake Victoria Fisheries Organization in coordinating and implementing TBNRM efforts more so in management of fisheries in Lake Victoria?

Highly effective [] Moderately effective [] Minimally effective [] Not effective at all []

END

APPENDIX II: QUESTIONNAIRE 2

Greetings!

I am Edwine Otieno Ayoma, a Master of Arts in Diplomacy student at the esteemed University of Nairobi. As part of my program requirements, I am conducting a study that explores transboundary natural resource management on diplomatic cooperation among the East African Community States, with a specific focus on Lake Victoria between Kenya and Uganda.

The main objective of this study transboundary natural resource management on diplomatic relations between these two countries and provide recommendations for appropriate initiatives. Rest assured that all the information gathered will be used solely for academic purposes and will be made available to the public through the publication of a project for dissemination of findings.

Your participation in this questionnaire will be highly appreciated, and your responses will be treated with the utmost confidentiality. Thank you for your time and valuable input!

PART A: DEMOGRAPHIC DATA

5. What gender do you identify as? 1. Male 2. Female
6. What is your age in years?
18-24 years 25-34 years 35-44 years 45-54 years 55-64 years
7. What is your highest level of education?
Secondary College/certificate University
8. What is your current rank?.....

PART B: TBNRM OF LAKE VICTORIA AND DIPLOMATIC COOPERATION BETWEEN KENYA AND UGANDA

1. How would you describe the current state of diplomatic relations between Kenya and Uganda regarding the management of Lake Victoria's resources?
Excellent Good Fair Poor
2. What measures do you think could enhance the diplomatic cooperation between Kenya and Uganda in addressing the challenges of TBNRM in Lake Victoria?.....
.....
.....

3. How effective have bilateral or multilateral agreements through Regional Plan of Action been in promoting joint efforts between Kenya and Uganda for the sustainable management of Lake Victoria's resources?

Highly effective [] Moderately effective [] Minimally effective [] Not effective at all []

4. To what extent do you think self-interest among stakeholders has influenced the TBNRM efforts in Lake

Victoria?.....
.....
.....

END

APPENDIX III: Key Informant Interview Guide.

1. What specific challenges have you observed or experienced in the transboundary natural resource management of Lake Victoria between Kenya and Uganda?
2. How do these challenges impact the diplomatic cooperation between Kenya and Uganda regarding the management of Lake Victoria's resources?
3. Can you provide examples of any successful initiatives or strategies that have been implemented to overcome the challenges in transboundary natural resource management of Lake Victoria between Kenya and Uganda?
4. From your perspective, what are the potential areas of improvement to enhance both the transboundary natural resource management efforts and diplomatic cooperation between Kenya and Uganda in relation to Lake Victoria?

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