AGRARIAN EVOLUTION ON WETLANDS IN KAMPALA DISTRICT

1900-2010

BY

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A DISSERTATION SUBMITTED TO THE DIRECTORATEOF RESEARCH AND GRADUATETRAINING IN PARTIALFULFILLMENTOF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE MASTERS OF ARTS IN HISTORY OF KYAMBOGO UNIVERSITY

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DECLARATION

I, **MUBENE ERIYA,** hereby declare that this dissertation titled "**Agrarian evolution on wetlands in Kampala district; 1900-2010"** is my original work as a result of my personal effort and has never been submitted to any university or any other institution of higher learning for any kind of award, except where due acknowledgement is made.

Signature…….....Date…….

MUBENE ERIYA

APPROVAL

This research dissertation has been approved for submission as partial fulfilment for the award of a Masters' Degree of arts in history of Kyambogo University with our approval.

I certify that Mubene Eriya has done this work under our guidance and supervision.

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DR.JUMA SULTAN KAKUBA

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LIST OF ABBREVIATIONS/ACCRONYMS

AD:	Anno Domini
Assoc:	Associate
BC:	Before Christ
CEC:	Cation Exchange Capacity
HCM:	Health Co-ordinating Committee
IITA:	International Institute of Tropical Agriculture
KCCA:	Kampala Capital City Authority
Kg:	Kilogram
Km:	Kilometre
LC:	Local Council
MAAIF:	Ministry of Agriculture, Animal Industry and Fisheries
NEMA:	National Environment Management Authority
NES:	National Environment Statute
NGO:	Non-Government Organisation
NPK:	Nutrients of Nitrogen, Phosphorous and Potassium
NRA:	Natural Reserve Authority
NWP:	National Wetland Programme

PH:	Potential Hydrogen
PMA:	Plan for Modernisation of Agriculture
Sm:	Square mile
ULC:	Uganda Land Commission
UPA:	Urban and Peri-urban Agriculture

DEFINITION OF KEY TERMS

Wetland refers to a place where the land is covered by water either salt, fresh or somewhere in between marshes and ponds, the edge of the lake or ocean, the delta at the mouth of the river, low lying areas that frequently flood are all wetlands.

Genesis means the origin or coming into being of something or the process or mode of origin.

Evolution means gradual development of something**.**

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Natural reserve is a protected area of importance for flora, fauna, funga, or features of geological or other special interest, which is reserved and managed for purposes of conservation and to provide special opportunities for study or research.

Agrarian means relating to the ownership and use of land, especially farmland, or relating to the part of a society or economy that is concerned with agriculture.

Colonial government is a practice or policy of control by one nation over the people living in different areas or countries, often by establishing colonies and generally with the aim of economic dominance.

Degradation is the process of something becoming worse or weaker, or being made worse or weaker.

Agro based industries are industries concerned with the production and processing of agricultural products.

Ecosystem refers to all the living things (plants, animals and organisms) in a given area, interacting with each other, and with their non-living environments (weather, earth, sun, soil, climate, atmosphere).

Government Policy refers to a set of principles, guidelines, or rules established by a government to guide decision-making and action on specific issues.

Encroachment refers to movement into or in-ward entry to another's property without right or permission.

Topography is the study and description of the physical features of an area, for example its hills, valleys, or rivers.

Climate is the average weather in a given area over a longer period of time.

Temperature is the degree or intensity of heat present in a substance or object, especially as expressed according to a comparative scale and shown by a thermometer or perceived by touch.

Taboo refers to a social or religious custom prohibiting or restricting a particular practice or forbidding association with a particular person, place, or thing.

Customary law refers to the established pattern of behaviour that can be objectively verified within a particular social setting.

Eviction is the action of expelling someone from a property.

Poverty is the state of being inferior in quality or insufficient in amount.

Industrialisation is the process of transforming the economy of a nation or region from a focus on agriculture to a reliance on manufacturing.

Crown land is the land belonging to the crown and yielding revenues that the reigning sovereigns are entitled to public land in some British dominions or colonies.

Mailo land is a square mile, hence the derivation of mailo, which is also equivalent to 640 acres. The term is used in Uganda to describe a land tenure system that came into effect when the kingdom of Buganda signed an agreement with the British-administered Uganda Protectorate there in 1900.

ABSTRACT

The study discusses the Agrarian evolution on wetlands of in Kampala District from 1900-2010.This is done by looking forward to examining the genesis of agrarian evolution on wetlands of Kinawataka, Luzira and Lubigi in Kampala, discussing the reasons for rapid transition of wetlands into agrarian spaces in Kampala as well as analysing the impact of agrarian evolution on wetlands in Kampala. To achieve these objectives, the research deployed a qualitative approach of data collection and analysis where data was collected using oral interviews from residents of Kinawataka, Luzira and Lubigi as well as key informants. Documentary review and observation were also used. Findings reveal that before colonialism, there was less encroachment on wetlands but events went on evolving from 1900 onwards as the colonialists took over uplands for administration and urbanisation pushing nationals around Kampala to wetlands for cultivation. In the immediate post-colonial Kampala (1960s to 1990), wetlands were not threatened by agrarian practices as much as they became in the late 1980s, through the 1990s and the 21st century. Findings point to dynamics of urbanisation, political violence, increased population and reluctance of the legal regime have facilitated the escalation of agrarian practices in Kinawataka, Luzira and Lubigi wetlands. Findings further show that as population in Kampala City grows, there is a number of people who have turned wetlands into urban farms as an alternative source of food, income and general livelihood because they are incapacitated to buy food on daily basis. Therefore, as agrarian practices evolve in Kampala wetlands overtime not as root practices but as induced practices by a number of push and pull factors, there is need for comprehensive approach to promote a peaceful co-existence between human agrarian practices and the ecosystem of wetlands. Implications and policy recommendations are therein indicated by the study. However, although the current study has investigated the genesis of agrarian evolution on wetlands in Kampala District, the reasons for rapid transition of wetlands into agrarian centres as well as the effects of agrarian evolution, its time scope is limited to 2010. Thus, leaving a knowledge gap on events that have evolved in the last decade regarding agrarian evolution on wetlands in Kampala to-date. Additionally, there is need to do more research on the history of institutional framework for wetland conservation in Kampala, a study on historical accounts on the impact of traditional control systems for land use on the conservation of wetlands in Kampala, a study seeking an examination of the impact of colonial legacy on land use systems on wetlands of Kampala.

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.0 Introduction

This study examined the agrarian evolution on wetlands in Kampala district in central Uganda, focusing on the areas of Kinawataka, Lubigi and Luzira. The term wetland describes a place where the land is covered by water either salt, fresh or somewhere in between marshes and ponds, the edge of the lake or ocean, the delta at the mouth of the river, low lying areas that frequently flood are all wetlands.[1] Wetlands include peat lands and marshes, rivers and lakes, deltas, flood plains and flooded forests, rice fields and even coral fields. Wetlands exist in every country and in every climatic zone from polar regions to tropics and from high altitudes to dry zones.[2] This dissertation is made up of six chapters. Chapter one deals with the introduction and background to the study, chapter two addresses the geography and history of wetlands in Kampala district, chapter three analyses the genesis of agrarian evolution on wetlands in Kampala, chapter four discuses the reasons for rapid transition of wetlands into agrarian spaces, chapter five examines the impact of agrarian activities on Kampala wetlands, and finally, chapter six handles the conclusion. This chapter specifically covers the background to the study, statement of the problem, main objective, objectives of the study, research questions, theoretical framework, literature review and methodology that was followed in the research. It thus becomes the entry point to this dissertation.

[1]ARCOS.(Undated). Wetlands and Agriculture: Partners for Growth. Kampala: Albertine Rift Conservation Society (ARCOS).
[2]Keddy, P.A. Wetland Ecology: Principles and Conservation. Cambridge University Press, Cambridge, 2000 614 pp.

1.1 Background to the Study

From the conceptual underpinning, the term "agrarian evolution" refers to the process of change and development in the agricultural sector over time.[3] An operational definition of agrarian evolution would outline specific and measurable criteria that indicate how this evolution is occurring.[4]This involves changes in farming techniques which might involve the transition from traditional to modern farming practices, including the use of mechanized equipment, improved irrigation methods, and advanced crop management techniques.[5]Regarding land use patterns, this could track the shift in how land is utilized for agricultural purposes, including changes in crop types, crop rotation practices, and the expansion or reduction of arable land. The scope of agricultural productivity is encompassed with a key indicator of agrarian evolution, this would measure output per unit of agricultural input like land or labour.[6] An increase in productivity could be due to improved technology, better farming practices, or more efficient use of resources.

Regarding the socio-economic impact, this factor would assess how changes in agriculture affect rural communities, including shifts in employment, migration patterns, and income levels.[7] It could also look at how agrarian evolution influences overall economic development. The environmental

[3]Borodkin, L. I. (1988). Two paths of bourgeois agrarian evolution in European Russia: An essay in multivariate analysis. *The Russian Review*, *47*(4), 391-408.
[4]Borodin, V., Bourtembourg, J., Hnaien, F., & Labadie, N.(2016). Handling uncertainty in agricultural supply chain management: A state of the art. *European Journal of Operational Research*, *254*(2), 348-359.
[5]Kansanga, M., Andersen, P., Kpienbaareh, D., Mason-Renton, S., Atuoye, K., Sano, Y., & Luginaah, I. (2019). Traditional agriculture in transition: Examining the impacts of agricultural modernization on smallholder farming in Ghana under the new Green Revolution. *International Journal of Sustainable Development & World Ecology*, *26*(1), 11-24.
[6]Sassenrath, G. F., Heilman, P., Luschei, E., Bennett, G. L., Fitzgerald, G., Klesius, P., & Zimba, P.V. (2008). Technology, complexity and change in agricultural production systems. *Renewable Agriculture and Food Systems*, *23*(4), 285-295.
[7]Lal, P., Alavalapati, J. R., & Mercer, E. D.(2011). Socio-economic impacts of climate change on rural United States. *Mitigation and Adaptation Strategies for Global Change*, *16*, 819-844.

impact would consider how agricultural practices impact the environment, including changes in bio-diversity, soil health, water use, and greenhouse gas emissions. Positive or negative trends in environmental sustainability could be significant markers of agrarian evolution.[8]An operational definition serves to convert the broad, theoretical concept of agrarian evolution into specific, observable, and measurable phenomena. By focusing on these aspects, researchers and policymakers can better understand the dynamics of agricultural change and implement strategies for sustainable development.

The agrarian evolution is the unprecedented increase in agricultural production due to increase in labour and land productivity.[9]Though the roots of agrarian evolution dates back as far as the late medieval period, it was not until the 18thcentury that the increase in agricultural production was realised and began to drastically change the way people lived and, at the same time, changed the landscape forever.[10]One of the prime changes brought on by the agrarian evolution was enclosure, the act by which large tracts of land were fenced in and gazetted for agrarian practices in Britain.[11]These enclosures included open field system, lord of the manor, freeholders or yeomanry, proprietors of large and small properties, copyholders, tenant farmers, cottagers/cottar, squatters mainly in United Kingdom.[12]In the middle ages most land was farmed by individual farmers who

[8]Dumenu, W. K., & Obeng, E. A.(2016). Climate change and rural communities in Ghana: Social vulnerability, impacts, adaptations and policy implications. *Environmental Science & Policy*, *55*, 208-217.

[9]IUCN. Wetlands, Water and the Law using law to advance wetland conservation and wise use, Environment 1999.

[10]Ampaire, E. L., Jassogne, L., Providence, H., Acosta, M., Twyman, J., Winowiecki, L., & Van Asten, P. (2017). Institutional challenges to climate change adaptation: A case study on policy action gaps in Uganda. *Environmental Science & Policy*, *75*, 81-90.

[11]Cox, S. J. B.(1985). No tragedy of the commons. *Environmental Ethics*, *7*(1), 49-61.

[12]Liversage, V.(1945). *Land tenure in the colonies*. CUP Archive.

each had a strip of a large, open field as part of the English manner.[13] Because land was used 'in common', changing land use was not easily implemented, and changes in farming practice were slow to be implemented.[14]

The evolution of intensified agrarian practice roots the way back as early as 1600AD.[15]Indeed, historical accounts reveal that since the Bronze age of 3300 BC, the world has witnessed the emergency of agrarian practices in civilizations such as Mesopotamian Sumer, ancient Egypt, ancient Sudan, the Indus valley civilization of the Indian sub-continent, ancient China, and ancient Greece to 1600 AD, world population continued to grow along with land use, as evidenced by the rapid increase in methane emissions from cattle and the cultivation of rice.[16]

Globally, agriculture began independently in different parts of the world, and included a diverse range of regions such as Western Europe, Latin America, South-East Asia, the Middle East, Northern Africa as well as the Sub-Saharan Africa.[17]At least, all world regions have been part of the agrarian evolution.[18]From the beginning of the civilization, man has used land resources to satisfy his needs. The land resources regeneration was very slow while the population growth was very fast, leading to an unbalance. Agrarian activities began to appear in Europe in the mid-

[13]Pretty, J. N.(1990). Sustainable agriculture in the Middle Ages: the English manor. *The Agricultural History Review*, 1-19.
[14]Ibid.
[15]Sato, Y. "Origin of Agrarian in the Yangtze River basin". In Y. Yasuda (ed.) *The Origins of Pottery and Agriculture*, Roli Books, New Delhi,2003 p. 196
[16]Stromberg, Joseph (2013)."Classical gas".*Smithsonian*. 43 (10): 18.Archived from the original on 15 October 2013. Retrieved 27 August 2022.
[17]Mazoyer, M., & Roudart, L.(2006). *A history of world agriculture: from the neolithic age to the current crisis*. NYU Press
[18]Gerritsen, R. “The Development of Agrarian", Australia and the Origins of Agriculture. . National Geographic, Archaeopress.2016 pp. 29–30.

17th century and it started to grow significantly throughout the 1700s and 1870s.[19] However, in the 17th and 18th centuries, agrarian evolution proved to be a major challenge to many wetlands around the globe.[20]Towards the end of the 18th century, quarter of the wetlands in United States of America had been encroached on and replaced by agricultural farms for example in the Gulf plains of Texas, bottom lands of lower Mississippi among others.[21]

In the Cao Hai wetland reserve in China, there was a serious conflict between Natural Reserve Authority (NRA) and the local communities where the authority rigidly enforced rules that prohibited people from carrying out agriculture in wetlands.[22]The local people in turn saw little option but to challenge the rules due to scarcity of food and increase in population.[23]

As such, the wetlands were degraded; for instance, the forested riparian wetlands adjacent to Mississippi in United States of America during the pre-settlement times had the capacity to store about 60 days of river discharge.[24]However, due to agrarian practices, these wetlands reduced their capacity to less than 12 days.[25] Extensive loss of these wetlands to agrarian activities was a driving

[19]Bassino, J. P., Broadberry, S., Fukao, K., Gupta, B., & Takashima, M. (2011). Japan and the great divergence,730-1870. *London School of Economics, http://www2.lse.ac. uk/economicHistory/whosWho/profiles/sbroadberry.*

[20]Sobhan R Agrarian Reform and Social Transformation: Preconditions for Development. London: Zed Books.1993

[21]Prince, H.(2008). *Wetlands of the American Midwest: a historical geography of changing attitudes* (Vol. 241). University of Chicago Press.

[22]Evans, L. T., Evans, L. T., & Evans, L. T. E. (1998). *Feeding the ten billion: plants and population growth*. Cambridge University Press

[23]Glennon, R. (2004). Water scarcity, marketing, and privatization. *Tex L. Rev.*, *83*, 1873.

[24]Michener, W. K., Blood, E. R., Bildstein, K. L., Brinson, M. M., & Gardner, L. R. (1997). Climate change, hurricanes and tropical storms, and rising sea level in coastal wetlands. *Ecological Applications*, *7*(3), 770-801.

[25]Braskerud, B. C. (2002). Factors affecting phosphorus retention in small constructed wetlands treating agricultural non-point source pollution. *Ecological Engineering*, *19*(1), 41-61.

factor to the severity and damage of 1993 floods in Mississippi basin.[26] Similarly, the flood on Bassee river in France performs a natural service by providing an over-flow area when Seine river floods upstream of Paris.[27]It is also estimated that over 50% of some wetland types in North America, Europe, New Zealand, and Austria have been lost largely as a consequence of agrarian practices.[28] Therefore, the global status of contemporary agrarian practices remains the greatest threat to natural wetlands across the globe. While these examples show the degradation of wetlands, little focus has been put on how agriculture has evolved in these areas.[29]

In Africa, agriculture has for a long time been associated with features of wetland, with millions of hectares of wetlands supporting wide range of agricultural activities.[30] Conversely, many wetlands are threatened by agricultural practices. As human population increase, the values of wetlands also increase especially for agricultural purposes for example, wetlands in Zambezi river basin are estimated to be 50% in terms of crops alone.[31] Wetlands are perceived as new frontiers for agriculture and this is partly due to population increase in Africa.

[26]Daily G C; Alexander S etal ecosystem services; benefits supplied to human societies by natural ecosystems pg-20-34 1997

[27]Laurans. Y social economic valuation of the environment in the context of justification conflicts; developments of concepts and methods through examples of water management in France pg-94-115 2001

[28]Brinson, M. M.,& Malvárez, A. I. (2002). Temperate freshwater wetlands: types, status, and threats. *Environmental conservation*, *29*(2), 115-133.

[29]Verhoeven, J. T., & Setter, T. L.(2010). Agricultural use of wetlands: opportunities and limitations. *Annals of botany*, *105*(1), 155-163.

[30]Sakané, N., Alvarez, M., Becker, M., Böhme, B., Handa, C., Kamiri, H.& van Wijk, M. T. (2011).Classification, characterisation, and use of small wetlands in East Africa. *Wetlands*, *31*(6), 1103-1116.

[31]UNEP(United Nations Environment Program). *African environment outlook2; our environment, our wealth.* Nairobi Kenya 2006 pg-6-9

Lake Chilwa wetland covers an area of 2,248km and consists of a shallow open water lake surrounded by reed swamp.[32] It is the most important wetland in Malawi yet it has been converted into agrarian activities due to the fact that it is occupied by two million people who depend on agrarian activities.[33] Although wetland agriculture can bring significant benefits in terms of food security, health among others, ill-considered development often results into wetland de-gradation, deleterious environment impact and harmful consequences to people's lives.

The evolution of agriculture in the swamps around Kampala, Uganda, is deeply inter-twined with the region's environmental, socio-economic, and political history. While specific historical events directly concerning agrarian evolution in Kampala's swamps may not be widely documented in global history, several key developments in the broader context of Uganda's agricultural history and the management of its wetlands (including swamps) provide insight into how agriculture in the Kampala region has evolved.[34]

Before the arrival of European colonialists, the indigenous people in Kampala practiced subsistence farming along with hunting and gathering. The wetlands and swamps were used for fishing and as sources of water and materials like papyrus. Agriculture was mainly rain-fed with crops like bananas, millet, and root crops being predominant.[35] With the establishment of British colonial rule, there was a shift towards cash crops to serve the needs of the British Empire. Cotton

[32]Rebelo, L. M., McCartney, M. P.,& Finlayson, C. M. (2010). Wetlands of Sub-Saharan Africa: distribution and contribution of agriculture to livelihoods. *Wetlands Ecology and Management*, *18*(5), 557-572.
[33]Jamu, D, l m Campbell etal. Trans boundary management plan for Lake Chilwa catchment area; highlighting the impact of North South Research collaboration among Canadian pg-33-45 2006.
[34]Wandera, P. (2014). *The political ecology of unplanned land use changes in Kampala City, Uganda: a case of selected parishes of Kawempe Division* (Master's thesis, NTNU).
[35]Smith, A. B.(2019).Ancient and Traditional Agriculture, Pastoralism, and Agricultural Societies in Sub-Saharan Africa. In *Oxford Research Encyclopaedia of Environmental Science*.

and coffee became major crops. Although the primary focus was on highland areas, the colonial administration's policies, including land tenure changes and the introduction of cash crops, had widespread effects on agricultural practices across Uganda, including the areas around Kampala.[36]

Wetlands were considered as great sources of natural ecological zones and thus respected by people through their cultures and traditions.[37] From the period 1900 to the 1980s, most of the wetlands in Kampala were looked at as more of waste-lands and as wellno proper and direct care by the government. Such a situation later attracted agrarian activities.[38] The most common agrarian activities carried out in most wetlands of Kampala included crop cultivation covering about three quarters of the reclaimed area, papyrus harvesting, fish farming and livestock keeping.[39]

Kinawataka, Luzira and Lubigi wetlands were named after the areas that occupy and run through. Before 1900, these wetlands were first used by household Baganda in Kampala who knew the importance of wetlands as either traditional ritual or spiritual zones for cleansing and treatment of traditional illnesses or subsistence agriculture.[40]Attempts by city planners to protect wetlands in Kampala begun in1912 when a series of physical planning schemes were initiated by the colonial government. This was followed by a series of others in 1919, 1930, 1972 and in 1994 when a structural plan was made. Despite these planning schemes, developments in Kampala especially

[36]Byakagaba, P., Egeru, A., Barasa, B., & Briske, D. D. (2018). Uganda's rangeland policy: intentions, consequences and opportunities. *Pastoralism, 8*, 1-16.
[37]*P. Oosterveer and V. B. Vliet, "Environmental Systems and Local Actors: Decentralizing Environmental Policy in Uganda," Environmental Management, Vol. 45, No. 2, 2010, pp. 284-295. doi:10.1007/s00267-009-9423-4 [Citation Time(s):4]*
[38]*Were, A. N., Isabirye, M., Poesen, J., Maertens, M., Deckers, J., &Mathijs, E. (2013). Decentralised governance of wetland resources in the Lake Victoria Basin of Uganda*
[39]*Ibid*
[40]*Okurut, O. J. (2009). Environmental communication and wetland conservation: a study of how NEMA uses communication to raise awareness and promote wetland conservation in Kinawataka and Nakivubo wetlands in Kampala, Uganda (Master's thesis).*

commercial agronomy continued to be haphazard, unplanned and located outside planned area thus, continued impact on the wetlands.[41]

By 1920, people had begun inheriting and buying *bibanja (plots)* around Kampala wetlands which gave them a lot of confidence to utilize these wetlands formally for using them for agrarian practices which have persisted to-date.[42]Land acquisition in wetlands has been blamed on government authorities' failure to implement/enforce the planning schemes, continued political interference, conflicting land use policies, uncoordinated instructions between KCC and Ministry of Local Government and at times State House.[43]

By 1950s, wetlands in Kampala had been commercialised for cultivation of plants such as sugar-cane and cocoyam, which thrived well in waterlogged soils. Besides, population pressures in the area surrounding these wetlands were on increasing trajectory of population by late 1950s.This came along with continued removal of the endemic papyrus vegetation in favour of the agricultural crop production mainly cocoyam.[44]

After gaining independence in 1962, Uganda went through several political upheavals that affected its agricultural sector, including the dictatorships of Milton Obote and Idi Amin Dada.[45] During these times, attention to agricultural development and wetland management was minimal, leading

[41]*Bashaasha, B., Mangheni, M. N., &Nkonya, E.(2011).Decentralization and rural service delivery in Uganda. Internet. Food Policy Research Inst.*
[42]*Kalanzi, W.(2015).Local governments and wetland conservation in Uganda: contributions and challenges. Journal of Public Administration, 50(1), 157-171.*
[43]*Businge, Z.(2017).Drivers of wetland degradation in Western Uganda and Iceland, and how they are addressed in current policies and legal frameworks. United Nations University Land Restoration Training Programme [final project].*
[44]*Goodfellow, T.(2013). Planning and development regulation amid rapid urban growth: Explaining divergent trajectories in Africa. Geoforum, 48, 83-93.*
[45]Mwakikagile, G. (2012). *Obote to Museveni: Political transformation in Uganda since independence*. New Africa Press

to decreased production and environmental degradation in some areas. Recognizing the ecological importance of swamps and wetlands, the Ugandan government, through the National Environment Management Authority (NEMA), began implementing policies in the 1990s for the conservation and wise use of wetlands. This included restrictions on the drainage of wetlands for agriculture.[46]However, there has been a continuous tension between conservation efforts and the needs of local communities to use these lands for agriculture, especially in rapidly urbanizing areas like Kampala.

Following the closure of the former Jinja Industrial hub in late 1950s and 1960s, there was a re-location of most of the former industrial labour to Kampala and majority decided to encroach on public nature of wetland resources for agriculture so as to earn a living.[47]For instance, accounts indicate that most of the former employees from the Jinja industrial hub settled around Kinawataka and Luzira wetlands and resorted into urban agrarian practices that have grown over time since then.[48]The economic decay and civil war of the 1970s and 1980s left majority of the residents in Kampala with no choice but resort to wetlands for both settlement and agriculture. By 1971, the removal of papyrus vegetation in favour of agricultural activities became more prominent but with significant implications for the physical structure of the wetland due to changes in both the plant canopy and the rhizome system

[46]Junk,W.J.(2002).Long-term environmental trends and the future of tropical wetlands. *Environmental conservation*, *29*(4), 414-435.
[47]*Nyakaana, J. B., Sengendo, H., &Lwasa, S. (2007). Population, urban development and the environment in Uganda: the case of Kampala city and its environs. Faculty of Arts, Makerere University, Kampala, Uganda, 1-24.*
[48]Nord, C.&Byerley, A. (2020). Translocal optimisation: assembling rural and urban spaces for later life in urban Namibia and Uganda. *Journal of Southern African Studies, 46*(1), 109-127.

This reveals the extent to which by 1970, agrarian practices were already encroaching on the vegetation of wetlands in Kampala. This and other socio-economic factors have contributed to agriculture being a visible part of the city's wetland life.[49]Between 1980 and 2002, agriculture contributed to 62.2% of encroachment on wetlands in Kampala coupled with increase in urban population.[50]In 1989, there was an establishment of the National Wetlands Program of Uganda with the aim of assisting the government in the development of a national policy for the conservation and management of wetlands. This came with a lot of expectations to create alternatives to unsustainable use and abuse of wetlands as well as streamlining wetland management.[51]However, from the accounts given from the field, these hopes seem to have been frustrated by the increasing encroachment on wetlands by agriculturalists.

Therefore, the hopes that had been raised following the establishment of the National Wetlands Program of Uganda have not met the expectations of Ugandans in terms of protecting wetlands in Kampala from agrarian practices. Before 1990, most parts of Lubigi Wetland were known for permanent mosaic of water and herbaceous or woody vegetation that covered extensive areas. However, from 1990 onwards, the wetland experienced an occupation by human activity mainly with livestock activities and wetlands with crop farmland activities.[52]From 1994 onwards, agrarian

[49]*Isunju, J. B., Orach, C. G., & Kemp, J. (2016).Community-level adaptation to minimize vulnerability and exploit opportunities in Kampala's wetlands. Environment and Urbanization, 28(2), 475-494. Johns, T, etal.(2013).*
[50]*Saunders, M. J., Kansiime, F., & Jones, M. B. (2012).Agricultural encroachment: implications for carbon sequestration in tropical African wetlands. Global Change Biology, 18(4), 1312-1321.*
[51]*Waswa, H., Kakembo, V., &Mugagga, F(2019). A spatial and temporal assessment of wetland loss to development projects: the case of the Kampala–Mukono Corridor wetlands in Uganda. International journal of environmental studies, 76(2), 195-212.*
[52]*David S. et al.(2010) Changing Trends in Urban Agriculture in Kampala. In: Prain G., Lee-Smith D.,Karanja N.(eds) African Urban Harvest. Springer ,New York https://doi.org/10.1007/978-1-4419-6250-8_6*

activities on this wetland increased from 14% to 18% and the intact wetland had decreased by 46%. Besides, the quality of water flowing into and out of upper Kinawataka wetland had been affected partly by agriculture.[53]By 1999, a lot of cocoyam led to the removal of the aboveground papyrus vegetation and the rhizomes were left to decompose.[54]By 2000, these wetlands had witnessed anthropogenic human activities mainly agrarian activities that posed the biggest threat to Lubigi wetland ecosystems in Kampala. The agrarian activities done mainly for short-term human consumptive purposes, they have been increasingly affecting the ecosystem of the wetland as more wetland areas have been lost to agricultural activities.[55] Besides, by 2007, anthropological agrarian activities such as draining away of water for agriculture and livestock farming, harvesting of Cyperus papyrus and other plants had reduced

In Kampala, there has been a noticeable trend towards urban agriculture, including the use of wetlands for farming within the city limits. This practice has been both a means of livelihood for urban dwellers and a source of contention due to the environmental impact on these ecologically sensitive areas.[56] The recent focus has been on sustainable agricultural practices and climate resilience. Efforts to adapt to climate change have led to an increased interest in integrating wetland conservation with agriculture, such as using less water-intensive crops and sustainable water management practices. While these points provide a broad overview, it is important to note that

[53] Ibid

[54]*Chalin, V., Golaz, V., &Médard, C.(2015). Land titling in Uganda crowds out local farmers. Journal of Eastern African Studies, 9(4), 559-573.*

[55]*Sebastian, R., Kubota. A .etal (2008) The association between household food security and urban farming in Kampala. In: Cole, D., Lee-Smith, D and Nasinyama, G (Eds), Healthy city harvests: Generating evidence to guide policy on urban agriculture. International Potato Center (CIP) and Makerere University Press.*

[56]Sabiiti, E. N., Katongole, C. B., Katuromunda, S., Sengendo, H., Basalirwa, C. P.,Atukunda, G.,& Nambuubi, S. K.(2014).Assessing urban and peri-urban agriculture in Kampala, Uganda. *Building Urban Resilience; Padhgam, J., Jabbour, J., Eds*.

the specific historical events and evolutions in agrarian practices in Kampala's swamps are part of a larger and complex narrative of Uganda's environmental, social, and economic history.[57] The ongoing challenge remains balancing agricultural development with environmental conservation in the face of urbanization and climate change.

Uganda has fertile soils of 64.5% of its land area suitable for agriculture and 27% cultivable.[58] Access to productive land and water, however, highly differ in different regions of the country and among different population groups.[59] Only 0.1% of land is under irrigation, so majority of the farmers majorly depend on rainfall. Due to inequitable access to land and insecure tenure rights, land is not optimally and sustainably used, this has resulted to agrarian evolution on wetlands in Uganda.[60] The land management institutions like Uganda Land Commission, Land Registry, and the District Land Boards among others are generally weak and have not facilitated rapid progress to goals laid out in legislation of land policy and this has resulted into increased encroachment on wetlands by people who are doing farming, hence agrarian evolution.[61]

[57]Doyle-Raso, J.(2022). *The Origination and Implementation of the National Wetlands Policy of Uganda: Environment, Knowledge, and Power from the Late Nineteenth Century to Present*. Michigan State University

[58]Place, Frank, etal Population pressure, land tenure and tree resource management in Uganda pp. .26-45 2000

[59]Scherr, S. J.(2000). A downward spiral? Research evidence on the relationship between poverty and natural resource degradation. *Food policy*, *25*(4), 479-498.

[60]Nkonya, E., Pender, J., Kaizzi, K. C., Kato, E.,Mugarura, S.,Ssali, H., & Muwonge, J. (2008). *Linkages between land management, land degradation, and poverty in Sub-Saharan Africa: The case of Uganda* (Vol. 159). Intl Food Policy Res Inst.

[61]Deininger, K.,& Feder, G. (2009). Land registration, governance, and development: Evidence and implications for policy. *The World Bank Research Observer*, *24*(2), 233-266.

Wetlands are commonly known as swamps in Uganda and are a resource of considerable importance just like forests, range-lands, arable land, among others.[62]Wetland resource in Uganda have traditionally been utilised by the people as a source of raw materials for construction, mining among others. In addition, seasonal wetlands and margins of permanent wetland have been used for crop growing.[63] Despite several values, wetlands have hitherto been regarded as waste lands and many have been re-claimed for various activities including agriculture.[64]

Over the years, devastation of wetlands has been attributed to accelerated agrarian activities especially near the Kampala metropolitan region.[65] The government has enacted several Acts and laws to prohibit agrarian activities in the wetlands, as well as punishment systems for environmental pollution have also been put in place. These included adoption of the National Policy for the Conservation and Management of Wetland Resources to promote their conservation in order to sustain their values for the present and future well-being of the people among others.[66] However, other than developing such laws and policies, their implementation has not been as robust as expected. For instance, enforcement of formal regulations for wetland uses and

[62]Nyakaana, J. B. (Undated). Population, Urban Development and the Environment in Uganda: The Case of Kampala City and its Environs. Kampala: Geography Department, Makerere University. Quora. (2016, October 22).
[63]Gopal, B., & Sah, M.(1995). Inventory and classification of wetlands in India. In *Classification and inventory of the world's wetlands* (pp. 39-48). Springer, Dordrecht.
[64]Mudappa, D. I. V. Y. A., Raman, T. S., Shahabuddin, G., & Rangarajan, M.(2007). Rainforest restoration and wildlife conservation on private lands in the Western Ghats. *Making conservation work*, 210-240.
[65]Scheren, P. A. G. M., Zanting, H. A., & Lemmings, A. M. C.(2000). Estimation of water pollution sources in Lake Victoria, East Africa: application and elaboration of the rapid assessment methodology. *Journal of environmental management*, *58*(4), 235-248.
[66]Finlayson 1, C. M., Davidson 2, N., Pritchard 3, D., Milton 4, G. R., & MacKay 5, H.(2011). The Ramsar Convention and ecosystem-based approaches to the wise use and sustainable development of wetlands. *Journal of International Wildlife Law & Policy*, *14*(3-4), 176-198.

agriculture has not succeeded partly due to lack of the required resources to monitor and police wetland utilisation in different parts of the country.[67]

In Uganda, Wetlands are estimated to cover about 13% of the total land surface area (about 30,000 km^2) of the country and represent a considerable ecological, social and economic value.[68]In 1989, the Ugandan government formerly recognised that wetlands need to be conserved because they contribute considerably to the national economy and rural livelihood.[69]

Despite the above efforts that have been put in place to conserve the wetlands from the threats of agrarian practices in Uganda, these conservation efforts have provoked conflicts between the land users and the policy makers, in particular to the demarcation of areas for conservation.[70]The result being that such wetlands have been exposed to agricultural activities, which have been growing to different rates in different areas over time. This study, therefore, focused on the three major wetlands in Kampala which are, Kinawataka, Luzira and Lubigi wetlands to analyse the evolution of agriculture in those areas.[71] These three wetland areas are important resources that are basic to

[67]Myers, S. C., Clarkson, B. R., Reeves, P. N., & Clarkson, B. D. (2013). Wetland management in New Zealand: Are current approaches and policies sustaining wetland ecosystems in agricultural landscapes? *Ecological Engineering*, *56*, 107-120.
[68]Bikangaga, S., Picchi, M. P., Focardi, S., & Rossi, C. (2007). Perceived benefits of littoral wetlands in Uganda: a focus on the Nabugabo wetlands. *Wetlands Ecology and Management*, *15*(6), 529-535.
[69]Ibid Bikangaga et al.,(2007)
[70]Turyahabwe, N., Kakuru, W., Tweheyo, M., & Tumusiime, D. M.(2013). Contribution of wetland resources to household food security in Uganda. *Agriculture & Food Security*, *2*(1), 1-12.
[71]Kakuba, S. J., & Kanyamurwa, J. M.(2021).Management of wetlands and livelihood opportunities in Kinawataka wetland, Kampala-Uganda. *Environmental challenges*, *2*, 100021.

agrarian practice including fishing, water utilization, crop growing, livestock, and more recently, agro-based tourism.[72]

In the context of the agrarian evolution in the Kinawataka, Lubigi, and Luzira wetlands of Kampala, Uganda, can be traced back to the interplay between human settlement expansion, agricultural practices, and environmental management within these ecosystems.[73]Although detailed historical records specifically about agrarian practices in these wetlands might not be widely available, the general evolution of agriculture in wetland areas around Kampala and similar urban settings can provide valuable insights.[74]

Pre-colonial period historically, the areas around what is now Kampala, including its wetlands, were populated by various Bantu-speaking groups who practiced subsistence agriculture alongside hunting and gathering.[75] These communities had a deep understanding of their local ecosystems, which influenced their farming practices. They cultivated crops such as bananas, millet, and root crops like yams and sweet potatoes. The wetlands were less interfered with, mainly serving as sources of water, fish, and other aquatic resources, as well as being used for ritual purposes.

[72]Rebelo, L. M., McCartney, M. P., & Finlayson, C. M. (2010). Wetlands of Sub-Saharan Africa: distribution and contribution of agriculture to livelihoods. *Wetlands Ecology and Management*, *18*, 557-572.
[73]Isunju, J. B. (2016). *Spatiotemporal analysis of encroachment on wetlands: hazards, vulnerability and adaptations in Kampala City, Uganda* (Doctoral dissertation, Stellenbosch: Stellenbosch University).
[74]Matovu, B., Sarfo, I., Bbira, Y.Yeboah, E.,& Muhoozi,Y.(2023). Navigating Through Complexity: Profiling the main threats to Sustainable Tropical Wetlands Management and its Implications to livelihoods welfare and ecosystem governance: A Case Study of Mityana District, Uganda.
[75]Tosh, J. (1973). *Political authority among the Langi of northern Uganda, circa 1800-1939*. University of London, School of Oriental and African Studies (United Kingdom).

The colonial period brought significant changes to Uganda's agricultural landscape, with the introduction of cash crops like cotton and coffee. Post-independence Uganda saw further shifts in its agricultural practices and policies, with varying impacts on land use and environmental management.[76]Urbanization, particularly in Kampala, increased pressure on wetlands due to land conversion for agriculture, settlement, and industrial development.

In recent decades, the Kinawataka, Lubigi, and Luzira wetlands have seen intensified agricultural activities.[77] As Kampala expanded, the surrounding wetlands became attractive for both formal and informal agricultural practices, partly due to their fertile soils and the availability of water.[78]Urban farmers in these wetlands grow a variety of crops, including vegetables and medicinal plants, which are vital for urban food security.

Increased agricultural activities, alongside industrial development and waste disposal, have led to significant environmental degradation of these wetlands.[79]Efforts have been made by both government and non-governmental organizations to balance agricultural practices with conservation needs, promoting sustainable agriculture and wetland restoration projects. The economic pressures and the need for livelihoods in a rapidly urbanizing city have driven many to

[76]Jørgensen, J. J. (2023). *Uganda: a modern history*. Taylor & Francis
[77]Turpie, J., Day, L.,Gelo Kutela, D., Letley, G., Roed, C., & Forsythe, K. (2016). A preliminary investigation of the potential costs and benefits of rehabilitation of the Nakivubo Wetland, Kampala.
[78]Wilobo John, B. (2012). The role of subsistence agriculture on wetland conservation: a case study of Bugolobi, Nakawa Division.
[79]Sabiiti, E. N., Katongole, C. B., Katuromunda, S., Sengendo, H., Basalirwa, C. P.,Atukunda, G., & Nambuubi, S. K.(2014).Assessing urban and peri-urban agriculture in Kampala, Uganda. *Building Urban Resilience; Padhgam, J., Jabbour, J., Eds*.

utilize wetland areas for agriculture.[80]This has included both small-scale subsistence farming and, to a lesser extent, more commercial agricultural ventures.

Government policies and regulations regarding wetland use have evolved, often oscillating between promoting conservation and allowing certain degrees of agricultural use. The effectiveness of these policies in balancing ecological conservation with the needs of urban farmers has been a matter of ongoing debate. The agrarian evolution in the Kinawataka, Lubigi, and Luzira wetlands reflects a broader trend of urban agriculture within African cities, where wetlands are critical yet vulnerable eco-systems.[81] Balancing the ecological integrity of these areas with the socio-economic benefits derived from them remains a key challenge for sustainable urban development in Kampala and similar contexts, hence, the agricultural evolution that affected so much the wetlands of Kinawataka, Lubigi and Luzira in Kampala. It is on this basis that this study examines this evolution to explain the causes and impact on the country.

1.2 Statement of the Problem

Like other parts of Africa and the World at large, wetlands in Uganda have been seriously affected by agricultural activities.[82] Despite government intervention through legislation, many wetlands have been encroached upon by people who have cultivated and grown their crops such as yams, banana, sugarcanes, and cassava among others.[83] Unlike in other parts of Uganda, Africa and the whole world where various studies have been done to explain this phenomenon, there is scanty information to explain why a number of wetlands have been turned into agricultural lands in

[80]Kwesiga, M.(2008). Effects of Population Growth and Urban Development on Wetlands in Kampala City: A Case of Kansanga Wetland.
[81]Kwesiga, M.(2008). Effects of Population Growth and Urban Development on Wetlands in Kampala City: A Case of Kansanga Wetland.
[82]The wetland status report for Kampala district, Department of environmental protection
[83]Status of environmental report for Uganda Kampala national environmental authority

Kampala. Available information shows that studies concentrate on the general de-gradation of wetlands and the dangers wetland de-gradation brings such as floods, nutrient run-off, and water pollution among others.[84]This has led to rapid growth of wetlands into farm lands and settlement centres. For instance, it is estimated that agriculture accounts for over 80% of wetland use in Uganda.[85]It is on such background that this study examines the genesis and development of agrarian development on wetlands in Kampala district from 1900-2010.[86] This is important in explaining the circumstances that have led to the evolution, trends and general impact on wetlands themselves and the surrounding areas.

1.3 Main Objective of the Study

This study examined the agrarian evolution on wetlands in Kampala district from 1900-2010.

1.4 Specific Objectives

The study was guided by the following specific objectives;

1. To examine the genesis of agrarian evolution on the wetlands in Kampala.

2. To discuss the reasons for rapid transition of wetlands of Kinawataka, Luzira and Lubigi into agrarian spaces in Kampala District.

3. To analyse the impact of agrarian evolution on wetlands in Kampala.

1.5 Research Questions

The study was be guided by the following research questions;

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[84] Status of environmental report for Uganda Kampala national environmental authority

[85]Paul, E,& Emokori, O. (2018). *Farming in wetlands and developmental degradation* (Doctoral dissertation, Kampala International University. College of Humanities and Social Sciences).

[86]Odeke, C. (2019). *Wetland degradation and carbon sequestration potential–a case of Lubigi wetland, Uganda* (Doctoral dissertation, Kyambogo University

1. What is the genesis of agrarian evolution on wetlands in Kampala?

2. What are the reasons for rapid transition of wetlands of Kinawataka, Luzira and Lubigi into agrarian spaces in Kampala District?

3. What is the impact of agrarian evolution on wetlands in Kampala District?

1.6 Scope of the Study

1.6.1 Content Scope

The study concentrated on agrarian evolution on Kinawataka, Luzira and Lubigi wetlands in Kampala District, the content sought an examination of the genesis of agrarian evolution on the wetlands in Kampala. Besides, it also discussed the reasons for rapid transition of wetlands of Kinawataka, Luzira and Lubigi into agrarian spaces in Kampala District as well as analysing the impact of agrarian evolution on wetlands in Kampala.

1.6.2 Geographical Scope

For the purposes of this research, the focus was on the three largest wetlands in Kampala; Kinawataka, Luzira and Lubigi. Kinawataka is part of a tributary system in which waters flow south towards Lake Victoria. Lubigi is located on the North-West side and is part of a system in which waters flow north towards to Lake Kyoga and Kinawataka which is also referred to as Kinawataka-Kawoya which is 1.5 km^2 located in Nakawa Division, 6.5 km east of city centre. It is one of the largest wetlands in Kampala and is currently 5.29 km^2. Luzira wetland is located in the eastern part of Kampala city yet Lubigi wetland feeds into Lake Kyoga and is located on the North-West side of Kampala. It is a tributary to Mayanja-Kato system in the north and receives water from Nsoba wetland system. Lubigi covers parts of Rubaga and Kawempe sub-counties and is 7.5 km west of Kampala City Center. Masaka road, Mityana road, Hoima road and Sentema road all cross through this wetland. Lubigi is currently 2.85 km^2.

1.6.3 Time Scope

This study concentrated on a period between 1900-2010.The year 1900 was chosen as the starting year because it is when all wetlands in Uganda were turned into Crown Land. During this period, they were supervised by the colonial governors where no person was allowed to encroach on them. The year 2010 was chosen as the terminal point because it is when the Policy Committee on Environment toured wetlands in Kampala district and noted with concern the illegal Act of issuing land tittles in wetlands and ordered Kampala city council to counsel all land titles in wetlands.

1.7 Significance of the Study

Primarily, the findings of this study are important to the academia in two-fold. Basically, the findings add on the existing body of knowledge by filling the knowledge gaps related to the evolution of agricultural activities in wetlands of Kampala. Secondly, the findings respond to the existing debate contradictions on the factors and events associated with agrarian evolution in wetlands of Kampala.

1.8 Literature Review

This section analyses the literature review dealing with the genesis of agrarian evolution in Kampala wetlands putting focus on Kinawataka, Lubigi and Luzira wetlands. It also analyses the impacts of the agrarian evolution in wetlands on the people of Kampala and Uganda at large. In doing so, a perusal of the existing relevant literature was conducted and knowledge gaps identified as a way of justifying this study. Besides, contradictory debates trying to explain issues regarding agrarian evolution on wetland utilization in Kampala. This section was also important in highlighting how this study relates with valuable literature.

1.8.1 The Genesis of Agrarian Evolution on Wetlands

In 1949 Sanjiang plain in Heilongjiang province in China comprised a vast wetland, system of rivers seasonally flooded marsh and grassland stretching over 5.36mha.[87] Today, the wetland is reduced to just 0.8mha.China`s economic progress and conversion of the Sanjiang wetlands to agrarian activities due to government policies.[88] It is noted that the conversion of Sanjiang plain into agrarian activities is attributed to government policies.[89] For the case of Uganda, the government has tried to protect wetlands through legislation of laws but they are almost coming to extinction due to agrarian activities.[90] However, the unanswered question remains around the genesis of agrarian evolution on wetlands in Uganda particularly Kampala District thus providing knowledge gap that has been filled by this study.

Following the communist revolution of 1917 and the end of World War II in 1945, food security emerged as a primary constituent of national development and the conversion of wetlands for agriculture became a dominant feature of national policy throughout the second half of the 20th century.[91] Therefore, policies of population expansion and internal migration encouraged the opening of the new farmlands by discharged soldiers of the World War II by 1950s.[92] Further conversion occurred in 1960s when as part of the Cultural Revolution, urban youth were sent to work in agrarian communities and as a result of these policies more than 7million people moved

[87]Maltby E Functional assessment of wetlands USA 2009
[88]Ibid
[89]Wang, Z., Song, K., Ma, W., Ren, C., Zhang, B., Liu, D. & Song, C.(2011). Loss and fragmentation of marshes in the Sanjiang Plain, Northeast China, 1954–2005. *Wetlands*, *31*(5), 945.
[90]Ogwang, T., & Vanclay, F.(2021). Cut-off and forgotten? Livelihood disruption, social impacts and food insecurity arising from the East African Crude Oil Pipeline. *Energy Research & Social Science*, *74*, 101970.
[91]Ibid
[92]Daniel, P. (2000). *Lost Revolutions: the South in the 1950s*. University of North Carolina Press.

to Heilongjiang province and farm lands that covered 811,000 ha of Sanjiang wetland.[93] On contrarily, Uganda population cannot be compared to that of China so if conversion of wetlands into agriculture is attributed to population increase and internal migration, what is the genesis of agrarian evolution on wetlands in Uganda particularly Kampala District? This creates a knowledge gap that has been filled by this study.

In Nigeria, Hadejia-Nguru wetland supports a population of 18 million people of whom 1.5 million people reside in the wetland.[94]The predominance of agriculture indicates a high dependence on the wetland which in the long run will lead to the extinction of this wetland.[95]

The mid-19th century saw wetlands reclaimed for agricultural diversification and food security in Gambia mainly the growing of groundnuts.[96]With irrigation schemes being implemented in lowland swamps to encourage year-round cultivation, agrarian practices have given rise to new claims over the communal tenure systems prevalent in lowland environments and allows male household heads to encroach on wetlands for food security.[97]Thus, the Gambians have extensively encroached on wetlands for commercialized production of farm products for food security.[98]

The existing knowledge gap in this literature is that accounts of agrarian evolution in wetlands have been given in many parts of the world but not in Uganda and specifically in Kampala.

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[93]Ibid

[94]Ringim, A. S., Abubakar, M. M., Mohammed, S. I., & Shuaibu, T. U.(2015). Wetlands resource use, conflict, management and conservation: review of the Hadejia-Nguru wetlands, northeast, Nigeria. *Int. J. Innovat. Sci. Eng. Technol*, *2*, 507-516.

[95]Lemly, A. D., Kingsford, R. T., & Thompson, J. R.(2000). Irrigated agriculture and wildlife conservation: conflict on a global scale. *Environmental management*, *25*(5), 485-512.

[96]Swindell, K., & Jeng, A.(2006). Food Farming and the Groundnut Trade. In *Migrants, Credit and Climate* (pp. 68-99). Brill.

[97]Carney, J.(1993). Converting the wetlands, engendering the environment: The intersection of gender with agrarian change in the Gambia. *Economic Geography*, *69*(4), 329-348.

[98]Ibid

Besides, although in many countries, governments have made policies supporting wetland utilisation for agrarian practices to ensure food security but in Uganda, government policies have been directed towards protecting wetlands from agrarian practices yet there is rapid transition of these wetlands into agrarian spaces. These contradictions in debates accounting for the agrarian evolution in wetlands prompted this study to be conducted.

1.8.2 The Reasons for Rapid Transition of Wetlands into Agrarian Spaces

Worldwide, wetlands have been drained to convert them into agricultural land or industrial and urban areas with a realistic estimate of 50% of the world's wetlands that have been lost.[99] Among the South-East Asian countries such as Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam, wetlands are perceived as species-rich habitats performing valuable eco-system services such as flood protection, water quality enhancement, and food chain support and carbon sequestration.[100]The South-East Asia countries have adopted policies for extensive food production of food mainly rice from wetlands for food security but with strict emphasis on environmental conservation practices.[101]However, it was not yet clear for the case of Uganda on whether most of the food security promotion policies pay attention to environmental conservation of wetlands. Thus, leaving a gap in explaining the reasons for agrarian evolution in wetland areas in Kampala which is not an agro-based district but rather, an industrial hub.

[99]Jos T. A.Verhoeven, Tim L. Setter, Agricultural use of wetlands: opportunities and limitations, *Annals of Botany*, Volume 105, Issue 1, January 2010, Pages 155–163, https://doi.org/10.1093/aob/mcp172

[100]Jos T. A. Verhoeven, Tim L. Setter, Agricultural use of wetlands: opportunities and limitations, *Annals of Botany*, Volume 105, Issue 1, January 2010, Pages 155–163, https://doi.org/10.1093/aob/mcp172

[101]Redfern, S. K., Azzu, N., & Binamira, J. S.(2012). Rice in Southeast Asia: facing risks and vulnerabilities to respond to climate change. *Build Resilience Adapt Climate Change Agri Sector*, *23*(295), 1-14.

In an analysis on the changing wetland paradigm by Maltby, it was revealed that swamps, marshes, floodplains and mangrove forests, all known as wetlands, are a precious resource although many urban dwellers have decided to utilize for agriculture.[102] In their natural state they provide a range of eco-system services.[103] They regulate water flows, store eroded materials and nutrients and provide water, food and raw materials.

Throughout history, the general trend has been to convert wetlands from their natural state to allow other more intensive uses including agriculture.[104] For instance, in most regions of the world including Asia, Latin America, Africa and some parts of Europe, wetlands have been encroached on through the creation of rice paddies, sugar estates or even fish farms.[105]

In further review, it was established that in Europe, North America, Australia and New Zealand, more than 50% of wetlands were converted to agriculture during the 20th century through controlled flooding and drainage. Mostly, they were used for intensive farming and urban development.[106] However, the reasons for conversion of wetlands into agricultural centres in the above mentioned area are well explained yet no study has been conducted on reasons why Kampala wetlands have been turned into agrarian centres.

[102]Maltby, E. (2009). The changing wetland paradigm. *The wetlands handbook*, 3-43.
[103]Ibid
[104]Clarkson, B. R., Ausseil, A.G.E., &Gerbeaux, P.(2013).Wetland ecosystem services. *Ecosystem services in New Zealand: conditions and trends. Manaaki Whenua Press, Lincoln, 1*, 192-202.
[105]Wood, P. (2002). Out of Africa: Rice Culture and African Continuities. *Black Rice: The African Origins of Rice Cultivation in the Americas*, 69.
[106]Wood A. Valuing wetlands for livelihoods as the basis for sustainable management 2009

Wetlands contribute in diverse ways to the livelihoods of millions of people in Sub-Saharan Africa but in many places, they are inextricably linked to cropping and livestock management systems.[107] At the same time, increasing population in conjunction with efforts to increase food security is escalating pressure to expand agriculture within wetlands.[108]In Tanzania, the reliance of communities on both wetland agriculture and natural resources is driven by incentives to manage wetland resources that will differ markedly, not only from one location to another, but also across socio-economic groups within the same community.[109]

In recent decades, particularly in Africa, wetlands have become a new agricultural frontier. In response, a number of agencies are trying to explore sustainable wetland management as a way of reducing rural poverty, improving food security and strengthening livelihood resilience in the face of climate change.[110] There are also several examples in sub-Saharan Africa of wetland use which can help reduce disasters and improve resilience. For example, the small-scale cultivation of in land wetlands, such as the bas fonds in West Africa or dambos in Southern Africa.[111] These play an important role in helping communities survive during the long dry season and avoid seasonal hunger. In this way disaster risks are reduced. Wetlands are also feeding towns and generating

[107]Rebelo, LM, McCartney, M.P. & Finlayson, C.M. Wetlands of Sub-Saharan Africa: distribution and contribution of agriculture to livelihoods. *Wetlands Ecol Manage* **18,** 557–572 (2010). https://doi.org/10.1007/s11273-009-9142-xv

[108]Rebelo, LM. McCartney, M.P. & Finlayson, C.M. Wetlands of Sub-Saharan Africa: distribution and contribution of agriculture to livelihoods. *Wetlands Ecol Manage* **18,** 557–572 (2010). https://doi.org/10.1007/s11273-009-9142-x

[109]Ibid

[110]Wood A. Valuing wetlands for livelihoods as the basis for sustainable management 2009

[111]Mati, B. M. (2011). Optimizing agricultural water management for the green revolution in Africa. In *Innovations as Key to the Green Revolution in Africa* (pp. 83-94). Springer, Dordrecht.

income, as well as savings, for farmers.[112] However, on centrally as for the case of Uganda much as wetlands in Kampala have been turned into agrarian centres there is still an element of poverty, food insecurity and low-income earners among others so if wetlands are encroached elsewhere solve the above challenges, what reasons are put in place to support the idea of agrarian activities on wetlands in Kampala District?

From the context of Namara's inferences, agrarian activities have always been part of Uganda's economy and an important livelihood strategy for the city's urban poor and the only place is the wetlands.[113]Traced majorly in the early 1970s, urban agrarian in Kampala provides food base for over 35% of the city's population either practicing agrarian activities in wetlands or buying food directly from them.[114]

Accounts by Hooton indicate that the period in which agricultural activities worsened encroachment on wetlands in Kampala in the 1970 and 1980s was attributed to the political turmoil. The period was characterized by political turmoil and concomitant economic crisis.[115]Besides the political turmoil, the city was faced by urban population growth which remained on course that during the period of 1970-1980; the population of Kampala grew at an average 3.14% per annum.[116]The growth in urban population had implications of unemployment, culminating into urban poverty that the urban poor population devised means of survival through

[112]De Zeeuw, H., & Dubbeling, M. (2009). Cities, food and agriculture: challenges and the way forward. *RUAF Foundation, Leusden*.
[113]Namara, H. (2011). *The impacts of urbanization on the agricultural land use: a case study of kawempe division, Kampala Uganda* (Master's thesis, University of Agder).
[114]Zezza, A., & Tasciotti, L.(2010). Urban agriculture, poverty, and food security: Empirical evidence from a sample of developing countries. *Food policy*, *35*(4), 265-273.
[115]Hooton, N. (2007). *Championing Urban Farmers in Kampala: Influences on Local Policy Change in Uganda: Process and Partnership for Pro-poor Policy Change* (Vol. 2). ILRI (aka ILCA and ILRAD).
[116]Ibid

engaging in various activities, mainly agriculture in wetlands.[117] However much the above challenges are given as justifications of wetland encroachment in Kampala district, none of the above has been dealt with and this suggests that there could other reasons as to why wetlands in Kampala have been turned into agrarian centres.

Also until 2005, it had been illegal to carry out agrarian activities in the wetlands. Before 1990s, there were few activities to support urban agriculture but after de-centralization in 1993, Kampala district agrarian officer started building capacity for urban agricultural work, mainly through collaboration with Non-government organization such as Environmental Alert.[118] By 1999, despite the involvement of many people within Kampala capital city still regarded urban wetland agrarian as illegal, there was more open collaboration between Kampala capital city and Non-government organizations to control cases of encroachment on wetlands for agrarian purposes in order to control the would be challenges of wetland extinction in Kampala

District.[119]

1.8.3 The Impact of Agrarian Evolution on Wetlands

Agriculture in and around wetlands can lead to conflicts between farmers and other wetland users and in Kampala, these would be those dealing in bricks, craft making and others.[120] The most frequent impact of the development of wetland agriculture is losses in subsistence agriculture,

[117]Eduardo Lopez Moreno. From Structural Adjustment Programs to poverty reduction strategies, UN Habitant 2001
[118]Wandera, P. (2014). *The political ecology of unplanned land use changes in Kampala City, Uganda: a case of selected parishes of Kawempe Division* (Master's thesis, NTNU).
[119]Wandera, P. (2014). *The political ecology of unplanned land use changes in Kampala City, Uganda: a case of selected parishes of Kawempe Division* (Master's thesis, NTNU).
[120]Kosgei, J. R., Nasongo, S. A., Kipkemboi, J., & Owuor-Okeyo, J. B.(2021). Land and Water Resources Planning and Management Options in Floodplain Wetlands in Nyando Basin, Kenya. *Journal of Environmental Protection*, *12*(12), 1144-1160.

which are offset by gains in market-oriented agriculture, where the latter is often associated with a mono-culture and intensive.[121]Hence, agriculture intensification in wetlands results in groups of people reliant on subsistence agriculture is losing out, with a negative feedback cycle occurring where productivity losses lead further expansion and transformation of wetlands.[122]

Although wetland agriculture can bring significant benefits in terms of food security, health, and income, ill-considered development often results into wetland de-gradation, deleterious environmental impact and harmful consequences to people's livelihood.[123] Policies in agriculture sector have been some of the key drivers of change in wetlands in many parts of the world. Cleaning and draining wetlands for agricultural expansion have been the primary cause of agriculture de-gradation in the past and present. Pollution from the use of fertilisers and pesticides has adversely impacted nature and under-mined ecological character of many wetlands. That is why today agriculture remains the greatest threat to natural wetlands .The loss of eco-system services arising because of de-gradation of wetlands can have a devastating consequence for the people often the poorest who depend on them .For example the construction of the Bakolori dam in Sokoto river a tributary of Niger to supply irrigation water resulted in decreased downstream wetland inundation.[124]These results are similar to the findings of other studies focused on African wetlands which have found a wide range in household income generated from wetland crops.

[121]Rietveld, A. M., Groot, J. C., & van der Burg, M. (2022). Predictable patterns of unsustainable intensification. *International Journal of Agricultural Sustainability*, *20*(4), 461-477.
[122]McCartney, M., Rebelo, L. M., Senaratna Sellamuttu, S., & De Silva, S. (2010). *Wetlands, agriculture and poverty reduction* (Vol. 137). Iwmi.
[123]Asongwe, G. A., Yerima, B. P., Tening, A. S., & Mbomi, E. S. (2017). Food security and environmental implications of urban wetlands utilisation as vegetable gardens: the case of Bamenda municipality Cameroon. *Journal of Agriculture and Ecology Research International*, 1-12.
[124]LIoyd C.(2010).The role of wetlands in global cycle. Report to scientific and Technical Review Panel

In Uganda, wetlands have been drained to enlarge the area of farm land. However, drainage of wetlands causes loss of valuable water which would otherwise be available for plant growth, floods and drought damage, water pollution, nutrient run-off and decline in wildlife population.[125]

Agrarian activities seek to increase yields and to reduce costs. Yield increases with inputs such as fertilizers and removal of pathogens, predators, and competitors (such as weeds). Costs decrease with increasing scale of farm units, such as making fields larger; this means removing hedges, ditches and other areas of habitat. Pesticides kill insects, plants and fungi. These and other measures have cut bio-diversity to very low levels on intensively farmed land.

In 2010, the International Resource Panel of the United Nations Environment Programme assessed the environmental impact of consumption and production. It found out that agrarian and food consumption are two of the most important drivers of environmental pressures, particularly habitat change, climate change, water use and toxic emissions. Agrarian is the main source of toxins released into the environment, including insecticides, especially those used on cotton.[126] The 2011 United Nations Environment Programme Green Economy report states that agrarian operations, excluding land use changes, produce approximately 13 per cent of anthropogenic global greenhouse gas emissions. This includes greenhouse gas emitted by the use of inorganic fertilizers, agro-chemical pesticides, herbicide and fossil fuel-energy inputs.[127]The above leads to deleterious

[125]Ibid

[126]International Resource Panel(2010). "Priority products and materials: assessing the environmental impacts of consumption and production". United Nations Environment Programme
[127]UNEP, 2011, Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, https://www.unenvironment.org/search/node

impact on human beings and the environment at large.[128]Therefore, the current study sought to document the impact of agrarian evolution on wetlands in the case of Kampala district.[129]

1.9. Research Methodology

The study deployed a historical research design that sought understanding of historical events that characterised the evolution of agrarian practises on wetlands in Kampala district.[130]The research adopted qualitative approach relying mainly on documentary review and oral interviews from key informants and residents around wetlands in Kampala.[131]The documentary review depended on the analysis of existing literature, laws and policies focusing on wetlands in Kampala district.[132] Scores of written materials were also used to gather official information and these included articles, journals, newspapers, periodicals, among others to give a theoretical stature of this research.[133]

Data was collected in form of themes, statements and words. This was done in a narrative form on the different interview questions where the researcher organized statements and responses from different respondents as indicated above generated useful conclusions and interpretations on the research objectives.[134]

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[128]International Resource Panel (2010). "Priority products and materials: assessing the environmental impacts of consumption and production". United Nations Environment Programme

[129] Ibid

[130]Danto, E. A. (2008). *Historical research*. Oxford University Press.

[131]Vishnevsky, T., & Beanlands, H.(2004).Qualitative research. *Nephrology Nursing Journal, 31*(2), 234

[132]Bachiochi, P. D., & Weiner, S. P.(2004). Qualitative data collection and analysis. *Handbook of research methods in industrial and organizational psychology*, 161-183.

[133]Elmendorf, W. F., & Luloff, A. E.(2001).Using qualitative data collection methods when planning for community forests. *Journal of Arboriculture, 27*(3), 139-151.

[134]Ibid

1.9.1 Study Population

The study population section indicated the target population of the study and how it was selected to be involved in the study.[135]The study population in this case were the people living around the wetland areas in Kampala and the officers in the line ministries, departments and agencies who could give a clear account on the genesis of agrarian evolution on wetlands in Kampala district from 1900-2010. Therefore, the study population involved people who had wealth of knowledge on wetlands in Kampala. Among these, were people participating in agrarian activities in these wetlands, the elderly of 50years and above because these are deemed to be key informants who can give an account to the agrarian evolution on wetlands given the years they have lived and accumulated knowledge, the National Environmental Authority, National Forestry Authority, Kampala Capital City Authority, among others. These were selected because of their legal mandate in policy formulation and implementation regarding the protection, management and use of wetlands in Uganda.

1.9.2 Sampling Techniques

The study deployed a purposive sampling technique to select the participants.

Purposive Sampling

The above sampling technique was deployed to select respondents who included; the people who were participating in agrarian activities in wetlands, and the elderly people of 50 years and above because they had information about agrarian evolution. Besides, National Environment

[135]Zhao, L., Tian, L., Cai, T., Claggett, B., & Wei, L. J.(2013). Effectively selecting a target population for a future comparative study. *Journal of the American Statistical Association*, *108*(502), 527-539.

Management Authority officials who were also rich in information about agrarian evolution on wetlands in Kampala district were engaged, Kampala Capital City Authority officials mainly those in the office of the environment, National Forestry Authority officials mainly those in office of natural resources.[136]The advantage of using purposive sampling is that, since it involves all members within the population of interest, it is possible to get deep insights into the phenomenon the researcher is interested in.[137] Therefore, the researcher selected participants basing on their offices and responsibilities or experience by age came along with the information that the study required. The study had targeted a sample size of 50 participants but with the guidance of Mason's principle of saturation point, the study engaged 30 participants and realised that collection of more data was not contributing to new information but a repetition of what had already been said.[138]

1.9.4. Data Collection Methods

In-depth Interview

The researcher used an interview guide as the instrument which allowed an in-depth interview of the key informants on issues related to agrarian evolution on wetlands in Kampala district. In-depth interviews were used to collect data from the community members engaged in agrarian practices in the wetlands under study as well as the elderly living near these wetlands and are 50 years and above. Interviews enabled the interviewer to observe, discuss and listen as well as permitting complex questions to be asked. Participants gave their views on the genesis of agrarian

[136]Rai, N., & Thapa, B.(2015). A study on purposive sampling method in research. *Kathmandu: Kathmandu School of Law*, *5*.
[137]Ibid
[138]Mason, M. (2010, August). Sample size and saturation in PhD studies using qualitative interviews. In *Forum qualitative Sozialforschung/Forum: qualitative social research* (Vol. 11, No. 3).

evolution on wetlands in Kampala district, the reasons why wetlands in Kampala have evolved into agrarian centres and the impact of agrarian evolution on Kampala wetlands.

Key Informant Interviews

Key informant interviews are qualitative in-depth interviews with people who know what is going on in the community.[139] The purpose of key informant interviews is to collect information from a wide range of people including political and administrative leaders, professionals, or residents who have first-hand knowledge about the community.[140] In this study, key informant interviews were used to collect data from the political leaders in the wetland areas of Kinawataka, Lubigi and Luzira- Nakivubo as well as the government officers responsible for wetland protection and management.[141]This is because these officers hold offices and responsibilities that position them with the required information for the study.

Archives

These were one of the main sources of data for this study. The study used National Environment Management Authority Archives, Buganda Kingdom achieves in Mengo as well as National archives in Wandegeya. In these achieves, land tenure systems, management and wetland encroachment reports were consulted.[142]The information obtained inarchives helped in providing background information on the geography and history of wetlands in Kampala, genesis of agrarian

[139]Kumar, K. (1989). *Conducting key informant interviews in developing countries* (pp. 1-40). Washington DC: Agency for International Development.
[140]Ibid
[141]Gilchrist, V. J. (1992). Key informant interviews.

[142]Shultz, K. S., Hoffman, C. C.,& Reiter-Palmon, R.(2005). Using archival data for IO research: Advantages, pitfalls, sources, and examples.*The Industrial-Organizational Psychologist*, *42*(3), 31.

evolution on Kampala wetlands, the reasons why wetlands in Kampala have evolved into agrarian centres and the impact of agrarian evolution on Kampala wetlands.

1.9.5 Data Collection Procedure

The researcher obtained an introductory letter from Kyambogo University, department of History Archaeology and Heritage studies to permit him conduct the study. The letter was presented to the people who had information about agrarian evolution on wetlands in Kampala for authorization and acceptance to under-take the research in Kampala district. After getting the authorization, the researcher piloted the instruments with the help of trained research assistants. The results from the pilot study were compiled and analysed to up-date the data collection tools to assure clarity of questions asked and probe into areas where findings were not consistent with the study objectives. When instruments were up-dated, the researcher proceeded to the respondents to collect data. The data was sorted, analysed and a report was written.

1.9.6 Data Analysis

Qualitative data analysis was used to present the findings from the oral interviews administered to the study population of the district. Through thematic analysis, a researcher followed Braun and Clarke's six steps of analysing data which included: Familiarising with the topic, generating similar codes, indentifying possible themes, defining themes, naming themes and writing a report.[143] The researcher presented them in a narrative form. Appropriate, verbatim quotations from the respondents have been used. Qualitative data from interviews was validated by findings from secondary sources such as archives and documentary reviews.

[143]Braun, V., & Clarke, V.(2019). Reflecting on reflexive thematic analysis. *Qualitative research in sport, exercise and health*, *11*(4), 589-597.

1.9.7 Ethical Considerations

The researcher introduced himself to the concerned authorities before data collection using an introductory letter from Kyambogo University signed by Head of Department for History Archaeology and Heritage. The researcher also explained the nature and purpose of the study as being academic and that there were no likely risks to the concerned parties. Consent of respondents was sought prior to application of interview schedule and were also informed of their rights to either participate or refrain from participation and that they would withdraw their participation at any level without justification.[144]The researcher emphasized confidentiality for all study findings. Participants were assured that their raw data would not be shared with any third party without their consent. The researcher also considered anonymity where no name, face, telephone number of the respondents was captured even when interviews were recorded; data was treated in general terms as findings but not linking the findings to individual participants.

[144]Creswell, J. W. Research Design: Qualitative, Quantitative and Mixed Methods, Approaches: University of Nebraska – Lincoln: Sage Publishers, 2009 pp. 132.

CHAPTER TWO

2.0. GEOGRAPHY AND HISTORY OF WETLANDS IN KAMPALA DISTRICT

This chapter presents the geography and history of wetland settlement in Kampala district. This background provides the elements of geography such as topography, climate and drainage of the area of study. The chapter also gives a history of wetlands in Kampala so as to trace when agriculture was introduced. Whereas this was not the main focus of this study, one needs to understand the geography of these areas so as to properly show how some of these elements have influenced agrarian evolution. This is important as it will enable us to analyse the changes and contributions in these wetlands.

2.1 The Geography of Wetland Settlement

Before interrogating the historical aspects of the biggest threat to wetland eco-systems in Kampala which is posed by increasing and dimensionless anthropogenic activities mainly agrarian, the topographic and climatic elements of Kampala were clearly highlighted below as the best way to have a clear picture of the geographical space being historicized.

2.1.1 Topography of Kampala

Kampala is the largest and capital city of Uganda divided into five boroughs of Kampala Central Division, Kawempe Division, Makindye Division, Nakawa Division and Rubaga Division. Kampala is among the fastest growing cities in Africa with annual population of 4.03%.[1] Kampala, originally referred to the only present-day Kampala hill on whose summit Fort Lugard was located and the initial headquarters of the British colonial authority in the soon to be Uganda protectorate.

[1]*Kinobe, J. R., Niwagaba, C. B.,Gebresenbet, G., Komakech, A. J., &Vinnerås, B. (2015). Mappingout the solid waste generation and collection models: The case of Kampala City. Journal of the Air & Waste Management Association, 65(2), 197-205*

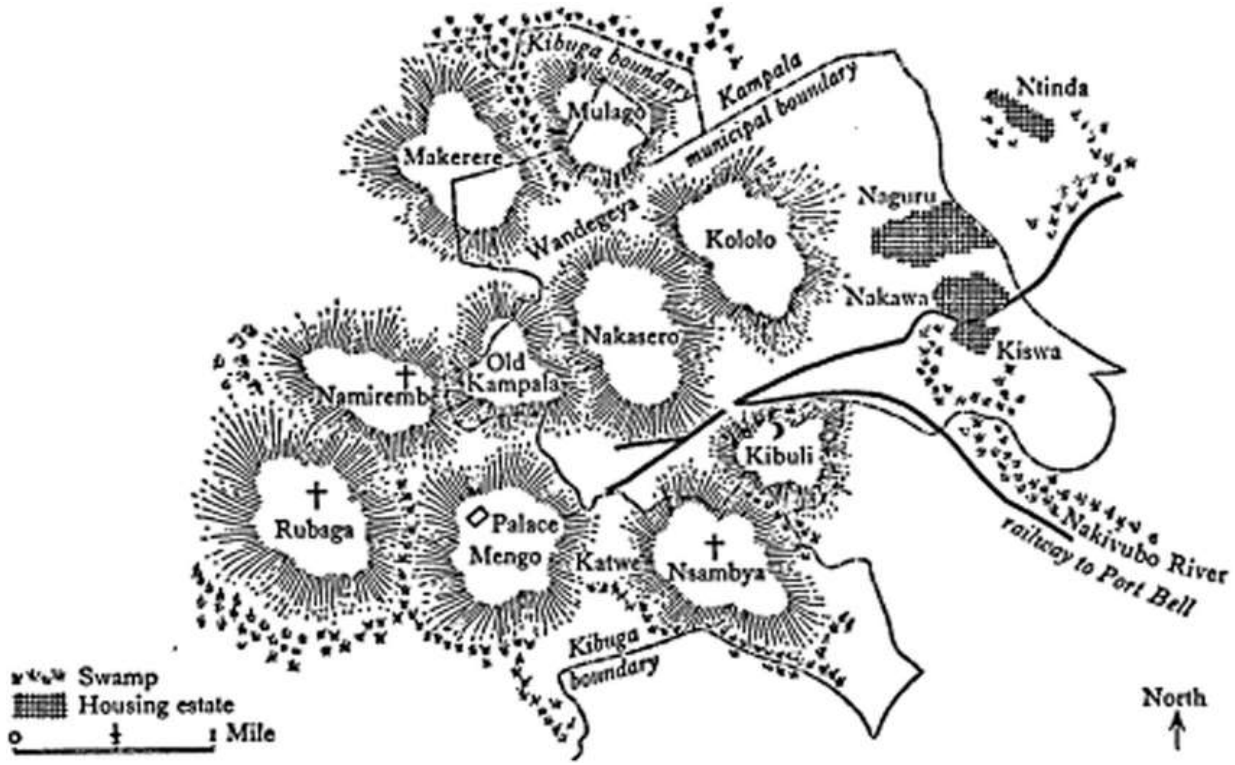
Before the British constructed Fort Lugard, the hill was a hunting reserve of the Kabaka (king) of Buganda and had several species of antelope, especially the impala in Luganda (one of the dialects spoken in Uganda).[2] As a result, when the British colonial officials were allocated this hill by the then Kabaka of Buganda, they referred to it as the hill of impala.[3]Baganda, in whose territory this British settlement was located then translated it as *akasozikeEmpala* this was shortened as *KeEmpala* and then finally became Kampala.[4] The city of Kampala covers a total area of 189km^2 comprising of 176km^2 of land 13km^2 of water mainly wetlands[5]. Kampala is a hilly place with its valleys filled with sluggish streams/swamps. The highest peak in the city proper is Kololo hill at 1,311meters located in the centre of the city and the lowest point at the showers of Lake Victoria south of the city centre at the altitude of 1,135meters. Kampala was originally built on seven hills but it has expanded to cover more than the original seven hills.[6]

These included The Old Kampala hill on which Fort Lugard was located and the first seat of the British colonial authority in colonial Uganda, the second is Mengo hill which was the then(kibuga) the capital of Buganda Kingdom at the start of colonial rule, the third is Kibuli hill which was the home of Kibuli mosque, the fourth is Namirembe hill which was the home of Anglican faction of Buganda ,the fifth is Lubaga hill which is the home of white fathers Catholic, the sixth hill is Nsambya hill of the Cathedral Saint Peters Nsambya and allocated to the British Catholic Mill hill,

[2]*Omolo-Okalebo,F.(2011). The Evolution of Town Planning Ideas, Plans and their Implementation in Kampala City 1903-2004. (Doctoral dissertation, KTH Royal Institute of Technology).*
[3]*Munger, E. S. (1951). Relational patterns of Kampala, Uganda. University of Chicago.*
[4]*Monteith,W.(2019). Markets and monarchs: indigenous urbanism in postcolonial Kampala. Settler Colonial Studies, 9(2), 247-265.*
[5]*Ibid.Pg 247-265*
[6]*Aryampa, S.,Maheshwari,B., Sabiiti, E., Bateganya, N. L., & Bukenya, B. (2019). Status of waste management in the East African Cities: Understanding the drivers of waste generation, collection and disposal and their impacts on Kampala City's sustainability. Sustainability, 11(19), 5523.*

the seventh hill is Nakasero hill on whose summit was Fort Nakasero,British military installation built after re-locating from Fort Lugard to Old Kampala.[7]

Figure 1: An illustration that shows the seven hills on which Kampala was built.



Source: KCCA, (2012)

Due to the hilly nature of Kampala and her tropical climate the valleys have wetlands that tend to flow southward towards Lake Victoria. These seasonal and permanent wetlands cover 15% of Kampala wetland areas.[8]These include Kinawataka wetland covering 1.5km^2 (0.58squre miles) flowing southwards into Lake Victoria located in Nakawa Division, Nakivubo wetland covering

[7]*Kibirige D (2006*). The *Hills of Kampala and their* history. Tour *guide publications, Kampala, Uganda*
[8]*KCCA, (2012). Kampala Physical Development Plan; Updating Kampala Structure Plan and Upgrading Kampala GIS, Draft Final Plan*

5.29km^2(2.04square miles) flowing southwards to Lake Victoria from the foothills of Makerere, Lubigi wetland covering an area of 2.85km (1.10square miles) flowing westwards from foothills of Kisasi into Majanga river among others. Due to its location and city stature, Kampala has experienced decades of significant urban growth and is currently the fastest growing city in East Africa.[9] As Uganda's capital, Kampala is the industrial, commercial and education centre vital for country's economic development. Kampala is entirely developed with less than 10% of land mass vacant of which 7% of the area is wetlands. As a consequence of rapid urbanisation and increasing population, there is a lucid challenge of land for settlement and survival in the name of food.[10]

The available information points out how Kampala has massively evolved from a place of seven hills to one of the fastest growing cities in Africa characterised by, urban population growth, industrial, commercial, among others.[11] Kampala's efforts to protect wetlands from being turned into agrarian centres have been limited.[12] There is no clear plan in strategic manner for wetland conservation, land tenure system, urban services, and urban settlement among others.

Kampala, being the commercial and industrial centre in Uganda, is the centre piece of Uganda's economic, political and social transformation. Its vibrant economy acts as catapult for settlement for many people from other areas of the country with some settling in wetlands where they engage in agricultural activities.[13]Kampala's 2023 population is now estimated at 7,003,977of which 35%

[9]*Nyakaana, J. B., H. Sengendo, etal.(2004) Urban Development, Population and the Environment in Uganda: The Case of Kampala City and its Environs.*
[10]*UPPAP. (2000*). Uganda *Physical Planning Action* Plan. Ministry *of Housing and Urban.*
[11]*Maitima, J. M., Rakotoarisoa, M. A., & Kang'ethe, E. K. (2010). Responding to changing markets in a context of increased competition for resources. Livestock in a Changing Landscape: Experiences and Regional Perspectives, 2, 4*
[12]*Alegi, P. (2010). African soccerscapes: How a continent changed the world's game. Ohio University Press.*
[13]*Smardon, R.(2014). Sustaining the World's Wetlands. Springer.*

of this population survives on urban wetland cultivation growing yams and vegetables.[14] It ought to be noted that almost one sixth of Kampala, or 31 km^2, is covered by wetlands in which residents conduct livestock and crop production.[15] Despite the designation of most of the city's wetlands as "green corridors" in the 1994 Kampala Structural Plan, many have been zoned for urban expansion and development and have either been converted to industrial uses or have gradually been taken over by agrarian activities and settlement.[16] Today, it is estimated that about three quarters of the city's wetlands have been affected by human activities to a significant level, and up to 14% are seriously being converted to agrarian centres.

The current trend points to one fact that Kampala's wetlands are rapidly being reclaimed and converted completely into crop production spaces.[17] With increased urban population in Kampala, there has been a growing demand for land for housing, settlement, and agrarian purposes to which many of the urban dwellers are resorting to wetlands for not only settlement but also conducting agrarian activities.[18]

For purposes of this study, the focus was on historicizing the agrarian activities that have encroached on the three largest wetlands of Kampala District influenced by the topography of this area. These are, Kinawataka, Luzira and Lubigi. Kinawataka wetland is located in Nakawa sub-

[14]*KCCA,(2012*). Kampala *Physical Development Plan; Updating Kampala Structure Plan and Upgrading Kampala GIS, Draft Final Plan.*
[15]*Dennis, K., & Andrew, M.(2005). The Effects of Wetland Degradation on the* Socio-Economic *Welfare A case study of Nabisasiro Wetland in Rubaga division.*
[16]*Sabiiti, E. N., Katongole, C. B., Katuromunda, S., Sengendo, H., Basalirwa, C. P. K., Atukunda, G., &Nambuubi, S. K. (2014). Building Urban Resilience: Assessing Urban and Peri-urban Agriculture in Kampala,* Uganda. [*Padgham, J. and J. Jabbour.*
[17]*National Wetland Programme (NWP, 2000*).Managing *wetlands with changing times, Uganda's* experience. Makerere *Institute of Social Research. Kampala, Uganda*
[18]*Doherty, J. (2019). Filthy flourishing: para-sites, animal infrastructure, and the waste frontier in Kampala. Current Anthropology, 60(S20), S321-S332.*

county 6 .5km East of the city centre, Lubigi which covers part of Rubaga and Kawempe, 7.5km West of Kampala centre and Luzira which is located in Nakawa Division Eastern part of Kampala.[19] These are the mostly encroached on wetlands in Kampala by agrarian activities as a way of securing livelihood.[20]

2.1.0 Location of Area of Study

The wetland areas under investigation are geographically located within different areas of Kampala. These include the areas of Kinawataka, located next to Nakawa in Kampala District, areas of Lubigi, located in the north-western part of Kampala along Northern by-pass and Kampala Hoima road. Besides, the other areas are those of Luzira, located approximately 10 kilometres, by road, south-east of the central business District of Kampala.[21]

2.1.1. Kinawataka Wetland

Kinawataka wetland is located 5 km from the eastern region of Kampala City along Jinja road lying between the geographical co-ordinates of latitude 0020'00"N to 0 in Nakawa Division.[22] It is also called Kinawataka - Bukasa wetland and it is the second major wetland after Nakivubo wetland, with dense vegetation thickets and riverine trees.[23] This wetland is dominated by papyrus downstream, with patches of Phragmites, Typhasp, Echinochloasp and Afromomumsp. This wetland serves to protect the inner Murchison, Mbuya, Nakawa, Ntinda, Kyambogo, Banda,

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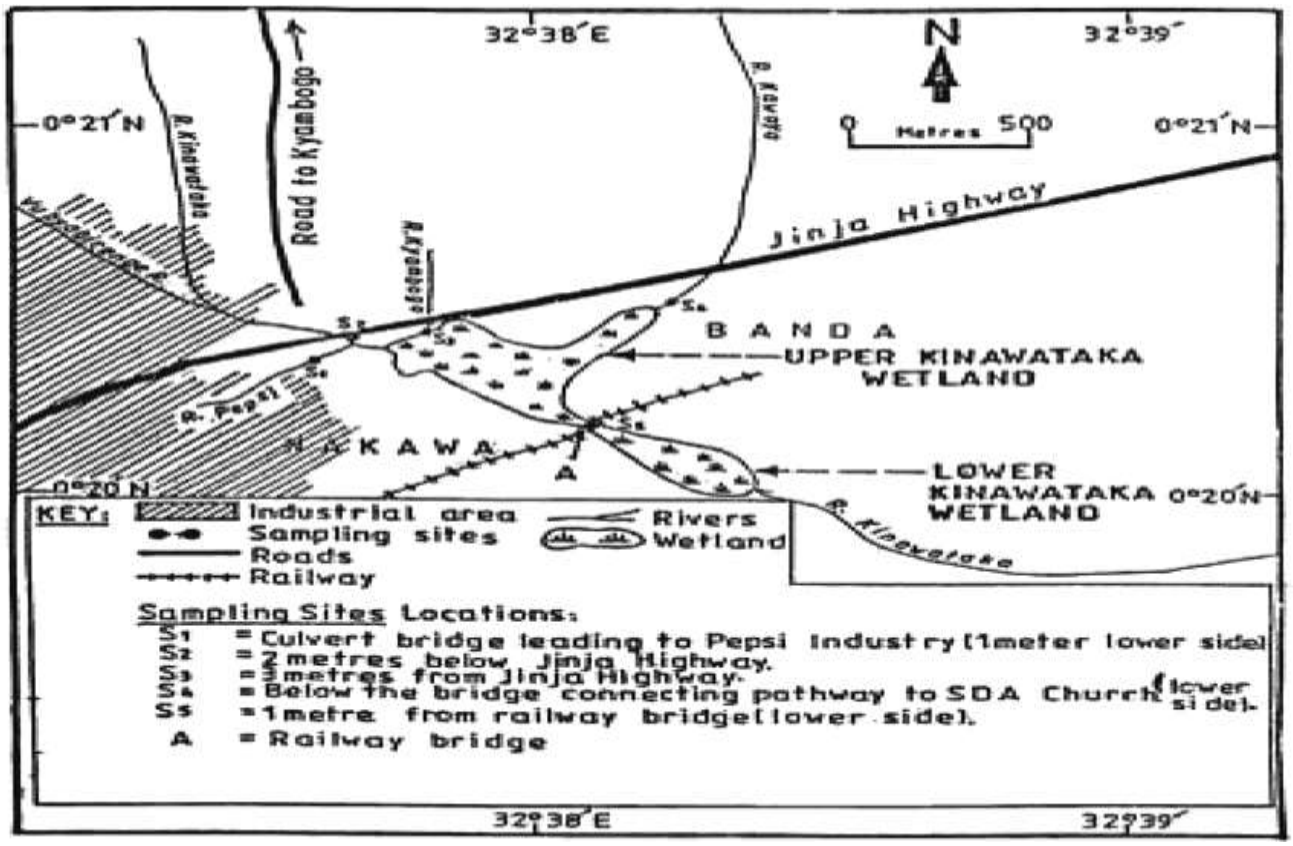
[19]*Turyahabwe, N., Tumusiime, D. M., Kakuru, W., & Barasa, B. (2013). Wetland use/cover changes and local perceptions in Uganda. Sustainable Agriculture Research, 2(526-2016-37853).*
[20]*Namaalwa, S., Funk, A., Ajie, G. S., & Kaggwa, R. C.(2013). A characterization of the drivers, pressures, ecosystem functions and services of Namatala wetland, Uganda. Environmental Science & Policy, 34, 44-57.*
[21]Gumm, Emily. "The use and misuse of wetlands in Kampala." (2011).
[22]*Koojo, Charles Amooti, etal.(2005) Implementation of Physical Plans with Reference to Wetland Land Use in Kampala City,* Uganda. Makerere *University*

[23] Ibid

Kireka, Bweyogerere, Kirinya and Butabika. Below is a geographical sketch map of Kinawataka wetland in Kampala district.[24]

Figure 3: Sketch Map of Kinawataka Wetland in Kampala



Source: Adopted from Kakuba and Kanyamurwa, (2021).

The wetland areas of Kinawataka catchments are heavily agrarian following the dense population rendering them vulnerable to the release of nutrient rich effluents which are potential pollutants to Lake Victoria.[25]There are also indicators of agro-industrial evolution, general pollution among

[24]*Kakuba, S. J., &Kanyamurwa, J. M.(2021).Management of wetlands and livelihood opportunities in Kinawataka wetland, Kampala-Uganda. Environmental challenges, 2, 100021.*
[25] Tumuheire, A. (2017). Impact of land use changes and wetland degradation on water: Case of Upper Kinawataka wetland, Kampala-Uganda.

others but forgetting the reality that primary agrarian activities are part of the leading severe activities consuming Kinawataka wetland probably to extinction. Agriculture is a very important activity in Kinawataka wetland because it sustains the dense population especially those who cannot afford to buy daily food for survival.[26]

As a result of agrarian practices that have become extensive, Kinawataka wetland has decreased by 46% and its degradation rose from 49% to 95% from 1992 to the present due to agrarian activities and settlement. These human agrarian activities have destroyed Kinawataka wetland coverage from 96.3% of the total wetland land coverage to 82.5% in 2015.[27]

On this background therefore, there is perhaps no comparable wetland in Uganda that has faced drastic changes attributed to mismanagement, diminishing potential to provide maintainable livelihood prospects as Kinawataka wetland.

However, Kinawataka stands out significantly as one of the Kampala city's wetlands with the potential to provide livelihood opportunities for the nearby communities and beyond. Prominent among the features of the study site were housing construction sites, agricultural activities, clay extraction locations, car washing bays, garbage dumping and motor-car garages. As key indicators of the challenges in the current public management mechanisms, these wetland activities combine to critically threaten Kinawataka's potential for resource sustainability.[28] The activities mostly undermined the wetland's capacity to control flooding, potential support for controlled agriculture, water purification and employment opportunities.

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[26]*New Vision, (2014) September 5 2014. Dry Zones in Greater Kampala to get water soon*
[27]*Lwasa, S.(2010).Adapting urban areas in Africa to climate change: the case of Kampala. Current Opinion in Environmental Sustainability, 2(3), 166-171.*
[28]*Markandya, A., Cabot-Venton, C., & Beucher, O. (2015). Economic assessment of the impacts of climate change in Ugand*

2.1.2. Lubigi Wetland

Lubigi wetland forms an irregular semi-circle around the city of Kampala, starting at around Kisaasi to the north, stretching west-wards, passing through Bwaise and Kawaala, then stretching southwards through Busega.[29] The swamp has feeder arms that stretch along the Kampala–Mityana road towards Buloba, along Kampala –Masaka road towards Kyengera, along Kampala–Hoima road towards Nansana and along Sentema road that stretches from Mengo to Sentema. The Kampala Northern by-pass Highway is built in the wetland for more than half of its length. The Bwaise slum is entirely built within the Lubigi wetland. The geographical co-ordinates of Lubigi wetland are: 0°19'12.0"N, 32°31'12.0"E (Latitude: 0°19'12.0"N; Longitude: 32°31'12.0"E).[30]

To the north, around Kisaasi and Ntinda the wetland connects with the tributaries of Nakivubo channel, another wetland that drains into Lake Victoria, south-west of Port Bell. To the south, around Busega, some of the water in the wetland drains south-east into Lake Victoria, while the rest flows north-west, along the Kampala–Mityana road towards Buloba. West of Buloba, the flow turns northwards as a tributary of the river Mayanja, which forms part of Lake Kyoga drainage .This wetland is also dominated by papyrus downstream, with patches of Phragmites, Typhasp, Echinochloasp and Afromomums. Below is a geographical illustration of Lubigi Wetland in Kampala district.[31]

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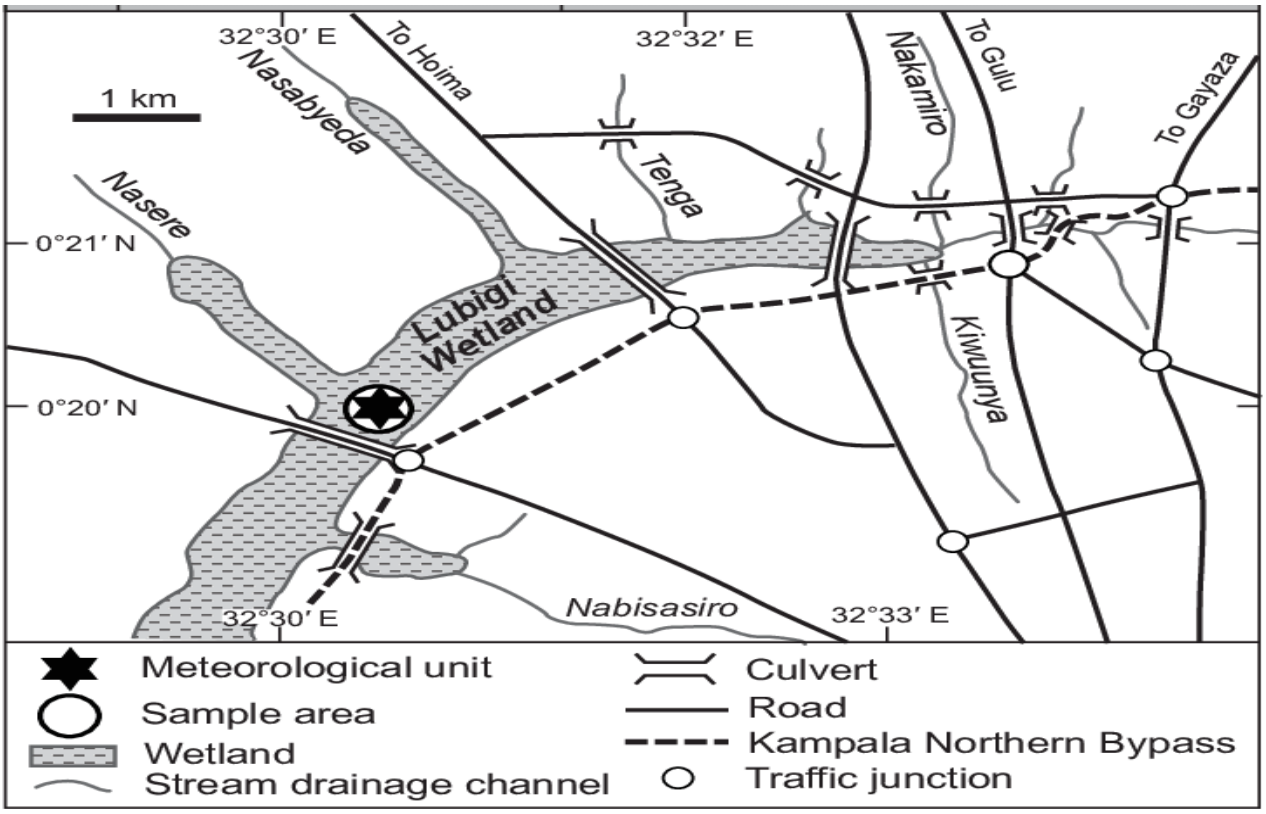
[29]*Lwasa,S. (2010).Adapting urban areas in Africa to climate change: the case of Kampala. Current Opinion in Environmental Sustainability, 2(3), 166-171.*

[30]*Carmin, J., Anguelovski, I., & Roberts, D.(2012).Urban climate adaptation in the global south: planning in an emerging policy domain. Journal of planning education and research, 32(1),18-32.*

[31]*Richmond, A., Myers, I., & Namuli, H (2018).Urban informality and vulnerability: A case study in Kampala, Uganda. Urban science, 2(1),22.*

Figure 4: Sketch Map of Lubigi wetland



Source: Adopted from Kayima, Mayo, etal(2018).

Lubigi wetland is a very important water catchment area, serving the city of Kampala and the surrounding areas of the district. Small scale farmers are taking advantage of the fertile lands in Lubigi as they say that Lubigi wetland is good for farming, business and cheap to live in. This has greatly reduced its original size.[32] The loss and degradation of Lubigi is attributed to illegal agrarian activities. However, the local people who live in Lubigi say that they have limited access to capital to purchase land and this has forced them to settle in Lubigi wetland to the extent that

[32]*Omolo-Okalebo,F.(2011). The Evolution of Town Planning Ideas, Plans and their Implementation in Kampala City 1903-2004 (Doctoral dissertation, KTH Royal Institute of Technology).*

others have even obtained land titles in this wetland.[33] Agrarian activities in Lubigi wetland have continued without action from local and central government hence putting Lubigi swamp at the front line for extinction.[34]The portion of the wetland along the western most section of the bypass has a high level species richness and overall function while areas of the wetland towards northern section of the by-pass are being degraded by agrarian activities such as yam growing, unearthing grass for livestock and mulching, maize planting and small scale rice growing in some parts of Lubigi wetland.[35] Although such agrarian activities take place in Lubigi wetland, they receive less attention from authorities and scholars as much attention is put on this waste treatment facility as the leading factor for the loss of Lubigi wetland which prompted this study to under-take this scope.

2.1.3. Luzira-Nakivubo Wetland.

This is one of the most dominant wetlands of urban area and one of the major wetlands in Kampala located on the northern shores of Lake Victoria.[36] The geographical co-ordinates of this wetland are between latitudes 00° 17′ and 00° 19′ N and longitudes 32°37′ and 32°39′ E, at an altitude of 1,135 metres above sea level, in close proximity of Kampala City.[37]The wetland is only 4 km away from the in-take of the city's water supply.[38] Though it is part of a network of wetlands that drain

[33]*Ministry of Water Lands and Environment;* (MWLA*) (2000) Guidelines for compliance and monitoring of wetlands*
[34]*Kamugisha, J.R (1993). Management of Natural Resources and Environment in Uganda*
[35]*KCC (1994*). Report *of Kampala Urban study on status of wetlands and their use in Kampala*
[36]*GoU [Government of Uganda](2000).National Environment Act. Kampala, Uganda: Government of the Republic of Uganda.*
[37]*Nelson, T., David, M. T., Fred, Y., Willy, K., & Vincent, B.(2017). Awareness, perceptions and implementation of policy and legal provisions on wetlands in Uganda. African Journal of Rural Development (AFJRD), 2(1978-2017-1910), 161-174.*
[38]*Nyakaana, J. B., H. Sengendo, et al. Urban Development, Population and the Environment in Uganda: The. Case of Kampala City and its Environs.2004*

Kampala city, Luzira is the largest wetland in Kampala.[39] According to the wetland boundaries from Ministry of Water and Environment, Luzira wetland covers an area of about 5.29 km^2 and serves a catchment area of slightly over 50 km^2 of the urban neighbourhood drained by the Nakivubo channel.[40]This wetland runs from the central industrial district of Kampala, passing through dense residential and industrial settlements before entering Lake Victoria at Murchison Bay.[41]

Figure 5: Map illustrating Luzira-Nakivvubo Wetland.

[39]*Richardson, B. J. (1993). Environmental management in Uganda: the importance of property law and local government in wetlands conservation. Journal of African law, 37(2),109-143.*
[40]*Borrini, G., Jaireth, H., Farvar, M. T., Pimbert, M.,& Kothari, A. (2007). Sharing power: learning-by-doing in co-management of natural resources throughout the world. Earthscan.*

[41]*Koohafkan, P., & Altieri, M. A.(2011). Globally important agricultural heritage systems: a legacy for the future. Rome: Food and Agriculture Organization of the United Nations.*

Source: Adopted from Muwanga, (2010).

More than 100,000 people live on the fringes of Luzira wetland, including both high cost housing estates and low-cost, high-density settlements and slums Just like Kinawataka and Lubigi wetlands in Kampala.[42] Luzira wetland has been subjected to a gradual process of conversion and reclamation for agrarian purposes and settlement.[43] The wetland areas around Nakivubo and Luzira are regarded epitome for agrarian activities in Kampala as dwellers utilize them for crop

[42]*Richardson, B. J. (1993). Environmental management in Uganda: the importance of property law and local government in wetlands conservation. Journal of African law, 37(2), 109-143.*
[43]*FAO.(2007) Profitability and sustainability of urban and peri-urban agriculture. Agricultural Management, Marketing and Finance Occasional Paper. Food and Agriculture Organization of the United Nations (FAO).*

cultivation, livestock, extract papyrus and other grass for mulching and draw water for irrigation during dry seasons.[44]

It is accessible along the railway line that traverses the entire length of the wetland to Port Bell and lies within the equatorial belt with a moist sub-humid climate and has bi-annual rainy seasons; March to May and September to November.[45]Papyrus,Mischanthus,Phragmites, Typhasp, Echinochloasp, Afromomums, among others, dominate the plant species in Luzira wetland. Although the less water areas have been modified by the cultivation of yams and sugarcanes especially around Namuwongo and Bugolobi, the slum close to Namuwongo is expanding into a wetland and the wetland is being used for tertiary treatment of effluent from National Water and Sewerage Co-operation, by farmers cultivating crops and harvesting papyrus.[46] It ought to be noted that more than 50% of Luzira wetland has been utilised by agrarian practices.[47]However, the available literature talks about the growing of crops like yams, sugar-canes among others yet no literature has really highlighted the genesis of agrarian activities on this wetland. It is on such a basis that this study analyses the geography of this wetland to show the changes that have taken place and how such changes have influenced the growth of agricultural activities in this area.

2.2. Climate

Located near the equator, Kampala has little fluctuation in the average temperature throughout the year. Temperatures range from average lows to mid-60s Fahrenheitto average highs in the low

[44]*National Wetland Programme.(2000).District inventory report for Rakai.*
[45]*Dugan, P., & Dungan, P. J. (Eds.).(1990). Wetland conservation: A review of current issues and required action.*

[46]*Byakagaba, P.,Egeru, A., Barasa, B. et al. Uganda's rangeland policy: intentions, consequences and opportunities. Pastoralism 8,(2018). https://doi.org/10.1186/s13570-017-0111-3*
[47]*Aandahl, G.(2012, March).Sharing Water: Problems, conflicts and possible solutions–the case of Kampala. In Forum for Development Studies (Vol. 39, No. 1, pp. 139-146). Routledge.*

80sFahrenheit.[48] However, the tropical rain forest provides variations with two annual wet seasons.[49]There is along rain season from August to December and a short rainy season from February to June that has substantially heavier rainfall per-month and this has attracted most of the urban dwellers settling near wetlands to utilize them for agrarian practices in both livestock and crop production.[50] These agrarian practices tend to appear silent but they have an evolving impact on climate change in Kampala and their impact has been growing from 12.8% in the short term, to 16% in the medium term and in the long term, 23.9%.[51] Such figures appear to be less as compared to other factors but for an urban setting, they are a bigger threat given their evolving abilities over time as illustrated below.

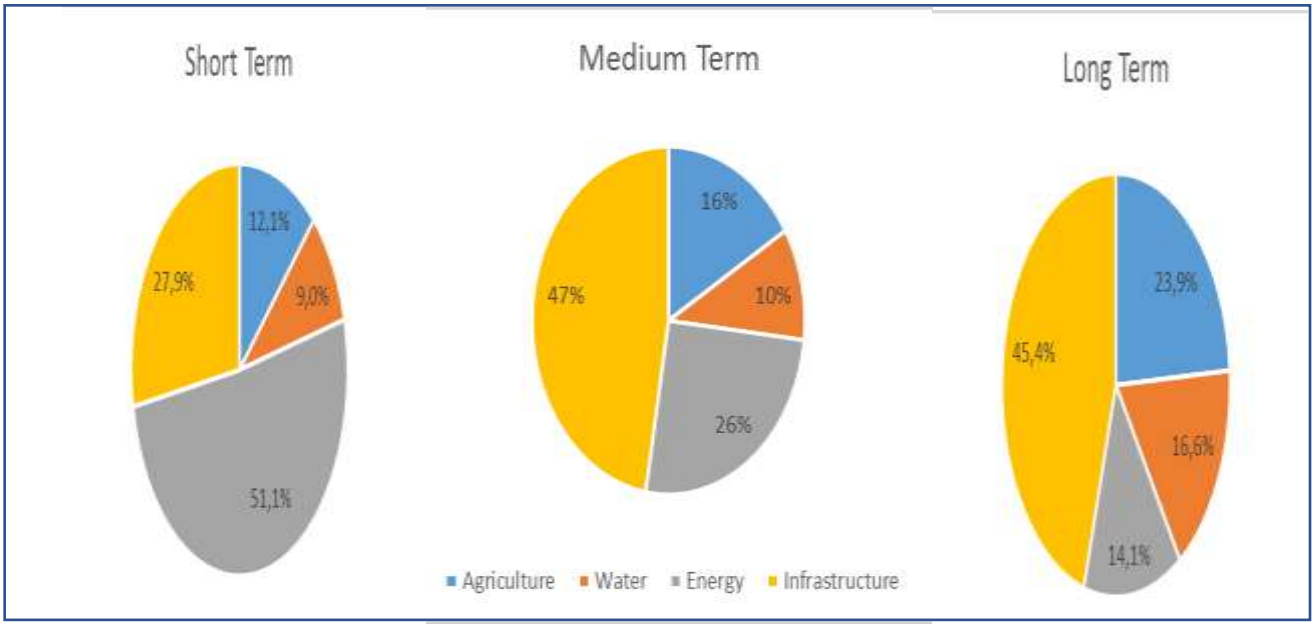
Figure 2: Sector share of the contribution to climate change in Kampala city in the short, medium and long term

[48]*Omolo-Okalebo, F.(2011). The Evolution of Town Planning Ideas, Plans and their Implementation in Kampala City 1903-2004 (Doctoral dissertation, KTH Royal Institute of Technology)*

[49]*Obaikol, E., & ALLIANCE, U. L.(2014). Draft Final Report of the Implementation of The Land Governance Assessment Framework in Uganda. World Bank Group, Washington, DC Available online at: http://sit e resources. worldbank. org/INTLGA/Resources/Uganda_Draft_Report. pdf.*

[50]*Ntambirweki, J. (1998). The evolution of policy and legislation on wetlands in Uganda. Case study prepared for the technical consultation on designing methodologies to review laws and institutions relevant to wetlands. Switzerland.*

[51]*Hoppe, K. A. (1997). Lords of the fly: colonial visions and revisions of African sleeping-sickness environments on Ugandan Lake Victoria, 1906–61. Africa, 67(1), 86-105.*



Source: Markandya, et al., (2015)

A number of agrarian activities such as irrigation, cultivation of crops like coco yams and vegetables, have significantly encroached on the papyrus and other grasses .Also, bush burning while clearing for crops and many others were found being conducted in Kampala wetlands and these contribute to climate change.[52] The agrarian activities in Luzira, Lubigi and Kinawataka were found exposing Kampala being an inland city to flooding, storm surges, water scarcity and mudslides.[53]

Although new information about climatic change specifically has been disseminated to the people of Kampala, the city's efforts to address climatic change mitigation and adaptation actions have been limited to those in infrastructural and industrial sectors neglecting those in agrarian

[52]*Chris, A.(2001). A public open space typology for Kampala, the development of form through studying traditional open space.*
[53]*Kisamba-Mugerwa, W.,& Nuwagaba, A. (1993).Comparative and multidimensional analysis of communal and private property resources (land) tenure and rural development in Uganda.*

practices.[54]Kampala city has no holistic local adaptation policy to comprehensively address climate change issues emanating from agrarian practices in wetlands and it is coupled with un serviced informal settlement, inadequate urban services, poor land tenure system, poor farming strategies which all result into wetland encroachment for agrarian exploitation.[55]

The experienced changes in climate attributed to the anthropological agrarian invasion of the wetlands in Kampala has eroded the historical numerous ecological services on which the city has survived for a century plus.[56] These include physical and biological cleansing of water, provision of food, human waste processing, and building materials among others which are slowly by slowly getting extinct.[57]

Whereas the information available show climate changes due to a number of activities in wetlands, little is said about how agriculture has evolved in Kampala wetlands. This is important in explaining each state of wetland in Kampala in relationship to agrarian practices.

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[54]*Goodfellow, T.(2013). Planning and development regulation amid rapid urban growth: Explaining divergent trajectories in Africa. Geoforum, 48, 83-93.*

[55]*J. Hartter and J. S. Ryan, "Top-Down or Bottom-Up? Decentralization, Natural Resource Management, and Usufruct Rights in the Forests and Wetlands of Western Uganda," Land Use Policy, Vol. 27, No. 3, 2010, pp. 815- 826. doi:10.1016/j.landusepol.2009.11.001 [Citation Time(s):2]*

[56]*C. Béné, E., Belal, O. M. Baba, S. Ovie, A. Raji, I. Malasha, F. Njaya, M. Andi, A. Russel and A. Neiland, "Power Struggle, Dispute and Alliance over Local Resources: Analyzing 'Democratic' Decentralization of Natural Resources through the Lenses of Africa Inland Fisheries," World Development, Vol. 37, No. 12, 2009, pp. 1935-1950. doi:10.1016/j.worlddev.2009.05.003 [Citation Time(s):2]*

[57]*J. Antonio and P. Oliveira, "Implementing Environmental Policies in Developing Countries through Decentralization: The Case of Protected Areas in Bahia, Brazil," World Development, Vol. 30, No. 10, 2002, pp. 1713- 1736. doi:10.1016/S0305-750X(02)00067-0 [Citation Time(s):2]*

2.3. Soils

In Kampala, acrid Ferralsols are the most prevalent soil types due to their low Cation Exchange Capacity (CEC) and Potential Hydrogen (PH). The soil of Kampala is largely badly eroded and deficient in minerals including phosphorus, magnesium, sulphur, and calcium because of being highly weathered.[58]Furthermore, Uganda has been noted as one of the nations with very high nutrient mining rates. Nutrient mining in Uganda results from the continuous transportation of direct farm harvests from rural farms to urban centres like Kampala. Nutrient loss from Ugandan soils amounts to 87 kilograms of nutrients of nitrogen, phosphorous and potassium (NPK) per hectare per year; in ratios of 38 kilograms of nitrogen; 17 kilograms of phosphorus; and 32 kilograms of potassium.[59]Soil producing elements such as climate, parent material, creatures (including human activities), geography, and time all have a role in determining how variable the soil is.[60] The majority of Kampala's tropical soils have suffered severe weathering, and the resulting soil qualities are largely influenced by the parent material and human activity, particularly in agricultural settings.[61]Given the mounting evidence of severe soil deterioration owing to nutrient mining and erosion in Kampala, expanding population and the introduction of annual food and income crops need more extensive tillage. For instance, farming is carried out on tiny plots of land between 0.5 and 1.5 hectares in the Ugandan Lake Victoria area.[62]

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[58]Nzeako,S. O., H. Talwana, E. Teye, I. Sekanjako, J. Nabweteme, and M. A. Businge. "Characterization of the Soil Nematode Fauna of Makerere Hill, Kampala, Uganda" *Journal of Entomology and Nematology* 11, no. 6 (2019): 70-84.

[59]Babirye, Prudence Mary. "Levels of selected toxic metals in surface soil from electronic waste dismantling areas of Kampala City." PhD diss., Makerere University, 2022.

[60]Amulen, Judith, Hillary Kasedde, Jonathan Serugunda, and Joseph D. Lwanyaga. "The potential of energy recovery from municipal solid waste in Kampala City, Uganda by incineration." *Energy Conversion and Management: X* 14 (2022): 100204.

[61]Ibid

[62]Havik, J. C. N. "The fate and transport of nutrients in shallow groundwater and soil of an urban slum area in the city of Kampala, Uganda." Master's thesis, 2012.

Farmers in the Kampala wetlands are increasingly referring to the lunnyu phenomena as soil infertility, according to scientific research. To show that topographically related soil profiles that predominate in Kampala throughout certain areas, the metaphor of lunnyu soils has been employed as a catena idea. However, due to the non-linear interactions between soil characteristics and landscape features, these models' prediction ability across broad regions are constrained.[63]

2.3. History of Wetlands in Kampala

This section provides an account of the agrarian evolution on wetlands in Kampala. The emphasis is to show the key events that have taken places in the growth of Kinawataka, Luzira and Lubigi wetlands in Kampala agrarian areas since 1900.

During the period before20thcentury, wetlands such as Kinawataka, Luzira and Lubigi were considered as great sources of natural ecological zones and thus respected by people through their cultures and traditions.[64] From the period 1900 to the 1980s, most of the wetlands in Kampala were looked at as more of waste lands and as well no proper and direct care by the government. Such a situation later attracted agrarian activities.[65] The most common agrarian activities carried out in most wetlands of Kampala included crop cultivation covering about three quarters of the reclaimed area, papyrus harvesting, fish farming and livestock keeping.[66]

Kinawataka, Lubigi and Luzira wetlands were named after the areas they occupy and run through.

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[63]Fungo, B., Sabine Grunwald, M. M. Tenywa, Bernard Vanlauwe, and P. Nkedi-Kizza. "Lunnyu soils in the Lake Victoria basin of Uganda: Link to toposequence and soil type." *African Journal of Environmental Science and Technology* 5, no. 1 (2011): 15-24.

[64]*P.Oosterveer and V. B. Vliet, "Environmental Systems and Local Actors: Decentralizing Environmental Policy in Uganda," Environmental Management, Vol. 45, No. 2, 2010, pp. 284-295. doi:10.1007/s00267-009-9423-4 [Citation Time(s):4]*

[65]*Were, A. N., Isabirye, M., Poesen, J., Maertens, M., Deckers, J., & Mathijs, E. (2013). Decentralised governance of wetland resources in the Lake Victoria Basin of Uganda.*

[66]*Ibid*

Before 1900, these wetlands were first used by household Baganda in Kampala who knew the importance of wetlands as either traditional ritual or spiritual zones for cleansing and treatment of traditional illnesses or subsistence agriculture.[67]Attempts by city planners to protect wetlands in Kampala begunin1912 when a series of physical planning schemes were initiated by the colonial government. One of such schemes was produced in 1912. This was followed by a series of others in 1919, 1930, 1972 and in 1994 when a structural plan was made. Despite these planning schemes, developments in Kampala especially commercial agronomy continued to be haphazard, unplanned and located outside planned area thus, continued impact on the wetlands.[68]

By 1920, people had begun inheriting and buying bibanja around Kampala wetlands which gave them a lot of confidence to utilize these wetlands formally for using them for agrarian practices which have persisted to-date.[69] Land acquisition in wetlands has been blamed on government authorities' failure to implement/enforce the planning schemes, continued political interference, conflicting land use policies, uncoordinated instructions between KCC and Ministry of Local Government and at times State House.[70]

By 1950s, wetlands in Kampala had been commercialised for cultivation of plants such as sugar-cane and cocoyam, which thrived well in waterlogged soils.[74]Besides, population pressures in the

[67]*Okurut, O. J. (2009). Environmental communication and wetland conservation: a study of how NEMA uses communication to raise awareness and promote wetland conservation in Kinawataka and Nakivubo wetlands in Kampala, Uganda (Master's thesis).*
[68]*Bashaasha, B., Mangheni, M. N.,&Nkonya, E. (2011). Decentralization and rural service delivery in Uganda. Internet. Food Policy Research Inst.*
[69]*Kalanzi, W (2015). Local governments and wetland conservation in Uganda: contributions and challenges. Journal of Public Administration, 50(1), 157-171.*

[70]*Businge, Z. (2017). Drivers of wetland degradation in Western Uganda and Iceland, and how they are addressed in current policies and legal frameworks. United Nations University Land Restoration Training Programme [final project].*

area surrounding these wetlands were on increasing trajectory of population by late 1950s.This came along with continued removal of the endemic papyrus vegetation in favour of the agricultural crop production mainly cocoyam.[71]

Following the closure of the former Jinja industrial hub in late 1950s and 1960s, there was a re-location of most of the former industrial labour to Kampala and majority decided to encroach on public nature of wetland resources for agriculture so as to earn a living.[72] For instance, accounts indicate that most of the former employees from the Jinja industrial hub settled around Kinawataka and Luzira wetlands and resorted into urban agrarian practices that have grown over time since then.[73]

The economic decay and civil war of the 1970s and 1980s left majority of the residents in Kampala with no choice but resort to wetlands for both settlement and agriculture. By 1971, the removal of papyrus vegetation in favour of agricultural activities became more prominent but with significant implications for the physical structure of the wetland due to changes in both the plant canopy and the rhizome system.[74] In an oral interview with an elderly in Kinawataka, he informed the researcher that;

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[71]*Goodfellow, T.(2013). Planning and development regulation amid rapid urban growth: Explaining divergent trajectories in Africa. Geoforum, 48, 83-93.*

[72]*Nyakaana, J. B., Sengendo, H., &Lwasa, S. (2007). Population, urban development and the environment in Uganda: the case of Kampala city and its environs. Faculty of Arts, Makerere University, Kampala, Uganda, 1-24.*

[73]Nord, C., & Byerley, A.(2020). Translocal optimisation: assembling rural and urban spaces for later life in urban Namibia and Uganda. *Journal of Southern African Studies*, *46*(1), 109-127.

[74]*Johns, T., Powell, B., Maundu, P., & Eyzaguirre, P. B.(2013). Agricultural biodiversity as a link between traditional food systems and contemporary development, social integrity and ecological health. Journal of the Science of Food and Agriculture, 93(14), 3433-3442.*

"As you see now, wherever you are seeing sugarcane, potatoes, yams and vegetables in these water logged areas, there used to be green cover full of papyrus and rids…now these are no more…yet, during the time when I was just a teen probably by 1970, we would grow some food but not on large scale like this to destroy all the tall wild grass that was protecting the soils from being washed away…"[75]

This reveals the extent to which by 1970, agrarian practices were already encroaching on the vegetation of wetlands in Kampala. This and other socio-economic factors have contributed to agriculture being a visible part of the city's wetland life.[76]Between 1980 and 2002, agriculture contributed to 62.2% of encroachment on wetlands in Kampala coupled with increase in urban population.[77]In 1989, there was an establishment of the National Wetlands Program of Uganda with the aim of assisting the government in the development of a national policy for the conservation and management of wetlands. This came with a lot of expectations to create alternatives to unsustainable use and abuse of wetlands as well as streamlining wetland management.[78]However, from the accounts given from the field, these hopes seem to have been frustrated by the increasing encroachment on wetlands by agriculturalists. For instance, a female elderly in Bwaise argued that;

"When the NRM government came to power, they told everyone that the wetlands are mean to be protected by the government and whoever was using them for any

[75] In depth interview with a 76 year male elderly at Kinawataka, 2022

[76]*Isunju, J. B., Orach, C. G.,& Kemp, J. (2016).Community-level adaptation to minimize vulnerability and exploit opportunities in Kampala's wetlands.* Environment and Urbanization, *28(2), 475-494. Johns, T,etal.,(2013).*

[77]*Saunders, M. J., Kansiime, F., & Jones, M. B.(2012). Agricultural encroachment: implications for carbon sequestration in tropical African wetlands. Global Change Biology, 18(4), 1312-1321.*

[78]*Waswa, H., Kakembo, V, &Mugagga, F.(2019). A spatial and temporal assessment of wetland loss to development projects: the case of the Kampala–Mukono Corridor wetlands in Uganda. International journal of environmental studies, 76(2), 195-212.*

> *activity including agriculture was to be held responsible for degradation…however, over time, I have seen the number of people growing crops from these swamps increasing as the market also increases and the government hasn't taken serious action up to now."*[79]

Therefore, the hopes that had been raised following the establishment of the National Wetlands Program of Uganda have not met the expectations of Ugandans in terms of protecting wetlands in Kampala from agrarian practices.

Before 1990, most parts of Lubigi wetland were known for permanent mosaic of water and herbaceous or woody vegetation that covered extensive areas. However, from 1990 onwards, the wetland experienced an occupation by human activity mainly with livestock activities and wetlands with crop farmland activities.[80]From 1994 onwards, agrarian activities on this wetland increased from 14% to 18% and the intact wetland had decreased by 46%. Besides, the quality of water flowing into and out of Upper Kinawataka wetland had been affected partly by agriculture.[81]

By 1999, a lot of cocoyam led to the removal of the aboveground papyrus vegetation and the rhizomes were left to decompose.[82]By 2000, these wetlands had witnessed anthropogenic human activities mainly agrarian activities that posed the biggest threat to Lubigi wetland eco-systems in Kampala. The agrarian activities done mainly for short-term human consumptive purposes, they have been increasingly affecting the ecosystem of the wetland as more wetland areas have been

[79]IDI with a 52 female participant in Bwaise, 2021
[80]*David S. et al. (2010.) Changing Trends in Urban Agriculture in Kampala. In: Prain G., Lee-Smith D.,Karanja N. (eds) African Urban Harvest. Springer,New York, NY. https://doi.org/10.1007/978-1-4419-6250-8_6*
[81] Ibid
[82]*Chalin,V.,Golaz, V.,& Médard,C.(2015).Land titling in Uganda crowds out local farmers. Journal of Eastern African Studies, 9(4), 559-573.*

lost to agricultural activities.[83] Besides, by 2007, anthropological agrarian activities such as draining away of water for agriculture and livestock farming, harvesting of cyperus papyrus and other plants had reduced Lubigi wetland the ability to serve as the largest Lake Kyoga drainage basin.[84]Therefore, for over a century and decades, wetlands in Kampala have experienced different forms and shifts evolving from areas considered as waste lands to areas of great importance for human agrarian activities coupled with human pressure mainly from drainage for agriculture and over harvesting of wetland products.85

[83]*Sebastian, R., Lubowa. A .etal (2008).The association between household food security and urban farming in Kampala. In: Cole, D., Lee-Smith, D and Nasinyama, G. (Eds), Healthy city harvests: Generating evidence to guide policy on urban agriculture. International Potato Center (CIP) and Makerere University Press*

[84] Marx, C., Johnson, C., &Lwasa, S. (2020). Multiple interests in urban land: disaster-induced land resettlement politics in Kampala. *International Planning Studies*, *25*(3), 289-301.

[85]GoU (2000) [Government of Uganda]. Plan for Modernisation of Agriculture: Eradicating Poverty in Uganda. Kampala, Uganda: Government of the Republic of Uganda.2000

CHAPTER THREE

3.0. THE GENESIS OF AGRARIAN EVOLUTION ON WETLANDS IN KAMPALA

The previous chapter analysed the geography and history of wetlands in Kampala District. This particular chapter focuses on the genesis of agrarian evolution on wetlands in Kampala, access to land by the urban poor, Government policies and strategies. It includes the genesis of agrarian evolution on wetlands raging from the pre-colonial, colonial and the post-colonial era. This is important in analysing the historical trends of agrarian evolution on wetlands in Kampala district.

3.1. The Genesis of Agrarian Evolution on Wetlands in Kampala

By the genesis of agrarian evolution on wetlands in Kampala, it connotes to the historical account of the emergency and growth of agricultural practices within the wetlands of Kampala. Therefore, this section gives an historical account of how agrarian activities in wetlands can be traced from the pre-colonial times through the colonial and post-colonial period in Kampala up to 2010. These accounts are fundamental in giving a clear historical view of the agrarian practices in the wetlands of Kinawataka, Luzira and Lubigi in Kampala.

3.1.1. Wetland and Agriculture during the Pre-Colonial Buganda.

There were pre-colonial customary practices in Buganda which guided land use practices for centuries before colonialism. In this case, wetlands were treated as ritual-based places in which specific agrarian practices could not be allowed to take place. During pre-colonial Buganda, it was taken as a taboo and people would under-go cleansing and were restrained by old taboos and superstitions to refrain from activities that would lead to crises in wetlands. However, a poor lead and indication on how contemporary African societies are influenced by Christianity and Islam and no longer restrained by age old taboos and superstitions and driven by the realities of a global

competitive economy dominated by selfish western world economics explain the current agrarian evolution crises on wetlands in Kampala.

Traditionally, wetlands in Buganda from which the city of Kampala evolved, have existed since the earliest time. However, it is not clear how these wetlands immersed. Before the colonialists came to Buganda, wetlands were safe and they were used purposely for food hunting. According to Naiga, "wetlands emerged as a result of surface run-offs which came with the papyrus seeds from uphill of Kasubi, Mengo, Kibuli, Namirembe, Lubaga, Nsambya and Old Kampala. Therefore, surface run-offs were the main contributors as far as wetland evolution especially the Lubigi is concerned although birds and some human beings were influential."[1]

In the pre-colonial times, traditional indigenous management systems, although quite diverse, tended to have two common elements. First, there were rules and rights concerning access to all resources including wetlands. These rules and rights determined who could enter and use a wetland for specific purposes.[2]

However, increasing intensity of such agrarian activities and practises were possible under low population densities, which is not the case today. Population increase in Kampala has continued to be registered, adding pressure to the already threatened wetland resources.[3]Traditional practises mainly emphasised sustainable utilisation such as aesthetic value and revolved around various

[1]Nelson, T., David, et al (2017). Awareness, perceptions and implementation of policy and legal provisions on wetlands in Uganda *African Journal of Rural Development (AFJRD), 2*(1978-2017-1910), 161-174.
[2]Nyakaana, J. B., H. Sengendo, et al. Urban Development, Population and the Environment in Uganda: The. Case of Kampala City and its Environs.2004
[3]National Wetland Programme (2000). District inventory report for Rakai990.

controls to ensure sustainability and existence of various resources.[4]They were based on acceptable, though not documented rules and regulations for example with papyrus, there was selective harvesting of only culms for use in a particular activity like craft making, grass was clearly cut in blocks using rotational system to allow regeneration,[5] wetland edge grazing and agriculture was done during dry season, harvesting was only before moon especially for palms.[6]

In pre-colonial Buganda where Kampala is located, land tenure arrangements were decentralized along clan-based tenure system and in most cases, important resource areas such as swamps were treated as common property which people had access to for subsistence agrarian purposes through customary setting but handled with sustainable cause.[7] With such customary guidance, the use of wetlands to acquire shrubs was sustainable that the whole plant was not cut. Instead, mature and dry twig was collected, quantities of herbs for specific period was collected and preserved and this was only done by herbalists who also controlled over-harvesting. Pregnant animals were not hunted, wild foods were harvested during all season's droughts ensuring their availability during all seasons. Water for domestic use was done at particular points, entry was restricted for people except during various ceremonies.[8] Habitants were thus conserved as a result. People were more familiar and appreciated tangible benefits that wetlands provided in the past.

[4]Dugan, P., & Dungan, P. J. (Eds.). (1990). Wetland conservation: A review of current issues and required action.

[5]Byakagaba, P., Egeru, A., Barasa, B. *et al.* Uganda's rangeland policy: intentions, consequences and opportunities. *Pastoralism* **8,** 7(2018). https://doi.org/10.1186/s13570-017-0111-3

[6]Aandahl, G. (2012, March). Sharing Water: Problems, conflicts and possible solutions–the case of Kampala. In *Forum for Development Studies* (Vol. 39, No. 1, pp. 139-146). Routledge.

[7]Omolo-Okalebo, F.(2011). *The Evolution of Town Planning Ideas, Plans and their Implementation in Kampala City 1903-2004* (Doctoral dissertation, KTH Royal Institute of Technology).

[8]Obaikol, E.,& ALLIANCE, U. L. (2014). Draft Final Report of the Implementation of the Land Governance Assessment Framework in Uganda. *World Bank Group, Washington, DC*

However, it should be noted that traditional practises ensured controlled use but were also sustainable under low population.[9] This is not the case today, hence a threat to services provided by wetlands in Kampala. Uses and users have changed with time.[10] Existence of alternative tastes and skills and needs has increased the dependence on wetland resources in Kampala due to changes in marketability of cash crops, increased costs for survival which cannot be matched by the poor among others, has seen a high priority attached to wetland resources in Kampala over time.[11]Wetlands have thus moved from resources used for domestic purposes to cash resources and urban survival avenues.[12] Thus, agriculture in Kampala wetlands is attributed to increasing population and changes in climate where some long dry spells are experienced in Kampala which forces people to encroach on wetlands for agrarian purposes.[13]

The shift from preservation traditions to agrarian based encroachment in wetlands resulted into reduced long-term production for human needs, lower water tables and change micro climates. Wetland resources were considered positively as fodder, especially during dry periods, when alternative pastures were not readily available. Pastures from wetlands not only provided fodder but also enhanced milk production thus contributing to food security.[14] Furthermore, wetlands

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Availablonlineat: http://sitresources.Worldbank. org/INTLGA/Resources/Uganda_Draft_Report. Pdf.

[9]Ntambirweki, J. (1998). The evolution of policy and legislation on wetlands in Uganda. *Case study prepared for the technical consultation on designing methodologies to review laws and institutions relevant to wetlands. Switzerland*.

[10]Hoppe, K. A. (1997). Lords of the fly: colonial visions and revisions of African sleeping-sickness environments on Ugandan Lake Victoria, 1906–61. *Africa*, *67*(1), 86-105.

[11] Chris, A. (2001). A public open space typology for Kampala, the development of form through studying traditional open space.

[12]MKisamba-Mugerwa, W., & Nuwagaba, A. (1993).Comparative and multidimensional analysis of communal and private property resources (land) tenure and rural development in Uganda.

[13]Ibid.

[14] Wily, L. A.(2013). Looking back to see forward: the legal niceties of land theft in land rushes. In *The New Enclosures: Critical Perspectives on Corporate Land Deals* (pp. 145-170). Routledge.

were valued as the most reliable water sources for livestock and this was more pronounced during dry seasons when most water sources dried up and large herds of cattle needed water for drinking.[15] However, as time went by, there was need for sustainability of water and green pasture for large herds of cattle during both wet and dry seasons and to also benefit from the fertile soils around wetlands. This led to small scale settlement and farming around wetlands like Lubigi where people settled to not only grow yams, sugar-cane and banana but also collecting water for their animals.[16] However, much as wetlands in pre-colonial society of Buganda experienced encroachment it was not a threat as it is today.

By inference therefore, before the establishment of colonial rule in Uganda, communities in the area where we find Kampala today had various customary rules to govern the use of wetlands through communal norms, values and belief systems for preservation built along cultural traditions and rules or informal institutions. All members of the community had learned through their oral traditions about penalties, sanctions and incentives to ensure that all members adhered to the socially acceptable use of wetlands in their surroundings and certain tree and grass species were given special protection because of their medicinal uses. All these played an important role of regulating activities in and around wetlands.

3.2.1. Introduction of Crops and Farming in Wetlands

Swamp based farming became dominant among some populations, perhaps two or three thousand years ago and soon became the dominant technique of production for most societies including

[15]Good fellow, T.(2013). Planning and development regulation amid rapid urban growth: Explaining divergent trajectories in Africa. *Geoforum*, *48*, 83-93.

[16]J. Hartter and J. S. Ryan, "Top-Down or Bottom-Up? Decentralization, Natural Resource Management, and Usufruct Rights in the Forests and Wetlands of Western Uganda," Land Use Policy, Vol. 27, No. 3, 2010, pp. 815- 826. doi:10.1016/j.landusepol.2009.11.001

Buganda where modern Kampala is located. Farming in swamps as a main way of life still relied on ancillary activities of which gathering, animal husbandry and fishing in swamps were the most important ways of survival three thousand years ago.[17]After 1500, written records as well as linguistic distributions and etymologies and ethnographic data all contribute to our knowledge that the people of Buganda had a hierarchical set of food taboos in mourning which parallels in reverse the introduction of staple crops in the area from matooke, sweat potatoes, cassava, millet to sorghum.[18]

Between 1600 and 1700, there was introduction of an active form of vege-culture involving yams and palm trees within most of the swamps in East Africa mainly among the proto-bantu community with cereal crops, root crops, pulses, vegetables and probably several types of fields.A number of swamp-based staples such as yams, sugar-cane, matooke and vegetables were grown in Buganda where modern Kampala is before 1880; it implies that there was a farming history of pre-colonial Kampala.[19]The people of Kampala mainly grew matooke (Banana) which was the staple food. Plantations were very common to the extent that even in the Kabaka's palace there was a plantation "olusuku" lwaNabagereka'' (Queen's plantation) from which the family could get food.[20] The land between Rubaga and the lake shore was given to the royal women for agriculture including Lubigi

[17]Gumm, E. (2011). The use and misuse of wetlands in Kampala.

[18]Vansina, J. (1979).Finding food and the history of pre-colonial equatorial Africa: a plea. *African Economic History*, (7), 9-20.

[19] M. Guthrie, Comparative Bantu, volume two, Farnborough, 1971, p. 11, esp. 83:25, and fn. 9. Guthrie is not always reliable. There is evidence for a Proto Bantu term: "gourd" and another one "millet/sorgho".

[20]J.D. Clark, The Prehistory of Africa, London, 1970, p. 205; J.R. Harlan, Jan De Wet, and A Stemler, "Plant Domestication," in J.R. Harlan et al., pp. 12-13. The term vege-culture is unsatisfactory because it still obscures too much the notion that domestication is a process of which the "vege-cultural" stage is a part that cannot be sharply distinguished from the next stages.

wetland. They grew plantains for both court and wider consumption since food distribution was one of the principles of the king.[21]

The bananas were of three species; the female for food with different types such as Nakitembe, Nakabululu, Kibuzi, Nsakala, Muvubo among others.[22] The second is the male species for beer and the last is yellow bananas for fruit such as Diaz, Cavendish and Bbogoya. The bananas plantations were mostly attended by women, although the men could have their own plantation from which their wives were not allowed to harvest without their orders a system that helped to prevent famine. Matooke could be steamed or prepared as katogo mixed with beans, or ground nuts. The Ganda believed that the bananas were carried by Nambi Nantuttulu together with her husband Kintu from Ggulu's palace.[23]

The yams were also an important type food in Kampala that used to be grown in the wetlands of Bwaise, Katwe, Nalukolongo, Kyambogo and Kisenyi.[24] Hitherto, yams are still grown in Kampala wetlands like Kinawataka, Lubigi and Luzira among others. It was loved for giving energy and staying for several days without rotting. Sweet potatoes were grown in wetlands but cassava was rarely eaten as a meal. According to Yoga, cassava was nick named "Buriti", or "Emimbati", a name which depicted that it was a hard type of food and disliked by many.[25] It was

[21]Richardson, B. J. (1993). Environmental management in Uganda: the importance of property law and local government in wetlands conservation. *Journal of African law*, *37*(2), 109-143.
[22]Borrini, G., Jaireth, H.etal (2007). *Sharing power: learning-by-doing in co-management of natural resources throughout the world*. Earthscan.

[23]Koohafkan, P., & Altieri, M. A.(2011). *Globally important agricultural heritage systems: a legacy for the future*. Rome: Food and Agriculture Organization of the United Nations.
[24]Richardson, B. J. (1993). Environmental management in Uganda: the importance of property law and local government in wetlands conservation. *Journal of African law*, *37*(2), 109-143.
[25]Richardson, B. J. (1993). Environmental management in Uganda: the importance of property law and local government in wetlands conservation. *Journal of African law*, *37*(2), 109-143.

during scarcity of other food stuffs that cassava was eaten. Sometimes it was eaten in the morning with break tea. However, some of the respondents that were interviewed revealed that crops such as cassava, maize and other food stuffs used to be given to Europeans in exchange of raw materials while others revealed that agrarian farmers used to sell food stuffs in Kampala for example yams that were grown in Lubigi wetland.[26] These yams would sometimes be sold on Bwaise streets and sometimes, exchanged for labour in the crop fields as barter trade.

3.2.2 The Colonial Administration and Changes in Wetland Use

As a result of the Buganda Agreement of 1900, Britain acquired the status of a protecting power over the Kingdom of Buganda in which Kampala was part. The British protectorate also took over all the natural resources such as wastelands which were all vested in the colonial administration.[27]A similar treatment was meted out to wetlands under the other two agreements concluded with Toro in 1900 and Ankole in 1901.[28]Specifically, 1900 Buganda agreement put wetlands and uncultivated land under colonial control of about 9,000 square miles. The 1900 agreement also introduced British Law in Buganda and later Uganda in 1902 and emphasised individual tenure and ownership as its key feature.[29]As stated by Ntambirweki;

[26]FAO. (2007) Profitability and sustainability of urban and peri-urban agriculture. Agricultural Management, Marketing and Finance Occasional Paper. Food and Agriculture Organization of the United Nations (FAO).
[27]Ntambirweki, J. (1998). The evolution of policy and legislation on wetlands in Uganda. *Case study prepared for the technical consultation on designing methodologies to review laws and institutions relevant to wetlands. Switzerland*.
[28]P. Oosterveer and V. B. Vliet, "Environmental Systems and Local Actors: Decentralizing Environmental Policy in Uganda," Environmental Management, Vol. 45, No. 2, 2010, pp. 284-21. doi:10.1007/s00267-009-9423-4 [Citation Time(s):4]
[29]Were, A. N., Isabirye, M.etal (2013). Decentralised governance of wetland resources in the Lake Victoria Basin of Uganda.

"…The right to the exclusive enjoyment of something based on rightful title. Freeholds, lease holds and "Mailo" tenures were established by both the agreements with the native kingdom and by statutes such as the Crown lands Ordinance of 1903."[30]

Therefore, under the Crown Lands Ordinance of 1903, indigenous Ugandans had no right to occupy any land outside the Buganda kingdom and urban areas were not granted in freehold or leasehold without prior license or consent in accordance with their customary law.[31] Without reference to the customary occupants of the land, many of the common peasants in Kampala were left with limited options but to settle in wetlands so as to grow food crops for survival.[32]

Since, wetlands had already been alienated to the Crown, individual estates were not granted on them as a matter of policy.[33] Where such grants were made the essence of ownership entitled the grantee almost unfettered rights of use and abuse, limited only by the eminent domain of the Crown.[34] As a result, people dwelling near wetlands used this opportunity to cultivate crops even those that had been considered as a taboo such as sugar-cane, yams, and sweet potatoes in Lubigi, Luzira and some parts of Kinawataka wetlands on a large scale.[35]

The British colonial government recommended draining the swamps in Kampala in the early twentieth century to combat the problem of malaria, and the Nakivubo channel was built for this

[30] In-depth interview with 75 year old man in Luzira wetland
[31]Mabikke, S. B. (2016). Historical continuum of land rights in Uganda: a review of land tenure systems and approaches for improving tenure security. *Journal of Land and Rural Studies*, *4*(2), 153-171.
[32]Otai, D. (2011). The role of wetland inspection decision in promotion of wetland conservation: a case study of Mutungo Parish Kampala District.
[33] Okurut, O. J. (2009). *Environmental communication and wetland conservation: a study of how NEMA uses communication to raise awareness and promote wetland conservation in Kinawataka and Nakivubo wetlands in Kampala, Uganda* (Master's thesis).
[34]John, S. (2013). The land question in Uganda has the law failed to resolve this question?
[35]Ibid

purpose in the late 1930s.[36] Increasingly, through planned and unplanned actions, almost 50% of the wetlands and swamps of Kampala got exposed to being drained and turned into settlements and cultivated land which normally blocked the natural flow of water and intensified the problems of floods (during heavy rain) and water scarcity (the rest of the year).[37]The draining of swamps created space for Kampala dwellers to utilise the reduced water levels in swamps and grow crops that would not have been grown in fully water-logged swamps mainly in Lubigi and Luzira.[38] These crops included banana and sweat potatoes that could easily be spoilt by high water levels. Although it begun on a small scale, as time went on, the farmers engaged in commercial farming to supply the then small markets like that of Bwaise and other slum settlements that immersed in different parts of Kampala town.[39]

As a result, wetlands such as that of Kinawataka were encroached on for both settlement and cultivation of crops such as sugar cane, banana and yams. Lubigi was mainly used for growing yams and sugar-cane while that of Luzira was mainly used to grow matooke, yams, beans, sweat potatoes and sugarcane on top of settlement.[40]

Throughout the colonial era of management of wetlands in Kampala, there were a number of planning strategies expressed in the colonial planning schemes of Kampala city. These strategies had physical impacts on the use of wetlands as most of the people were forced to adopt the use of

[36]Terreni Brown, S. (2014). Planning Kampala: Histories of sanitary intervention and in/formal spaces. *Critical African Studies, 6*(1), 71-90.
[37] Ibid Okurut, O. J. (2009)

[38] Kiyemba, G. E. (2011). The critique of the Legal Frame Works for the Protection of Wetlands in Uganda: A case study of Kampala Capital City Authority.
[39]Bashaasha, B., Mangheni, M. et al (2011). *Decentralization and rural service delivery in Uganda*. Internat. Food Policy Research Inst.
[40]Kalanzi, W.(2015). Local governments and wetland conservation in Uganda: contributions and challenges. *Journal of Public Administration, 50*(1), 157-171.

wetlands for agrarian activities because the uplands were reserved for settlement.[41] Indeed, the first modern urban planning scheme for Kampala was under-taken in 1912, covering Nakasero and Old Kampala hills. It comprised of 567 hectares of land for development and accounted for a population of approximately 2,850 people. This was followed by additional planning schemes under-taken in 1919, 1930, and 1951.[42] All of the urban planning schemes provided for the gazette areas for industrial development, settlement and infrastructure but did not gazetted land for agrarian practices. By implication, the uplands those were formally used for agrarian practices by the people of Kampala new and dedicated to industrial and urban infrastructural development. The only remaining land that could be used for agriculture was in the wetlands. As a result, most of the people who lost uplands for agriculture resorted into utilizing wetlands of Kinawataka, Lubigi and Luzira for growing yams, sugar-cane, and bananas.[43]

In an interview with an elderly aged 72, he argued that;

> *"My father explained to me on how he ended up in Jenimah suburbs not only construct a home but also to cultivate from the swamps of Lubigi…the story he gave was linked to the taking of the upland in upper Namungona by the British and he had nowhere to take us for…up to date, we are still in Jenimah where you have found us…I have a number of gardens around."*[44]

[41]Businge, Z. (2017). Drivers of wetland degradation in Western Uganda and Iceland, and how they are addressed in current policies and legal frameworks. *United Nations University Land Restoration Training Programme [final project]*.
[42]Goodfellow, T.(2013). Planning and development regulation amid rapid urban growth: Explaining divergent trajectories in Africa. *Geoforum*, *48*, 83-93.

[43]Johns, T., Powell, B,etal (2013).Agricultural biodiversity as a link between traditional food systems and contemporary development, social integrity and ecological health. *Journal of the Science of Food and Agriculture*, *93*(14), 3433-3442.
[44]In-Depth Interview with a 72 year old at Jenimah, along Kyebando road

One can strongly argue that both the British protectorate and the government of Uganda did not give a lot of priority to management of wetland resources because their basic concern was with the control of water resources.[45] Given the fact that wetlands were not the major water resources in Kampala, they were ignored and left in the hands of the Kampala dwellers to utilize them in growing crops for food and commercial purposes. Besides, between 1900 and 1962, the colonial government considered other resources of the wetlands apart from water of less value than other areas of the wetland apart from the water resources were considered wastelands.[46] Specifically, in Lubigi, Gideon and Bernard argued that the Crown had alienated most of the land to itself and that the British law allowed individuals to encroach on wetlands, natives utilised these wetlands for agrarian activities.[47]

Throughout the colonial regime, wetlands remained a property of nobody and with increase in population in Kampala by the 1960s, wetlands became main targets for the poor and struggling farmers who acquired leaseholds upon these wetlands and commenced programmes of draining them to convert them into agrarian farms.[48] For instance, in Lubigi wetlands, although it was hard for people to settle, they freely established yam plantations in the early 1930s and later extensive vegetable growing by 1950s in order to supply the then growing food markets in Kampala. For the

[45]Gideon,O. J., & Bernard, B. (2018).Effects of Human Wetland Encroachment on the Degradation of Lubigi Wetland System, Kampala City Uganda'. *Environment and Ecology Research*, *6*(6), 562-570.

[46]Kinobe, J. R., Niwagaba, C. B., Gebresenbet, G., Komakech, A. J., &Vinnerås, B.(2015). Mapping out the solid waste generation and collection models: The case of Kampala City. *Journal of the Air & Waste Management Association*, *65*(2), 197-205.

[47]Omolo-Okalebo, F.(2011). *The Evolution of Town Planning Ideas, Plans and their Implementation in Kampala City 1903-2004* (Doctoral dissertation, KTH Royal Institute of Technology).

[48]Munger, E. S. (1951). *Relational patterns of Kampala, Uganda*. University of Chicago.

case of Luzira and Kinawataka Wetlands, natives in Kampala did not only settle but also embarked on serious cultivation of sugarcane.

The scramble for wetland areas continued until of recent when the current Ugandan government has intervened to introduce new policies and approaches to these resources.[49] The change in policy from the traditional norms, values and belief system that geared at conservation of some species in the wetlands to the colonial policies that rendered the wetlands ungoverned, a lot of encroachment on these wetlands for agriculture was experienced to have increased to over 30% wetland reclamation by 1960.[50] In the colonial era, many Ugandans were no longer worried of the penalties that had been socially constructed by the traditional institutions for destruction of the wetlands thus, giving a leeway for many to conduct agrarian activities in the areas of Kinawataka, Lubigi and Luzira.

2.2.3 The Post-colonial Period and Increased Encroachment of Wetlands

During the period between 1962 and 1971, many wetlands were encroached on by the local people. Most wetlands were utilised with care so much that although agrarian activities took place, the wetlands had not been depleted as later they came to be.[51] This is because these wetlands were not centrally controlled by the post-colonial government as the people used them for agriculture until 1974.

[49]Monteith, W.(2019). Markets and monarchs: indigenous urbanism in postcolonial Kampala. *Settler Colonial Studies*, *9*(2), 247-265.
[50]Aryampa, S.,Maheshwari, B.etal (2019). Status of waste management in the East African Cities: Understanding the drivers of waste generation, collection and disposal and their impacts on Kampala City's sustainability. *Sustainability*, *11*(19), 5523.
[51]Kibirige D (2006).The Hills of Kampala and their history .Tour guide publications, Kampala, Uganda

In 1966, Bemba was chosen by the Kabaka to be a spiritual leader in the Buganda Kingdom.[52] She was to work closely with the spirit of the snake Kabaka. During the bush war, she found money and bought her plot in Lubigi wetland, which she found to be filled with spirits.[53] During the Bush War, NRM soldiers would come to Lubigi wetland and ask her to guide them and to perform rituals, and that she aided in Yoweri Museveni's rise to power in 1986.[54] However, she was chased away by the government in 2009. When she lived in Lubigi she cultivated native staple crops like yams, potatoes among others, which enabled her earn a basic living.[55]When Bemba lived in Lubigi she was not poor and had many visitors, and now that she was forced out she, had no money and people no longer came see her anymore. Bemba Musota's story is a critical piece of understanding the culture and history that surround Lubigi wetland. There is a great irony in her 2009 eviction, as settlement and wetland degradation did not become a significant issue until the Northern bypass was constructed.[56] Bemba's role as a spiritual leader also positioned her as a bastion of social community cohesion. Evictions by the KCCA functions to destroy social systems and communities because you cannot separate Lubigi wetland from farming.[57]These, along with poverty and land scarcity create less cohesive communities that no longer have contact with their traditional methods of governance and conservation. This highlights how eviction and forced migration to and from Lubigi have enormous social costs.[58]This is substantiated by one of the Senior Legal Officers at NEMA, who stated that wetlands are sacred to the Baganda and very well cared for, and that all of the traditional herbalist that lived in were treated with much respect.

[52] Stock, Adele, because this land is free. A historical Perception on Poverty ,Settlement, and Conservation in the Lubigi swamp (2018)
[53] Mutabazi S (2017) The Genesis of Kampala Northern Bypass ,Uganda road sector
[54] Ibid
[55] Ibid
[56] Ibid
[57] Ibid
[58] Mugumya F (2013) Governance dynamics disabling the sustainability of community

However, in 1975, all wetlands were later put under centralised control following the fundamental changes introduced in 1975 by way of the "Land Reform Decree."[59] The 1975 land decree declared all land in Uganda as public land to be managed by the Uganda Land Commission (ULC).[60] This declaration enabled the government of President Idi Amin Dada to reduce on the encroachment on wetlands for agriculture and other activities as people in Kampala were worried of the heavy punishments that would result from any misuse of wetlands.

Despite the fact that this was a good move towards protecting such land spaces in Kampala, it was short-lived. Amin's government collapsed in 1979. This period was also characterised by political instability until 1986.[61]To make matters worse, there was no effective natural resource management. The obvious effect of this was mainly people in Kampala utilizing wetlands for agriculture.[62]

Therefore, prior to 1986, wetlands were not regarded as important resources and were referred to as waste-lands as no institution had the mandate to deal with wetland issues.[63] Many of the wetlands were communally owned and local communities had local by-laws governing them. Such by-laws would permit the growing of certain crops while prohibiting the growing of other crops in

[59]Rugadya, M.(1999, September). Land reform: the Ugandan experience. In *Land use and Villagisation Workshop. Kigali* (pp. 20-21).
[60]Ibid
[61]Suruma, E. S.(2014). *Advancing the Ugandan economy: A personal account*. Brookings institution press.
[62]Reid, R. J. (2017). *A history of modern Uganda*. Cambridge University Press.
[63]KCCA, (2012). Kampala Physical Development Plan; Updating Kampala Structure Plan and Upgrading Kampala GIS, Draft Final Plan.

the wetlands.[64] Therefore, this was giving room for agrarian practices in basic socially accepted crops to take place in these wetlands before 1986.

When the National Resistance Movement (NRM) took over power in 1986, it abolished large-scale wetland drainage.[65] This was done to halt the rate at which people were encroaching on wetlands for agriculture. The National Resistance Movement (NRM) also established the National Wetlands Program (NWP) in 1989, as a mechanism to formulate a national policy for the conservation and management of wetlands.[66] In 1991, the Government embarked upon the World Bank sponsored National Environment Action Plan process. This resulted in the adoption of a National Environment Management Policy and the National Environment Statute in 1994 and 1995 respectively.[67] All these were aimed at protecting among other things, wetlands from being encroached on by both agriculture and livelihood activities. Unfortunately, what happened was the opposite. They increasingly developed into agrarian centres.

The halting of wetland reclamation in the transition period towards the establishment of the 1994/5 environmental policies gave some breathing space for the wetlands from agrarian activities that

[64]Hartter, J., & Ryan, S. J.(2010). Top-down or bottom-up?: Decentralization, natural resource management, and usufruct rights in the forests and wetlands of western Uganda. *Land Use Policy*, *27*(3), 815-826.
[65]Nyakaana, J. B., H. Sengendo, et al. (2004) Urban Development, Population and the Environment in Uganda: The Case of Kampala City and its Environs.
[66]UPPAP.(2000) .Uganda Physical Planning Action Plan .Ministry of Housing and Urban.
[67]Ntambirweki, J. (1998). The evolution of policy and legislation on wetlands in Uganda. *Case study prepared for the technical consultation on designing methodologies to review laws and institutions relevant to wetlands. Switzerland*.[67] Hartter, J., & Ryan, S. J.(2010). Top-down or bottom-up?: Decentralization, natural resource management, and usufruct rights in the forests and wetlands of western Uganda. *Land Use Policy*, *27*(3), 815-826.
[67]Nyakaana, J. B., H. Sengendo, et al. (2004) Urban Development, Population and the Environment in Uganda: The Case of Kampala City and its Environs.
[67]UPPAP.(2000) .Uganda Physical Planning Action Plan .Ministry of Housing and Urban.
[67]Ntambirweki, J. (1998). The evolution of policy and legislation on wetlands in Uganda. *Case study prepared for the technical consultation on designing*

the rate of encroachment reduced.[68] However, given the fact that the period between 1986 and 1994 did not have clear and concrete policies to manage the wetlands, Kampala city dwellers went on to utilize Kinawataka, Luzira and Lubigi wetlands for agriculture.[69] It is argued that the driving force in this period of time was the increasing need for food supply to Kampala markets that came along with the peace that had been restored in Kampala.

In order to put the policy goals and objectives into practice and to provide a legal framework for implementing the policy, wetland related issues have been adequately incorporated into the National Environmental Statute 1995.The Wetlands policy can be strengthened by a supplementary law specifically addressing wetland concerns and reducing agrarian activities in wetlands.[70]Then in 1995, constitutional reforms brought about major changes in environmental management that wetlands were to be managed under de-centralized institutional framework.[71] These institutional frameworks have turned wetlands from being referred to as waste-lands as activities being conducted in these wetlands are being directly managed by the central and local government authorities.

[68]Waswa, H.,Kakembo,V., &Mugagga, F. (2019). A spatial and temporal assessment of wetland loss to development projects: the case of the Kampala–Mukono Corridor wetlands in Uganda. *International journal of environmental studies*, *76*(2), 195-212.
[69]Letema, S.C.(2012). *Assessing sanitary mixtures in East African cities*. Wageningen University and Research.
[70]Alegi, P. (2010). *African soccerscapes: How a continent changed the world's game*. Ohio University Press.
[71]Smardon, R. (2014). *Sustaining the World's Wetlands*. Springer.

However, even with such institutional frameworks, for the last 20 years, the wetlands have been put under considerable pressure from agriculturalists due to population increase resulting in the draining of many wetlands and the modification of several others in Kampala.[72]

Following the promulgation of the 1995 constitution of the republic of Uganda, it was the first time the constitution addressed the issue of wetlands among other natural resources. Article 237(1) of the Constitution vests land in the citizens of Uganda. Under Article 237(2) (b), however, wetlands among other resources are vested as follows:

> *"The government or a local government as determined by parliament by law, shall hold in trust for the people and protect natural lakes, rivers, wetlands, forest reserves, game reserves, national parks and any land to be reserved for ecological and touristic purposes for the common good of all citizens"*[73]

Besides, Section 38 of the National Environment Statute, 1995provides NEMA with authority in consultation with the lead agency the sustainable management of wetlands.[74]Therefore, since 1995, both the local governments and central government have been at the fore-front of protecting the wetlands in Kampala from being encroached on for agriculture. However, for the case of Kinawataka, Lubigi and Luzira, there are still pockets of small-scale agrarian activities taking place mainly those growing yams, sugarcane and bananas.[75].This is confirmed by one of NEMA officials in the following terms.

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[72]Turyahabwe, N., Tumusiime, D. M., Kakuru, W., & Barasa, B.(2013). Wetland use/cover changes and local perceptions in Uganda. *Sustainable Agriculture Research*, *2*(526-2016-37853).
[73]National Environmental Act, 1995: 237.
[74]Dennis, K., & Andrew, M (2005). The Effects of Wetland Degradation on the Socio Economic Welfare A case study of Nabisasiro Wetland in Rubaga division.
[75]Gideon, O. J., & Barasa, B.(2018).Effects of Human Wetland Encroachment on the Degradation of Lubigi Wetland System, Kampala City Uganda'. *Environment and Ecology Research*, *6*(6), 562-570.

"Besides, the increased competition for land in Kampala from 2000 onwards has made many low- and middle-income earners who survive on agrarian practitioners continue to encroach on the wetlands to cultivate food for survival and small-scale commercial production as most of the uplands are now occupied by construction and settlement."[76]

Furthermore, wetland reclamation and all other elements of agrarian practice in wetlands are controlled so much so that some activities such as the growing of rice was criminalized. Although farmers in Lubigi and Luzira wetlands have continued to secretly grow some rice, it is prohibited and their number is meagre.[77]However, the legal framework accepts some agrarian practices such as fish farming using ponds within these wetlands. This has made most of the farmers in Kampala to shift from growing yams and rice to fish farming mainly in Luzira and Lubigi wetlands.[78]

Therefore, the evolution of agrarian activities in Kampala wetlands has been persistently both a response to crisis and means for opportunity that urban agrarian activities remain vibrant and are critical to the well-being of many households in Kampala.[79] With the increasing demand for a wide range of food products, combined with close proximity to markets, Kinawataka, Lubigi and Luzira wetlands have been exposed to illegal but active conversion of vacant wetlands into agrarian centres.[80]

[76] National Environmental Act ,1995:237

[77]J. And J. Jabbour.National Wetland Programme (NWP, 2000).Managing wetlands with changing times, Uganda's experience .Makerere Institute of Social Research. Kampala, Uganda

[78]Doherty, J. (2019). Filthy flourishing: para-sites, animal infrastructure, and the waste frontier in Kampala. *Current Anthropology*, *60*(S20), S321-S332.

[79]Turyahabwe, N.,Tumusiime, D. M., Kakuru, W., & Barasa, B. (2013). Wetland use/cover changes and local perceptions in Uganda. *Sustainable Agriculture Research*, *2*(526-2016-37853). 52.

[80]Kakuba, S. J.,& Kanyamurwa, J. M. (2021).Management of wetlands and livelihood opportunities in Kinawataka wetland, Kampala-Uganda. *Environmental challenges*, *2*, 100021.

In an interview with one of the respondents from National Environmental Management Authority (NEMA), it clearly came out that foods security of the city is partly based on the agrarian activities taking place in the wetlands of Kinawataka, Lubigi and Luzira. In his words, he states that; "We support urban farming for purposes of food security and employment," but he urges wetland farmers to attend the authority's workshops to learn about farming on roof-tops and in other urban spaces to prevent further wetland encroachment.[81] In most cases, it is hard for NEMA to easily identify people encroaching in wetlands for agrarian activities that occupants of new slum areas of Kampala such as Nansana, Bwaise, Luzira and Kinawataka access nearby wetlands such as Lubigi, Luzira and Kinawataka as their main farming location whereas three-quarters of cultivation in the inner city is done on very small plots around the homestead.[82]

The enforcers of the environmental laws related to conservation of the wetlands in Kampala seem to be having indirect support to some agrarian activities in Lubigi, Kinawataka and Luzira wetlands for livelihood. These agrarian activities take a variety of forms but involve in most cases the extraction of natural wetland products like water for agriculture and livestock, fish, clay, medicine, sand and vegetation on top of real growing of crops.[83]

Nevertheless, urban farming on wetlands in Kampala is not looked at as a serious crime. Individuals using wetlands in Kampala comprehend the products they get from wetlands, so much

[81]Dalahmeh, S., irgani, S.,Komakech, A. J., Niwagaba, C. B.,& Ahrens, L.(2018). Per-and polyfluoroalkyl substances (PFASs) in water, soil and plants in wetlands and agricultural areas in Kampala, Uganda. *Science of the Total Environment*, *631*, 660-667.

[82]Kabiri, S., Allen, M., Okuonzia, J. T.,Akello, B., Ssabaganzi, R., & Mubiru, D. (2020). Detecting level of wetland encroachment for urban agriculture in Uganda using hyper-temporal remote sensing. *AAS open Research*, *3*, 18.

[83]David, S., Lee-Smith, D., Kyaligonza, J., Mangeni, W., Kimeze, S., Aliguma, L.&Nasinyama, G. W. (2010). Changing trends in urban agriculture in Kampala. In *African Urban Harvest* (pp. 97-122). Springer, New York, NY.

so that for many; wetlands are the sole source of livelihood.[84] However, the link between wetland conservation and their ecosystem services are often not well understood or are simply taken for granted. It is difficult if not impossible to stop human encroachment on wetlands for agrarian purposes because they are well-known for their ability to store, purify, and gradually release water. In so doing, wetlands control floods and provide water for life. Often, the functioning of wetlands is dependent on the dominant vegetation.[85] Depending on the functions in question, which in the context of this study are flood control and waste-water treatment, emergent wetland vegetation, particularly papyrus has been reported to be a better candidate. In the quest for wetland products, humans transform wetlands by draining the marsh and clearing the natural vegetation to maximize private benefits such as land for mainly cultivation and settlement.

Therefore, as inferences are drawn, the post-colonial Ugandan society has grappled with the challenge of wetland encroachment by agrarian activities. Ranging from unclear policies, political instabilities and institutional weaknesses in enforcement of laws for protecting wetlands, the people of Kampala mainly the poor and struggling peasants have over time utilised wetlands for agrarian practices as a means for survival.

[84]Adokorach, I. (2010). The impact of Population Growth on wetland Management-A case study of Katabu Zone, Kansanga Parish, Makindye Division.
[85]Gideon, O. J., & Barasa, B. (2018).Effects of Human Wetland Encroachment on the Degradation of Lubigi Wetland System, Kampala City Uganda'. *Environment and Ecology Research*, *6*(6), 562-570.

CHAPTER FOUR

4.0. REASONS FOR THE RAPID TRANSITION OF WETLANDS INTO AGRARIAN SPACES

4.1 Introduction

The previous chapter analysed the genesis of agrarian evolution on wetlands in Kampala. It particularly showed how land was accessed by the urban poor, government policies and strategies on wetlands in Kampala among others. This chapter examines the reasons for rapid transition of wetlands into agrarian spaces in Kampala, it also gives an account for urban farming, accessibility to land for urban farming, eco-culture, and effects of urbanisation, among others. The chapter begins with showing the arguments in support of urban agrarian activities over time.

4.2 Reasons for Rapid Transition of Wetlands into Agrarian Spaces in Kampala

4.2.1 The Arguments in Support of Urban Agrarian Activities in Kampala Wetlands

Unlike in the 18th and the 19thcenturies, where agrarian activities would be for subsistence purposes and on a small scale, in the 20th century, there were changing demands for agrarian products that came along with urbanisation around Kampala.[1] The shortfalls of the 1900 Buganda agreement gave a basis for arguments in support of urban agrarian activities in Kampala that were mostly carried out in wetlands.[2] The allocation of original Mailo holdings by the 1900 Buganda agreement took no account of the rights of peasant cultivators whose tenancy rights were recognised under the customary land tenure that had existed before colonialism.[3] The Mailo holdings came along

[1]Chris, A. (2001). *A public open space typology for Kampala, the development of form through studying traditional open space* (Master's thesis).

[2]Omolo-Okalebo, F.(2011). *The Evolution of Town Planning Ideas, Plans and their Implementation in Kampala City 1903-2004* (Doctoral dissertation, KTH Royal Institute of Technology).

[3]Ibid

with gazetting much of the upland for Buganda kingdom and its chiefs and the rest for the British colonial administration. Most of the local Ugandans in Kampala were left with no choice but seeking out for the remaining land for survival. Part of such land was only found in wetlands.

The 1928 Busuulu (ground rent) and Envujjo (tribute) Law boosted the number of wetland peasantry agrarian activities in Kampala wetlands because tenants were assured of the security of their agrarian products.[4] The 1928 Busuulu and Envujjo Law was an attempt to rectify this over-sight by providing tenant cultivators with security of their plots of land and setting fees which they were required to pay the Mailo holder. Under this law, peasants could not be forced off their holdings without a court hearing.[5] That is why, in Kinawataka, Lubigi and Luzira wetlands, people settled around these wetlands and extensively utilised them for agrarian practices which has been passed on to the following generations to-date.

Furthermore, by 1930s, peasant cultivators had settled in the lower lands in Kinawataka because of lack of access to ownership of the uplands and majority of the peasants encroached on the wetlands for agrarian activities given their proximity.[6] One of the elders in Kinawataka observed that "the chiefs and those in the administrative structures of the Buganda kingdom were the ones with access to land but not the common man in various parts of Kampala". This pushed most of the cultivators without landholdings to utilize and cultivate Lubigi and Luzira wetlands for growing yams and sugar-cane.[7]

[4]Matowu, J. M., Stewart, F., & Fitzgerald, V.(2001). Uganda: the social and economic costs of conflict. *War and underdevelopment, 2*, 240-288.
[5]Taban, W. O. (2012). The role of NEMA in the protection of the environment in Uganda.
[6]Aliguma, L. (2004) Strengthening urban and peri-urban agriculture in Kampala. Formal Survey Report. Urban Harvest and Centro Internacional de AgriculturaTropical (CIAT), Kampala, Uganda
[7] Ibid

The growth of urban agrarian activities was both a response to a crisis and a means for opportunity.[8] The crises that had been encountered by Ugandans in Kampala since 1900 and the desire for well-being among peri-urban dwellers contributed to the vibrancy of urban agriculture that became critical to the well-being of many households in Kampala.[9] For instance, farming in wetlands was influenced by the ever-increasing demand for more food by the urban population. Many people who had settled in the areas of Mbuya, Banda, and Kinawataka, had to solve the problem of food insecurity by cultivating in the nearby wetland to grow crops such as yams, vegetables, sugarcanes to mention but a few.

By 1958, the demographic pressures were already exacerbating the stress on Kampala's wetlands. Pressure on wetlands for agrarian practices, therefore, emanated from the growing demand for a wide range of food products in Kampala as a result of the increasing urbanisation. It ought to be noted that in 1961, Kampala experienced urban population growth of 7.58%, 3.88% in 1971, 6.93% in 1981, 6.75% in 1991, 5.84% 2001 and 5.83% in 2010.[10]This rising demand, combined with close proximity to markets led to the conversion of vacant wetlands into productive farm lands. Specifically, this led to creation of Urban and Peri Agriculture (UPA) for crop and livestock production in Kinawataka, Lubigi and Luzira wetlands in Kampala.

The violent bush war between 1981 and 1986 by the National Resistance Army (NRA) against the then Ugandan government disrupted the non-agricultural economic activities and pushed most of

[8]Uganda Urban Population 1960-2022

[9]Atukunda, G., Baseke, F., etal (2004) Farming in the city: Participatory appraisal of urban and peri-urban agriculture in Kampala, Uganda, CIAT Africa Occasional Publications Series, No. 42. CIAT, Kampala, Uganda.

[10]Nakazawa,M.(2020).Land Policy Reforms and Land Rights in Rural Uganda: Focus on Kibanja as a Tenant Right in Ganda Society. *Nilo-Ethiopian Studies*, *2020*(25), 1-14.

the Kampala dwellers into agrarian practice for survival.[11] Many companies were not working and as a result, they laid off many workers who resorted to agriculture and the only space for such activities were the wetlands.[12] In an in-depth interaction with a resident of Bwaise, an account was given that;

> *As a young vibrant man, by 1980, I had begun a wholesale shop in Kikuubo downtown that was vibrant…but when the war started in 1981, business never became the same, Kampala was full of instability, people could no longer come to buy mainly the retailers from Masaka, Luwero, Jinja whom I would supply….the business survived for the first year of the war but in the second year, I could no longer survive in the business…I couldn't even manage the rent in Wandegeya where I used to stay and this forced me to shift to Bwaise. When I reached Bwaise, the only way to survive was to resort into cultivation of the swamp to produce yams to which up to now, I have sold and educated my children…*[13]

Another account although of a different version was given by a widow staying in Kinawataka and growing crops mainly sugar-cane and potatoes from the wetland areas attribute her encroachment on the wetland to the NRA bush war. In an in-depth interaction with her, she argued that;

> *My husband was a soldier and the sole breadwinner at home, however, when they went for the mission to fight against the NRA rebels in 1984, he was killed….I was chased out of the Mbuya barracks and I had nowhere to go with the children…although I had acquired a small piece of land for settlement in the uplands of Kinawataka, I had no source of income and therefore, decided to encroach on the Kinawataka wetland for*

[11]MAAIF and MFPED.(2000) Plan for Modernization of Agriculture (PMA): Eradicating Poverty in Uganda, "Government strategy and operational framework", Ministry of Agriculture, Animal Industry and Fisheries & Ministry of Finance Planning and Economic Development. Kampala, Uganda.
[12]Ssebaana K. J. (2002) Key food security issues /challenges in Kampala city. World Banks Food Security Initiative on feeding cities in the Horn of Africa work- shop. Addis Ababa Ethiopia.
[13] In-depth interview with a resident at Bwaise

cultivation…I set up my sugar-cane plantation and sweet potatoes of which I have cultivated since 1984…[14]

Such and more accounts reveal the way the Bush war pushed people in Kampala out of other economic activities and comfortable life-styles into agrarian practices and yet the only remaining isolated land were the wetlands that they encroached on for survival.

However, the post-bush war era of the 1986 to 1995 characterized by restoration of peace and security that allowed continued migration and settlement of people from different parts of the country into areas surrounding various wetlands in Kampala. It is also noted that such migration and settlements took place without any guidelines on settlements, and later on how to use wetlands for agrarian and other practices. Such settlements and absence of legal frame works in this period opened room for increased growth of gardens in wetlands that has in the long run transformed these areas from subsistence farming to commercial farming on a larger scale mainly in Lubigi after the waste treatment plant as you are heading to Bwaise.[15] This is why Kinawataka, Lubigi and Luzira wetlands begun to experience wide cultivation, reduction in water levels and introduction of new crops such as rice that largely drain the wetlands.

The year 1995 witnessed the introduction of clear legal frameworks such as the constitution and the establishment of the National Environment Management Authority (NEMA) as a semi-autonomous institution in charge of protecting and preserving wetlands.[16] The increase in urban population and demand for agrarian products for domestic and commercial basis just fuelled the

[14] In-depth interview with a resident at Kinawataka
[15]Slade G, Weitz K. (1991) Uganda Environmental Issues and Options [Unpublished Master's thesis]. Durham, North Carolina: Duke University.
[16] Taban, W. O. (2012). The role of NEMA in the protection of the environment in Uganda.

utilization of Kinawataka, Lubigi and Luzira wetlands in Kampala.[17] It should be noted that despite the efforts by NEMA to evict people from wetlands, the increase in population and demand for agricultural products in Kampala have posed a serious challenge.

In 2016, it was discovered that the National Environment Management Authority cut down crops in Lubigi Wetland, north-west of Kampala, as a move to stop encroachment and save wetlands from de-gradation.[18]However, the current situation in Lubigi wetland is that people have increasingly settled in and established new gardens of crops like yams, vegetables and banana on a more extensive basis so as to meet the market demands of food in Kampala.

The rapid growth in demand for food resulting from high urban population growth and inflationary pressures on food, fuel and other basic commodity prices has made access to food in Kampala a pressing concern.[19]According to Bahiigwa, the Government of Uganda launched its Plan for Modernization of Agriculture (PMA) as a holistic framework with the mission of eradicating poverty by transforming subsistence agriculture to commercial agriculture.[20]Through this plan government focus was on agricultural development in rural areas with the view that the expanding urban population would stimulate its growth.[21] However, this did not work out as expected and to the contrary, farmers in Kampala realised that agriculture needs to be commercialised and they

[17]Tindifa SB. (2001) Peace, Conflict and Sustainable Development: The Experience in Uganda. Paper presented at the ‘‘Sustainable Development Governance and Globalisation: An African Forum for Strategic Thinking.
[18]The daily monitor of Friday, March 18, 2016
[19]United Nations Environment Programme (UNEP). (2014) Assessing Urban and Peri-urban Agriculture in Kampala, Uganda.
[20]Bahiigwa, G., Rigby,D.,& Woodhouse, P. (2005).Right target, wrong mechanism? Agricultural modernization and poverty reduction in Uganda.
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[21]International Bank for Reconstruction and Development/World Bank. Promoting Green Urban Development in African Cities Kampala, Uganda: 2015.

shifted from subsistence to large scale commercial production of crops within the wetlands. This was the reality on ground in the wetlands of Lubigi where people living in areas of Jenimah-Kyebando road, Lubigi-Nabweru road and areas of Bwaise have engaged in extensive cultivation of the wetland for Yams and vegetables.

The current growth of urban population has increased considerably the pressure on the natural resources in Kampala region. As such, there have been an increasing number of vulnerable households who have turned to urban agrarian activities as an alternative source of food, as a means of saving on food expenditure, and as a way of generating cash income.[22] As noted in the previous discussions, urban agriculture was mainly a survival strategy of the poorest of the urban poor, but increasingly farming activities have gained importance among the urban poor, and among a significant proportion of low- and medium-income earners.[23] Kampala city has a population of about 1.5 million inhabitants, nearly 14% of the total Ugandan population.[24] Of the Kampala inhabitants, 40% consume either a crop or animal product produced in the city, while 70% of all poultry products consumed are produced within the city mainly in wetland areas because that's where there is space. Women and children are primarily involved in urban agriculture in Kampala, which includes farm chores like weeding, planting and harvesting. In contrast, men prefer quick income generating projects. A small proportion of urban agricultural produce is intended for sale, while the majority of it is for home consumption.[25]

[22]Elly N.Sabiti, Constantine B.Katongole,etal(2014).Assessing Urban and Peri urban Agriculture in Kampala, Uganda.Nov.
[23]Maxwell, D. G.(1995). Alternative food security strategy: A household analysis of urban agriculture in Kampala. *World Development*, *23*(10), 1669-1681.
[24]Porter, R. I. (2001). Questioning de Soto: the case of Uganda. *Philippine Journal of Development*, *28*(2), 205-233.
[25]16. Matagi S.V. (2002) .Some issues of environment concern in Kampala, the city of Uganda .Environmental monitoring and assessment.

4.2.2 Easy Accessibility to Urban Wetlands for Agrarian Practices in Kampala

Before colonialism, access to wetlands for agriculture was through customary means. However, the scramble for African resources during colonialism was linked to industrial revolution in Europe in 17th Century. It subsequently led to promotion of slave trade which was the turning point that set in the current economic strife characterised by rural-urban migration and the accessibility of urban wetlands for agrarian practices.[26]It is on this basis that this section explains the fact that agrarian evolution in wetlands of Kampala was exacerbated by easy accessibility to these wetlands by the peri-urban population as analysed below.

During interaction with residents in Luzira, it was established that agrarian practices in Kampala wetlands have over time been facilitated by the accessibility of land through formal and informal means. Informally, urban land for agrarian activities can easily be accessed through different forms such as squatting, borrowing, inheriting or renting and co-owning with spouse and these can be transformed into formalities.[27] These informal means mainly take place in wetlands and slummy areas of Kampala. On the other hand, formal procedures for accessing land in Kampala are highly bureaucratic, time-consuming and complex. At times, urban farmers who generally lack the knowledge, information and contacts to file an application for acquiring land are intimidated.[28] Therefore, many of the peri-urban poor find it convenient to settle and later utilise wetlands for agricultural activities. A case in this point, are the urban farmers around Nabweru road carrying out agriculture from Lubigi wetland who unanimously argued that it is hard toaccess and own land

[26]Maxwell D and ZiwaS.(1992).Urban farming in Africa; The case study of Kampala, Uganda. ACTS. Press, Africa, center of Technological studies.
[27]Bauer, D. and I. Wing.(2010) Economic consequences of pollinator declines: a synthesis. Agricultural and Resource Economics.
[28]Sabiiti, E.N., Bareeba, F, etal.(2005)Urban market garbage. A resource for sustainable crop/ livestock production system and the environment in Uganda. A paper presented at the international conference. Wastes-The Social Context. Edmonton, Canada.

from the uplands due to the complex procedures and rigid formalities to be managed by peasants. Therefore, their option is the wetlands.

The 1900 Buganda Agreement which was put to effect by the imperial regime alienated water bodies, game parks, mountain regions and mineral-rich areas on the Crown land. The British used the above law to put the resources under direct control of the Crown. Despite its implementation, the wetlands remained accessible for farming which was the major economic activity save for those which fell within specific protected areas such as forest reserves, National Parks and Game reserves, others which did not receive the special protection of the state were encroached upon for human survival. The struggles for these areas by peri-urban farmers, has made them carry out agricultural activities such as growing crops and rearing of animals.[29]Such farmers acquired leaseholds upon these wetlands such as Kinawataka, Lubigi and Luzira. This has increased the conversion of such holdings to extensive commercial agrarian practices by establishing fish ponds, large scale cocoyam and rice gardens in Luzira and Lubigi wetlands, large sugarcane, fish ponds and rice farms in Kinawataka wetland.[30].

The system of land tenure had land divided into Mailo (from the English word mile) as private land belonging to the King of Buganda (Kabaka) and chiefs and public (crown) land owned by the Queen of England.[31] Most urban poor settlements and activities are on Mailo, a form of freehold where individuals control access, irrespective of their capacity to develop the land. Majority of the poor gain their access to land as customary tenants on privately owned land in peri-urban areas, a

[29]Mascia,M. B., & Pailler,S. (2011).Protected area downgrading, downsizing, and de-gazettement (PADDD) and its conservation implications. *Conservation letters*, *4*(1), 9-20.
[30]International Bank for Reconstruction and Development/World Bank.(2015) Promoting Green Urban Development in African Cities Kampala, Uganda;
[31]United Nations Environment Programme (UNEP). (2014) Assessing Urban and Peri-urban Agriculture in Kampala, Uganda.

form of land tenure unique to Buganda known as bibanja (plots) on Mailo land.[32]These forms of land tenure are very unreliable and insecure for a seasonal peasant and his or her crops which push many of them to wetlands for they think it is more secure. It was argued by a participant that;

> *I would rather cultivate in a swamp to which no one will claim ownership than cultivating my rice and sweat potatoes on a rented land where they can chase me anytime…for the wetland, the government targets chasing only those along the road areas mainly the other side of Lubigi, Namungona near Hoima road or By-pass…for us who are operating our gardens inside this side, we are safe and free…it is better than buying the Mailo Kibanja where the owner can sell you off at his own wish…*[33]

The form of customary land ownership in the urban centre has recently been criticized by gender and environmental activists as not clearly defined and that it renders women vulnerable to deprivation of access to land. In addition, the land is segmented into smaller plots of land that deters sustainable investments. The archaic system from the pre-colonial period confined land ownership rights to the monarchical leadership of Buganda.[34]

As earlier argued, in 1928 most of the peasants in Kampala begun accessing wetlands through the Busuulu (ground rent) and Envujjo (tribute) Law. Through this law, there was land tenure security for tenant cultivators that their plots of land were safe for as long as they settled a certain fee before the Mailo holder.[35] As a result, many people settled around Kinawataka, Lubigi and Luzira wetlands and utilised them for agriculture.

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[32]Nyakaana, J. B., H. Sengendo, etal.2004) Urban Development, Population and the Environment in Uganda: The. Case of Kampala City and its Environs.
[33]In-depth interview with a resident of Lubigi
[34]Opcit Nyakana J. B, H. Sengendo, etal
[35]Lwasa, S.(2004). Urban Expansion Processes of Kampala in Uganda: Perspectives on contrasts with cities of developed countries. Urban Expansion: The Environmental and Health Dimensions, Cyber seminar, Population-Environment Research Network (PERN).

In an account given during an oral interview with an elderly in Kinawataka, it was established that the instabilities between 1979 and 1986 made many people to flee from the organized uplands in Kampala and opted to hide themselves around wetlands for safety. A 78-year-old lady argued that"

> *Due to fear of death by the gun, many of us and our families ran into hiding and the safest places were the wetlands with relative bushes to hide in…in the hideouts, we could only survive by growing crops…after the war, most of us remained in these areas as no one would claim ownership of these areas.*[36]

By1988, Uganda acceded to the Ramsar Convention in which the government was under an obligation to implement policies safeguarding the wetlands and this made it slightly hard for people to have access to ownership and use of wetlands for agrarian practices than before. This was reflected in the 1995 Uganda constitution under Article 237(2) (b) in which government recognized the conservation of wetlands and it remains the Trustee of this resource.[37] However, this Constitutional provision in the 1995 Uganda constitution did not take care of the ownership matters especially those pertaining to Mailo land owners in Buganda region and for those settling in wetlands.[38] Government tried to implement this constitutional provision through enforcement of the land use activities in wetlands on Mailo land owners but this has since 1995 not stopped people from encroaching and utilising wetlands in Kampala for agrarian activities. Therefore, the easiness in accessing wetlands by Ugandans in Kampala made them believe that the best alternative was to utilise wetlands for agriculture other than the uplands.

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[36] In-depth interview with a 78-year-old lady in Kinawataka

[37]Katongole, C. B, Nambi Kasozi, etal.(2012) Strategies for cropping with feed scarcity among urban and peri urban farmers in Kampala, Uganda. *Journal of Agriculture and Rural Development in the Tropics and sub Tropics.*

[38]Lyon B and D.G Dewitt.(2012)A recent and abrupt decline in East African long rains .*Geographical research centers.*

4.4 Change in Eco-Culture

Eco-culture is an emerging focal concept reflecting the inextricability of nature and culture. Eco-culture is the inter-play between human culture and the environment that it exists in including but not limited to the challenges of regaining and retaining this connection through means such as sustainable development.[39] Before colonialism, people in Kampala had totems attached to clans and other social practices such as birth, marriage and death rights that were connected to their physical environmental eco-system mainly the wetlands. The language of destruction of nature; was unheard of in the traditional society. The techniques for conservation were simple but effective. For example, hunting, fishing, cultivation, using simple tools that mainly produced food for consumption but most importantly wastage which could result in the destruction of natural resources was avoided.[40] This implies that such norms and customs compelled people to preserve and conserve wetlands by refraining from any activity that would go against conservation norms in wetlands.

The traditional system among the Baganda in Kampala preserved resources through the meaning they attached to the wetlands as a natural resource and this guided the way they utilised these wetlands.[41] For example, there was strict preservation and conservation of specific animals and trees used for medicine while using these wetlands. Therefore, encroachment on wetlands for cultivation was minimal as compared to the days of colonial and post-colonial era. Besides, each clan was represented by a totem, a symbol from the natural environment to which most of them

[39]Ibid
[40]Lyon B and D.G Dewitt.(2012)A recent and abrupt decline in East African long rains .*Geographical research centers.*
[41]Lwasa .S.(2010) Adopting Urban areas in Africa to climate; a case study Kampala current opinion in Environment Sustainability.

would survive in wetlands and whoever was cultivating in there had an obligation to protect the flora and fauna through selective use of trees, fish and wild or reared animals.

It was a systematic way of rationing of their use for food and others. In addition, animal rearing had both social and economic benefits.[42] The practice of payment of dowry re-inforced animal conservation. The culture of food preservation fore-casting future uncertainties ensured that every household had a food store (granary) that played an important role in promoting freedom from hunger, malnutrition among family members. This was outstandingly complimented by the Ganda culture of solidarity expressed in shared life or African communism.[43]

Indeed, the Baganda community had rich cultural beliefs with significant ecological inclination. Sacredness of the geophysical order was expressed in naming of natural assets such as lakes, mountains, wetlands and forests for example Nalubaale (Victoria) after Ganda god Lubaale who was traditionally believed to be among the greatest deity in their history. "Nakivubo" in Ganda language refers to a fishing area. Nakivubo wetland was as the name depicts endowed with fish.[44]

Indeed, in the current establishment, the Luzira wetland that is connected to Nakivubo hosts most of the fishing activities that in modern context, fish ponds take priority among the key activities taking place with different fish species including catfish and lungfish which were 'easy meal' for the natives.[45]

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[42]Ibid
[43]Taylor, E. C. (2016). *Asians and Africans in Ugandan Urban Life, 1959-1972* (Doctoral dissertation).
[44]Ibid
[45]Kansiime, F., &Nalubega, M. (2020). Socio-economics of the Nakivubo swamp. In *Wastewater Treatment by a Natural Wetland: The Nakivubo Swamp, Uganda* (pp. 265-281). CRC Press.

In a similar manner, Lubigi, Luzira and Kinawataka wetland-lake inter-face has been found by Kampala dwellers as famous breeding ground for fish, especially Nile tilapia which supplements other foods like cassava, matooke, among others grown in wetlands. This, therefore, means that fish is simply considered in passing but the alarming activity taking place in Lubigi, Luzira and Kinawataka wetlands in Kampala.

However, due to decline in African culture and adoption of modernity; wetlands have been encroached on for agrarian activities since many have taken leave of their culture as others also believe that since they do not belong to Buganda, they are less concerned with the cultural attachments of the Baganda. For instance, in an interview with a resident of Acholi quarters whom I found cultivating from Kinawataka wetland, argued that;

> *I know very less about what the Baganda believe as regards to conservation and use of the wetland…one day I was told that Baganda used to prohibit people from planting simsim in the wetland areas because of certain reasons…and actually, most of the Baganda do not plant certain crops in the wetlands…but now my man, I am an Acholi, what I know best is growing* simsim *and groundnuts that I use to prepare odi paste for selling and I educate my children…I have done it since the early 1980sup to-date, I have not faced any calamity that Baganda say…*[46]

There has been continuity in the un-sustainable use of wetlands due to eroded cultural affiliation among the people of Kampala that with the increased pollution in the wetlands, natural fishing has dwindled and is currently among the least of wetland's products and has been replaced by modern fish farming through ponds and cages which have evolved.[47]Such fish farming practices are

[46]In-depth interview with a 65 Year old peasant in Kinawataka, a resident of Acholi Quarters
[47]Ibid Kansiime & Nalubega

supported by methods that also encroach on wetland products for making fish traps, hand crafts such as baskets, mats and other ornaments for socio-cultural ceremonies.

Without clear integration of cultural values into environmental use by man, urban dweller in Kampala will continuously encroach on the wetlands for exploitation through agrarian activities. Therefore, there is need for an integrated management strategy for wetlands that needs to be adopted, taking into account all stakeholders involved in raising awareness on conservation of wetlands as a means of adaptation against hazards. This could be done at institutional and individual level with the help of educational institutions, Non-Government Organisations, Community Based Organisations, Religious and Cultural intuitions that protect peoples' beliefs and values country wide.

Therefore, as time evolved, Kampala became metropolis and heterogeneous that a lot of eco-cultural diffusion took place and much of the traditional conservation norms, beliefs and values got diluted and weak. Whereas the elders in Buganda try to adhere to the traditional values of wetland conservation, the contemporary generation is totally distorted and focusing much on wealth accumulation in more un-sustainable ways. In the end, most parts of wetlands are being converted into agricultural farms without minding about the cultural demands of preserving the eco-system.

4.5 Effect of Industrialisation and Urbanisation

Before colonialism, industrialisation and urbanisation had not felt serious impact on the agrarian evolution in Swamps in Kampala. However, following the scramble and partition of Africa in 1885 and the taking over of Uganda as a British protectorate on 29th May 1893, the British government

introduced land changes that led to the growth of industrialisation and urbanisation to be felt by Kampala wetlands.[48]

Due to the desire for geo-processing products from Uganda for British industries, the British had by 1900 already established administrative units on most of the hills in Kampala and had occupied most of the uplands for cash crop production to supply their cotton and coffee industries.[49] By 1920, elements of urbanisation had begun getting rooted in Kampala that most of the people were having limited or no space for food production other than the wetlands.[50]

By 1928, as a result of the Busuulu (ground rent) and Envujjo (tribute) Law that assured tenants of their tenure safety in the plots of land that they had acquired including wetlands, most of the people who settled around wetlands begun small scale businesses of selling their agrarian products from the wetlands in markets.[51]The Law helped in promoting tenure security of plot tenants mainly in Kampala.[52] This policy encouraged many tenants who had occupied land in wetlands to establish permanent agrarian projects with less fear of unfair evictions by the landlords.

With the 1900 Buganda agreement that did not favour the urban peasant dwellers in Kampala over the issue of tenant security, most of the peasants in Kampala found it very hard to settle in the uplands with the growing rates of urbanisation and industrialisation and they resorted into

[48]Omolo-Okalebo,F.(2011). *The Evolution of Town Planning Ideas, Plans and their Implementation in Kampala City 1903-2004* (Doctoral dissertation, KTH Royal Institute of Technology)
[49]Obwona, M., Shinyekwa, I., Kiiza, J., & Hisali, E.(2014).The evolution of industry in Uganda.
[50]Dugan, P., & Dungan, P. J.(Eds.). (1990). Wetland conservation: A review of current issues and required action.
[51]Alli, L. (2019). *The extent to which land amendment act 2010 affect land tenure system in Uganda* (Doctoral dissertation, Kampala International University, School of Law).
[52]Place, F., & Otsuka, K.(2002).Land tenure systems and their impacts on agricultural investments and productivity in Uganda. *Journal of Development Studies*, *38*(6), 105-128.

settlement in wetlands and utilised them for agriculture.[53] Such trends guided the settlement and utilization of wetlands due to fear of insecurity in the uplands that had been taken over by industries and urban settlement that by 1950, Kampala had transformed into an urban area and industries were beginning to crop up mainly in the agro-processing sector.[54]

Furthermore, after independence, from 1962 up to 1969 witnessed rapid increase in industrialisation geared by the Indian community in Uganda.[55]These industries occupied almost all the major spaces of land in the uplands of Kampala and left only wetlands and other low-lands for most of the Ugandans in Kampala to occupy.[56] This pushed many of the Ugandans to wetlands that as they settled around them, they also ended up engaging in agricultural practices for subsistence purposes. However, as the population increased in Kampala that had come to work in the established industries and trade purposes, there was an increase in demand for food between 1962 and 1970 which exerted more pressure of demand for food crops that were being produced from the wetlands of Lubigi, Luzira and Kinawataka.[57] By 1970, the selling of cocoyam in Bwaise market grown in Lubigi Swamp was prominent, Luzira and Kitintale markets were known for the sale of fish and sugar-cane from Luzira wetland while most of the markets around Nakawa, Kireka, Bweyogerere and Namboole were known for selling cocoyam, sweat potatoes and sugar-cane grown from Kinawataka wetlands.[58]

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[53]Olanya, D. R.(2014).Asian capitalism, primitive accumulation, and the new enclosures in Uganda. *African Identities*, *12*(1), 76-93.
[54]Obwona, M., Shinyekwa, I., Kiiza, J., & Hisali, E.(2014). The evolution of industry in Uganda.
[55]Kiiza, J. (2006). *Institutions and economic performance in Africa: a comparative analysis of Mauritius, Botswana and Uganda* (No. 2006/73). WIDER Research Paper.
[56]Dugan, P., & Dungan, P. J.(Eds.). (1990). Wetland conservation: A review of current issues and required action.
[57]Ibid
[58]Dugan, P., & Dungan, P. J.(Eds.). (1990). Wetland conservation: A review of current issues and required action.

With the anti-Asian policies of President Idi Amin between 1972 and 1979, the industrial base of Kampala suffered a setback because Ugandans lacked the expertise in managing the industries and the shops, they inherited from the Asians. Many lost employment opportunities and resorted into agriculture which would only be favourable in wetlands. Industrialisation was further retarded by the bush war between 1981 and 1986 that the levels of insecurity in Kampala reduced urban based economic activities thus pushing many of the Kampala dwellers into wetlands for agriculture.[59]For instance, a 50 year old female participant from Luzira argued that;

> *Before the bush war, my family had a grocery operating around old tax park from which my father would derive a living, however between 1981 and 1986, the grocery collapsed because there were no suppliers of commodities and even buyers were very few…even our life was in danger operating in the middle of the town, my parents decided to re-locate to Kitintale where they established themselves and from there, we got access to cheap land in both Luzira and Kinawataka but both were wetlands from where we have grown vegetables and root tubers to supply to Kitintale market since the 1980s…personally I am married here in Luzira where my home is but still you see that part of this land is in the wetland and I use it for agriculture…but it all begun with the war because we used to stay within the upland areas of Kampala.*[60]

However, the peace that came after the war in 1986 contributed to rapid urban development in Kampala coupled with industrial revival that most of the Kampala dwellers resumed working in industries and the urban population increased again.[61] The resumption of industrial works and rapid increase in population in Kampala between 1986 and 1995 increased the need for agricultural

[59]Ibid

[60]In-depth interview with a 5o year old female participant in Luzira

[61]Good fellow, T.(2013). Urban planning in Africa and the politics of implementation: contrasting patterns of state intervention in Kampala and Kigali. *Living the City in Africa: Processes of Invention and Intervention. Berlin: LIT Verlag*.

products for food and raw materials for industries.[62] These urban and industrial demands made many urban dwellers to run to wetlands for extensive agriculture in Lubigi, Luzira and Kinawataka wetlands. This implies that the peace that was celebrated in 1986 did not improve the situation in terms of conserving the wetlands but just worsened the situation as there were more people that encroached on the wetlands than even those who did so during the war.

To try and deal with the rapid urbanisation and industrialisation , the government of Uganda came up with strict regulatory legal and institutional frameworks such as the 1995 Uganda constitution and the 1995 NEMA Act for regulating the encroachment on wetlands.[63] However, all these did not properly provide a legal framework to regulate urban agrarian activities in Kampala. At the same time, its planners and national policy makers have recently recognized the central role of urban agriculture in the wider urban economy making it difficult to completely stop farming in wetlands. For example, in 1994, a section known as the Urban Agriculture Unit was established within Kampala City Council's (KCC) Production and Marketing Department.[64]Formerly, before de-centralisation of Kampala District, this was directly under the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). The broad objective of this Unit was to support and guide the communities in urban agrarian activities and to ensure household nutrition and food security. As such, the activities of this unit brought in a number of improvements in urban agriculture such as training of farmers in various crop and animal husbandry skills, and in domestic garbage

[62]Joughin, J., & Kjær, A. M.(2010, March). The politics of agricultural policy reform: the case of Uganda. In *Forum for development studies* (Vol. 37, No. 1, pp. 61-78). Routledge.
[63] Isunju, J. B., & Kemp, J.(2016). Spatiotemporal analysis of encroachment on wetlands: a case of Nakivubo wetland in Kampala, Uganda. *Environmental monitoring and assessment*, *188*,
[64]Kiguli, L. N., Nuwagaba, A., Mwesigwa, D., & Kiguli, J.(2003).Access to land for urban agriculture in Kampala.

management and re-use in urban agriculture. All these played a major role in the growth of agrarian activities in most of the Kampala wetlands.

Since November 2000, Kampala city authorities, researchers and donors have been working together to address the challenges of urban agriculture under the Urban Harvest Programme, led by the International Institute for Tropical Agriculture (IITA), which investigates urban agriculture in the livelihood strategies of the urban poor.[65]. A related Health Impact Assessment of urban agriculture in Kampala was under-taken by a Health Co-ordinating Committee (HCC), established in June 2002, with active involvement of Kampala City Council (KCC).[66] There is an active link between research and policy making. KCC has accordingly legislated urban agriculture in Kampala City (Urban Agriculture Ordinance 2001). The ordinance provides for the licensing, control and regulation of crop farming and animal rearing in the city.[67] This has as well boosted agrarian activities in the wetlands of Lubigi, Kinawataka and Luzira.

Industrialisation and urbanisation of Kampala have greatly boosted the expansion of agrarian activities in wetlands in Kampala. A development that has been accompanied with several challenges including various policies and players in both government and NGOs. However, there is still need to come up with a more pragmatic, multispectral and comprehensive strategy for conserving wetlands in Kampala amidst agrarian activities.

[65]Ibid
[66]Cole, D., Lee-Smith, D.,& Nasinyama, G. (Eds.). (2008). *Healthy city harvests: Generating evidence to guide policy on urban agriculture*. International Potato Center.
[67]Ibid

4.6. Urban Policies and Regulations

Urban policy refers to the cluster of policies that are aimed at influencing the development of urban areas and urban lives.[68] It could be fragmented and diverse in practice due to the fragility of social needs and political institutions including those aimed at management of urban land use such as agrarian practices in urban wetlands. Before colonialism, most of the policies and regulations governing land around Kampala were emanating from the traditional norms and values that had created customary land tenure system.[69] Therefore, the pre-colonial policies and regulations on wetlands were guided by the set of customary system that although wetlands would be accessed by people in Kampala, conservation was a norm.[70]

It ought to be noted that most of the written and formally communicated policies and regulations on wetland access and use were witnessed during colonialism. One of the urban policies and regulations that governed the access to urban wetlands and their use for agrarian practices was the Buganda Agreement of 1900.[71] Through this agreement, Britain took over all the natural resources in Buganda and Kampala in particular. The 1900 Buganda Agreement vested wetlands within about 9,000 square miles under colonial control and according to the British laws, wetlands had

[68]Evans, G. (2009). Creative cities, creative spaces and urban policy. *Urban studies*, *46*(5-6), 1003-1040.

[69] Mabikke, S. B. (2016). Historical continuum of land rights in Uganda: a review of land tenure systems and approaches for improving tenure security. *Journal of Land and Rural Studies*, *4*(2), 153-171.

[70]Ntambirweki, J. (1998). The evolution of policy and legislation on wetlands in Uganda. *Case study prepared for the technical consultation on designing methodologies to review laws and institutions relevant to wetlands. Switzerland*.

[71]Radoki, C.(2006). Social agency and state authority in land delivery processes in African cities: Compliance, conflict and cooperation. *International Development Planning Review*, *28*(2).

been categorised under the uncultivated land.[72] By 1902, the British emphasised individual tenure and ownership of land including wetlands.

However, the British colonial government established the Crown Lands Ordinance of 1903with Freeholds, Lease holds and Mailo tenure systems to allow indigenous Ugandans a right to occupy land.[73] However, the ordinance did not grant the Kampala dwellers a right to access land in freehold or leasehold without prior license or consent in accordance with their customary law thus, many found themselves landless and later opted to wetlands as an alternative for growing crops.

In 1930, the British colonial government made a policy that targeted the draining of swamps in Kampala to fight against malaria and this made Nakivubo-Luzira wetlands to be drained through the construction of the Nakivubo channel between 1930 and 1939.[74]This policy rendered wetlands in Kampala accessible by people because water had reduced and in the long run, they ended up utilising them for agriculture. Indeed, historical accounts establish that after the construction of Nakivubo-Luzira channel, even nearby wetlands like Kinawataka experienced reduction in water levels and people encroached on them for both settlement and cultivation of sugar-cane, cocoyam, sweat potatoes and banana leading to the documentation of the different stages in the agrarian evolution in these areas.[75]

[72] Nkurunziza, E. (2006). Two states, one city?: Conflict and accommodation in land delivery in Kampala, Uganda. *International Development Planning Review*, *28*(2).
[73]Krishnamurthy, B. S.(1964). *Land and Labour in Nyasaland 1891-1914*. University of London, School of Oriental and African Studies (United Kingdom).
[74]Omolo-Okalebo, F.(2011).*The Evolution of Town Planning Ideas, Plans and their Implementation in Kampala City 1903-2004* (Doctoral dissertation, KTH Royal Institute of Technology).
[75]Emerton, L., Iyango, L., Luwum, P., & Malinga, A.(1998).The present economic value of Nakivubo urban wetland, Uganda. *Nairobi: IUCN*, 228-233.

Furthermore, a number of urban planning policies in form of schemes were introduced by the British colonial government through what was referred to as modern urban planning scheme for Kampala in 1951, covering Nakasero and Old Kampala hills and wetlands.[76] The policy demarcated upland areas for industrial development, settlement and infrastructure leaving peasants with no choice but utilising Kinawataka, Lubigi and Luzira wetlands for agriculture despite the fact that even during colonial era, wetland agrarian practice was not openly accepted.

The 1964 Town Planning Act mandated the Local Urban Authorities to enforce regulations for 'development control' in their areas of jurisdiction. In earlier years this Act provided the basis for Kampala City enforcement officials to stop those who carried out urban farming in the city, since the Act views farming as an activity at odds with the urban standards.[77] In Uganda, the Plan for Modernisation of Agriculture (PMA) focuses solely on rural agriculture. However, the government lacked resources to provide enough extension services for this programme.[78] This therefore left the urban dwellers in Kampala less informed about the dangers of encroaching on the wetlands for agriculture thus, making them engage in agrarian practices in Kampala wetlands without any proper direction from government. This has in turn led to unplanned make shift farms that have characterised the wetlands of Lubigi, Kinawataka and Luzira.

[76]Omolo-Okalebo,F.(2011). *The Evolution of Town Planning Ideas, Plans and their Implementation in Kampala City 1903-2004* (Doctoral dissertation, KTH Royal Institute of Technology).
[77] Kiggundu, A. T. (2014). Constraints to urban planning and management of secondary towns in Uganda. *Indonesian Journal of Geography*, *46*(1), 12-21.
[78]Bahiigwa, G., Rigby, D., & Woodhouse, P.(2005).Right target, wrong mechanism? Agricultural modernization and poverty reduction in Uganda. *World Development*, *33*(3), 481-496.

In 1986 the government declared some wetland use activities illegal until a clear law was to be instituted which came in 1995.[79] However, the government specifically abolished activities that would result into large-scale wetland drainage such as rice cultivation but this did not stop Kampala dwellers who were conducting agrarian practices to which they claimed not to be leading to large scale water drainage. As a result, a large area of wetland has been encroached at the watch of government.

In 1995, legal frameworks were instituted as the 1995 Uganda Constitution of the Republic of Uganda was promulgated. This provided for the enacting of the law that would establish the National Environment Management Authority (NEMA) which was done in 1995. It ought to be noted that Section 38 of the National Environment Act, 1995 Constitution empowers NEMA to manage the activities conducted in wetlands.[80] Whereas enforcement of environment regulations, including those on management of wetlands is expected to be done through a hierarchy of enforcement levels from national (NEMA and Wetlands Management Department), District, down to community levels, the enforcement capacity available (in terms of number of personnel, financial resources, among others) at all these levels appears not to be able to match the widespread nature of the problem of wetland abuse.[81] In addition, while the responsibility for wetlands management has been vested under the local authorities, intervention on wetlands management has not produced desirable results as wetland law enforcement and intervention officers from time-

[79]Hartter, J., & Ryan, S. J. (2010). Top-down or bottom-up?: Decentralization, natural resource management, and usufruct rights in the forests and wetlands of western Uganda. *Land Use Policy*, *27*(3), 815-826.

[80] Nakito, A. (2018). *An appraisal of the national environment management authority (NEMA) in preserving Uganda's wetlands in Kampala district* (Doctoral dissertation, Kampala International University, School of Law).

[81]Matovu, G. L. (2006, March).The Challenges in Monitoring and Enforcement of Environmental Laws in Uganda. In *A Paper Presented at a Training Workshop to strengthen and enhance the Capacity of Police Investigators and state prosecutors to enforce environmental laws*.

to-time face resistance from un-cooperative political leaders and the community involved in agrarian activities on wetlands.[82] For instance, on 6th and 7th June 2018, there was chaos in Lubigi as environmental police and NEMA Personell were trying to evict wetland encroachers who were resisting eviction Kampala.[83]These efforts by NEMA have saved part of the wetland area in Lubigi as there are currently no more agrarian activities taking place in the visible road side part. However, this has not been effected in the inner localities of Lubigi such as Nabweru road, Kyebando road and the side towards Bwaise where participants acknowledged that there are agrarian practices actively going on in wetlands.

Therefore, not until 1995, Uganda had no comprehensive wetland policy and one was desperately needed.[84] As a result, much of the population viewed wetlands as wastelands and little was done to protect them. Thus, the 1995 environmental regulations in the NEMA Act were over-due needed to create awareness surrounding wetlands and their value.[85]Despite most of these policies, encroachment on wetlands in Kampala has continued in a dis-organized waythat most of the farmers in these wetland areas become uncontrollable.

4.7 Population Growth

Before colonialism, Kampala was sparsely populated and most of the people used to settle around hills that make up Kampala and used the flat lands for agrarian practices.[86] This made them

[82]Were, A. N., Isabirye, M., Poesen, J.,Maertens, M., Deckers, J., & Mathijs, E. (2013). Decentralised governance of wetland resources in the Lake Victoria Basin of Uganda.
[83]Aggrey, M. (2011). Effectiveness of Environmental Institutions and Laws in the Protection of the Environment in Uganda: A case study of the 2009 Ban on the Polythene Bags (Kaveera).
[84] Gumm, E. (2011). The use and misuse of wetlands in Kampala.
[85] Nakito, A. (2018). *An appraisal of the national environment management authority (NEMA) in preserving Uganda's wetlands in Kampala district* (Doctoral dissertation, Kampala International University, School of Law).
[86] Hance, W. A. (1970). Some African Cities. In *Population, Migration, and Urbanization in Africa* (pp.298-382). Columbia University Press.

conserve the wetlands as per the guidance of their rituals and norms that wetland conservation had become a custom. However, with the coming of the British colonial administration, there was emerging population growth as the British and the Asians who had been brought to work on colonial infrastructural projects led to the beginning of urban population pressure.[87] The British colonial government took over most of the hills on which local Kampala dwellers had settled and established administrative units on them. The remaining flatlands where the natives would settle were turned into either industrial areas or institutions for social service delivery.[88] With this growing population pressure, a number of local Ugandans in Kampala remained with small pieces of land to conduct agriculture for food that at times would not be enough and this pushed most of them as time went on to begin some farming in the wetlands.[89]

Due to the population pressure from the different parts, British and mainly the Asians, the population of Kampala tripled from about 31, 500 by 1900 to 95,000 by 1951.[90] It is also indicated that the population in Kampala grew to 137,000 in 1960 with a growth rate of 9.60%. By independence time in 1962, the population was 167,000 at a growth rate of 10.60%.[91] This implies that by independence, a population of 167,000 could not have enough food supply and the

[87]Ittmann, K. (1999). The colonial office and the population question in the British Empire, 1918–62. *The Journal of Imperial and Commonwealth History*, *27*(3), 55-81.
[88] Omolo-Okalebo, F., Haas, T.,Werner, I. B., & Sengendo, H. (2010). Planning of Kampala city 1903—1962: the planning ideas, values, and their physical expression. *Journal of planning history*, *9*(3), 151-169.
[89]Ibid
[90] UN (2020) report on Kampala, Uganda Metro Area Population 1950-2022
[91]Ibid

increased demand for food made many native Ugandans in Kampala to utilise the wetlands for agriculture so as to produce for domestic and commercial purposes.[92]

After independence, there was sustainability of the population growth rate at an average of 8.09% between 1962 and 1972 with a population of 362,000people in Kampala. However, following the anti-Asian policies by President Idi Amin Dada, the population growth rate in Kampala was at an average of 3.18% between 1972 and 1979with a population of 451,000 people.[93]Although one would assume that the reduction in population growth may have led to the reduction in the speed of agrarian evolution in wetlands in Kampala, it is to the contrary.[94] Most of the Asian based businesses that Ugandans were working in to get survival in urban setting had collapsed and many Ugandans resorted to agriculture to which the only spaces that they would occupy were the wetlands mainly of Kinawataka, Lubigi and Luzira.[95]

Despite the political instabilities in the country between 1979 and 1986, there was an increase in the rate of population growth of 4.56% in that by 1986, Kampala had a population of 624,000 people.[96] In addition, with this increased population, most of the economic activities were not progressive and many Kampala dwellers joined agriculture mainly in wetlands for survival. Further, the political stability that came with the end of the bush war in 1986 came with a stable

[92] Rukundo, P. M., Iversen, P. O., Andreassen, B. A., Oshaug, A.,Kikafunda, J., & Rukooko, B. (2015). Perceptions on the right to adequate food after a major landslide disaster: a cross-sectional survey of two districts in Uganda. *BMC international health and human rights*, *15*, 1-15.
[93]UN (2020) report on Kampala, Uganda Metro Area Population 1950-2022
[94]Thomas, Y., Mutua, J., Waithaka, J., Kaggwa, R., Mbaisi, C., & Lyamchai, C. Policy Constraints facing Agricultural Development, Environmental Conservation and Poverty Reduction in East Africa.
[95]Schultheis, M. J. (1974). *Economics and Economic Research in Uganda during the Amin Period* (No. 641-2016-43473).
[96]Kuule, D. A. Ssentongo, B., Magaya, P. J., Mwesigwa, G. Y., Okurut, I. T., Nyombi, K., & Tabuti, J. R. S. (2022). Land use and land cover change dynamics and perceived drivers in Rangeland areas in central Uganda. *Land, 11*(9), 1402.

and steady increase in the percentage growth rate of the population in Kampala at an average of 5.0%between 1986 and 2010.[97]

By 2010, the population of Kampala was at 2,016,000 people. With political stability and increase in economic activities in Kampala, there has been growing pressure on the existing resources including wetlands. The population of 2,016,000 has been increasing the demand for food for consumption but also for supporting the agro-processing industries in Kampala.[98] This has, therefore, left no choice but for the wetlands of Kinawataka, Lubigi and Luzira to be turned into agrarian centres at a large scale. For instance, in areas of Mutungo, Bina, Kasseri Zone**,** Kamwanyi and others around Luzira, areas such as Nabweru, Jenimah, Kyebando, Bwaise and Namungona as well as areas of Banda, Acholi quarters, Nakawa, Mbuya and others have experienced high population growth and pressure that the rate at which this population is encroaching on the wetlands for agriculture is worrying.

4.8. Climate Change

The dynamic nature of climatic conditions coupled with long drought spells and unpredictable rains have pushed many agriculturalists to utilize the wetlands given their consistent nature water bases. Given the fact that Kampala has a bi-model rainfall pattern with peaks in March to May (long rains), September to November (short rains) while the rest of the months of June to August and December to February predominantly dry seasons. Rainfall in Kampala is average between 1200-1700mm per year.[99] Such climatic dynamics cannot sustain production of food on the

[97]Lamwaka, C. (2016). *The Raging Storm: A Reporters Inside Account of the Northern Uganda War, 1986-2005*. African Books Collective.
[98] Doshi, R. H., Apodaca, K., Ogwal, M., Bain, R., Amene, E., Kiyingi, H., & Hladik, W. (2019). Estimating the size of key populations in Kampala, Uganda: 3-source capture-recapture study. *JMIR public health and surveillance*, *5*(3), e12118.
[99] Gumm, E. (2011).The use and misuse of wetlands in Kampala.

uplands and the flatlands that can easily lose soil moisture in a short period of time.[100] Therefore, majority of the peasants and farmers have resorted into utilization of wetlands so as to sustain food production throughout the year.

In the Pre-colonial Kampala, historical accounts reveal that as by rituals, norms and belief systems that gave birth to customs, wetlands were thoroughly preserved alongside other natural resources like the lake, forests and hills as they were deemed to be hosting the spirits that would contribute enough rainfall throughout the year.[101] Such rainfall would support the growing of crops on uplands without any experiences of long droughts. Wetlands would by then be left for rituals and not for agrarian practices.

However, with the coming of the colonialists in the late 19th century, a number of things changed. The administrative and infrastructural projects by the colonial government tampered with the ecological system of Kampala that the vegetation on the major hills that would contribute to rainfall formation was destroyed to construct administrative units.[102] The growing rate of processing industries contributed to air and water pollution thus disrupting the ecology of rainfall formation.[103] The industrial materials like polyethene contributed to the pollution of the lithosphere

[100] Twinomuhangi, R., Sseviiri, H., Mulinde, C., Mukwaya, P. I., Nimusiima, A.,& Kato, A. M. (2021). Perceptions and vulnerability to climate change among the urban poor in Kampala City, Uganda. *Regional Environmental Change*, *21*, 1-13.

[101]Ramsar. National Wetland Policies: (2010) Developing and Implementing National Wetland Policies, Ramsar Convention Secretariat. The Republic of Uganda. 1995. The constitution of Uganda.

[102]Oloka-Onyango, J. (2017). Land injustice, impunity and state collapse in Uganda: causes, consequences and correctives. *Impunity and State Collapse in Uganda: Causes, Consequences and Correctives*.

[103]Banadda, E. N., Kansiime, F., Kigobe, M., Kizza, M., & Nhapi, I. (2009). Landuse-based nonpoint source pollution: a threat to water quality in Murchison Bay, Uganda. *Water Policy*, *11*(S1), 94-105.

that soils became infertile that could not produce enough food for the people of Kampala.[104] Therefore, with long droughts and infertile soils, Kampala residents began looking for an alternative by encroaching on wetlands for agrarian practices. After independence, nothing much was done to avert the situation that there were no clear policies to protect the environment from de-gradation that would lead to climate change. Despite the fact that by 1995, some laws had been put in place to protect the eco-system from activities that would lead to climate change, the threats have just worsened as Kampala experienced long dry seasons and unpredictable rainfalls that the only way for urban farmers to survive is through utilizing the wetlands for agrarian activities.

In addition, climate change is one of the major causes of drying up of wetlands as a result of reduced water tables giving way to change in land use such as cultivation and settlements. Since 1991, extreme weather events have become more frequent and climate change increased in frequency and severity.[105] The drying up of some wetlands in Kampala has accelerated wetlands of Kampala to evolve into agrarian centres for example, part of Lubigi wetland along Jenimah-Kyebando road dried up and this brought about numerous agrarian activities to be conducted on this wetland with the plantation of crops such as maize, yams, banana, among others.[106]

Between 1991 and 2000 Kampala experienced seven droughts in a period of ten years.[107] The later years have also witnessed an increase in intensities and frequency of heavy rains, floods, landslides

[104]Sorenson, J. R., Campbell, I. R., Tepper, L. B., & Lingg, R. D.(1974). Aluminum in the environment and human health. *Environmental Health Perspectives*, *8*, 3-95.
[105]Mengistou, S., Fetahi, T., Alamirew, T., Odong, R., & Ekwacu, S. (2021). Recent climate change in the Lake Kyoga Basin, Uganda: an analysis using short-term and long-term data with standardized precipitation and anomaly indexes. *Climate*, *9*(12), 179.
[106]Ibid
[107] Magezi, S. A. (2010). Climate change and sustainable housing in Uganda. In *Climate Change and Sustainable Urban Development in Africa and Asia* (pp. 153-166). Dordrecht: Springer Netherlands.

in the highland areas as well as outbreaks of water-borne diseases associated with the floods. Much of the city is located in the valleys between steeply sloped hills.[108] The topography combined with a tendency brief but heavy downpour of rainfall, drainage of swamps and other land-surface conversions, and blocked storm drainage systems create ideal conditions for flooding.[109] While the frequency of annual flooding has not increased over the past 20 years, there is severity of flooding in these areas. This has worsened due to increased urban growth, haphazard planning and over-taxed urban services and infrastructure.[110] Such conditions have accelerated the desire to convert wetlands to agrarian centres by the poor individuals in Kampala.

Empirical evidence generally point to the fact that farmers had knowledge of climate change through their observations of climate risks and how the magnitude of these has changed over time. The following climate risks were identified: changes in the timing and distribution of precipitation during the rainy seasons; changes in rainfall intensity and volume towards heavier rains; changes in rain coverage, which has now become more variable and warmer temperatures, especially at night.[111] The participants were of the view that during the 1970s through early 1980s, the rainy seasons were more regular and predictable. One of the participants also noted a change in cloudiness expressed as an imbalance between rain and sunshine as one of the respondents argued

[108]Nyenje, P. M., Ocoromac, D., Tumwesige, S., Ascott, M. J., Sorensen, J. P., Newell, A. J. & Foppen, J. W. (2022). Hydrogeology of an urban weathered basement aquifer in Kampala, Uganda. *Hydrogeology Journal*, *30*(5), 1469-1487.

[109] NEMA. (2003) Assessment Needs for Wetlands Inventory and Tools for Assessing, Mapping Wetland Types and their Distribution Report. Kampala, Uganda.

[110] Sabiiti, E. N., Katongole, C. B., Katuromunda, S., Sengendo, H., Basalirwa, C. P., Atukunda, G., & Nambuubi, S. K. (2014). Assessing urban and peri-urban agriculture in Kampala, Uganda. *Building Urban Resilience; Padhgam, J., Jabbour, J., Eds*.

[111]Thomas, D. S., Twyman, C., Osbahr, H., & Hewitson, B. (2007). Adaptation to climate change and variability: farmer responses to intra-seasonal precipitation trends in South Africa. *Climatic change*, *83*(3), 301-322.

that; “as soon as the rains stop, intensive sunshine follows”.[112]Due to the constant climate changes, farmers have found it hard to predict the rainy season and this has pushed them to the wetlands where water is constantly available[113]. For instance, a participant argued that;

> *In March, we prepare to plant because rains continue upto April in normal seasons with certainty and predictability of onset of rains... rains used to be heavy and regular and August–September rains would be abundant with some hail storms...November–December rains would be heavy with some hail storms however, there are changes due to increased climate unpredictability that are heavily felt these days... we were told that because we cleared the wetland covers in favour of agriculture although I am not so much aware…*[114]

However, the degree of vulnerability to climatic and other risks, which urban farmers are experiencing, may be increasing as a result of changes in other factors such as urban encroachment, environmental de-gradation, soil de-gradation, among others that lower the threshold of loss to heavy rainfall events, storm run-off and other effects associated with micro-scale weather events and larger-scale extreme events.

According to Mukasa, a resident of Jenimah, a suburb near Lubigi wetland, rains take long to fall and the temperatures are always high that the upland space they were using along Kyebando road could no longer support Peri-urban agriculture and as a result, most of them have encroached on Lubigi wetland spaces for crop cultivation.[115]

[112]In-depth interview with a 43 year old female participant from Kinawataka
[113] Magrath, J. (2008).Turning up the heat: Climate change and poverty in Uganda. *Oxfam Policy and Practice: Agriculture, Food and Land*, *8*(3), 96-125.
[114]In-depth interview with a participant from Luzira
[115]In-depth interview with a male resident of Jenimah, 2022

Therefore, the dynamics of climatic conditions have made it very hard for farmers in Kampala to conduct agrarian practices in the flatlands that could easily go dry and suffer from floods that can wash away their crops but rather the wetlands in which they can easily make drainage trenches to control the moving water.[116]

4.9. Political Influence

It ought to be noted that politics is ubiquitous and it determines everything as Harold Lasswell sees politics as who gets what, when, and how, even matters of land access and land use are majorly determined by politics.[117] Even before colonialism, access to land and specifically wetlands in Kampala were determined politically by the Kings of Buganda, clan leaders and family heads through the customary land tenure system.[118] Such a system would allow households to access land for farming to feed their families but the unit heads had a responsibility of guiding the rest upon the conservation of the wetlands.[119] However, the colonial government through the 1900 Buganda agreement took over most of the powers to allocate land and besides, its activities on land in Kampala such as construction of administrative units on hills and utilising flatlands for industries and infrastructure pushed many natives to conduct agrarian practice from wetlands.[120] The problem is that the colonial government did not prioritize the political will to conserve the wetlands but rather, initiating urban schemes that pushed many localsout of the uplands and the flatlands into the wetlands

[116] Gumm, E. (2011). The use and misuse of wetlands in Kampala.
[117]Lasswell, H. D. (2013). *The analysis of political behaviour*. Routledge
[118]Alden Wily, L. (2012). Looking back to see forward: the legal niceties of land theft in land rushes. *The Journal of Peasant Studies*, *39*(3-4), 751-775.
[119]Ibid
[120]Agatha, A. (2016). Traditional wisdom in land use and resource management among the Lugbara of Uganda: a historical perspective. *Sage Open*, *6*(3), 2158244016664562.

Even in the recent times, there has not been clear political will to enforce the NEMA Act for purposes of conserving the wetlands in Kampala.[121]Access to land has been used to strengthening of patronage and dependency especially among the elected officials in the Kampala city.[122]Such politicians use land allocation and control to strengthen their control, beef up their manifesto and gain political grounds for other subsequent terms. Wetlands are an important resource worth protecting. Therefore, enforcement of environment regulations including those on management of wetlands are done through a hierarchy of enforcement levels from national levels (NEMA and Wetlands Management Department), district down to community levels, the enforcement capacity available at all these levels appears not to be able to match the widespread nature of the problem of wetland abuse.[123]In addition, while the responsibility for wetlands management has been vested under the local authorities, cases of local authority intervention on wetlands management are not effective enough to stop wetland conversion to agrarian farms because they fear to lose political grounds in the process of forceful implementation of such laws.

For instance, there were some efforts by NEMA to evict wetland encroachers from Kinawataka wetlands in June 2022.Instead, this move was highly criticised by the Nakawa East Member of Parliament who argued that NEMA should have given wetland encroachers enough time and notice before being evicted.[124]Most local leaders in Kinawataka have been at the fore-front of stopping evictions from the wetland areas in which they conduct agricultural activities for survival. One of them was quoted arguing that;

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[121]Gumm, E. (2011). The use and misuse of wetlands in Kampala.

[122]Médard,C., & Golaz, V.(2013).Creating dependency: land and gift-giving practices in Uganda. *Journal of Eastern African Studies*, *7*(3), 549-568.

[123] Hartter, J., & Ryan, S. J. (2010). Top-down or bottom-up?: Decentralization, natural resource management, and usufruct rights in the forests and wetlands of western Uganda. *Land Use Policy*, *27*(3), 815-826.

[124]New Vision, June 10 2022 J 10, 2022

> *We will always vote for leaders who are willing to defend us against NEMA officials… these are leaders who understand the value of our votes and know how we survive on the wetlands…as agriculturalists, what shall we survive on without cultivating in the wetlands?*[125]

Furthermore, in January 2006, His Excellency President Yoweri Kaguta Museveni thwarted eviction efforts when he issued a directive stopping all evictions of encroachers in wetlands and forest reserves because there were a lot of unjust evictions without following the right procedures.[126] In Kampala, most of the people just took it to be a blank check to engage in further encroachment on the wetlands. The consequences of the above Executive order included among others: expanding wetlands into agrarian farms and settlement especially in areas of Kinawataka, Lubigi and Luzira. For instance an officer at NEMA indicated that since 2006, there has been an increase in the number of people who have encroached on wetlands for agriculture mainly in Lubigi and whenever NEMA enforcement officers try to evict them, they claim that the president stopped all the evictions.[127] This has made it very hard for them to operate effectively in terms of conserving the wetlands from agrarian exploitation.

Therefore, despite the political efforts put in place to establish legal frameworks and institutions for wetland protection and conservation, the same political actors lack the will to support the processes and the efforts to enforce the law yet without their will, nothing can be done and wetlands in Kampala will be continuously encroached upon and utilised by agrarian practitioners. The end result has been growth of agrarian farms on wetlands as farmers exploit the weak or lack of political will to conserve wetlands to their advantage.

[125] Key informant interview with a local political leader in Kinawataka, 2022
[126] Museveni, Y. (2000). *What is Africa's problem?*. U of Minnesota Press.
[127]Key informant interview with an officer at NEMA 2022

CHAPTER FIVE

5.0. THE IMPACT OF AGRARIAN ACTIVITIES ON KAMPALA WETLANDS

The previous chapter presented the factors for expansion of agrarian activities in the wetlands of Kampala. This chapter examines the impact of agrarian activities and the eventual evolution in Kampala wetlands, where we look at the level of wetland encroachment, ecological conditions and above all challenges and benefits of agrarian evolution on wetlands in Kampala. Despite the fact that most of the existing stories from the Kampala dwellers who utilize the wetlands for agrarian activities point to positivity in terms of promoting food security through making sure that food needs of the city are catered for on top of securing income for the farmers, they also acknowledge the fact that much of the impact of encroachment on the wetlands is negative.

Wetlands cover 10% − 13% of 241,037 km ^{2} of Uganda's land area; of which Kampala Capital City Authority (KCCA) covers 189 km ^{2}.[1] Out of this total dimension, the KCCA's share of wetland is 12.76 km ^{2} with Kinawataka wetland's land coverage standing at 1.5 km.[2] This ecological space is however, facing de-gradation through, rapid agrarian activities, housing activities among others.[3] Human activities have destroyed wetland coverage in Kampala from 96.3% of the total wetland land coverage to 82.5% in 2015 and to 80.6% in 2018.[4]This suggests a break-down in contemporary management mechanisms, wetland destruction was also found to

[1]Kakuba, Sultan Juma, and John Mary Kanyamurwa. "Management of wetlands and livelihood opportunities in Kinawataka wetland, Kampala-Uganda." *Environmental Challenges* 2 (2021): 100021.
[2]Willbroad, B., & Kiyawa, S. A.(2019). Journal of Environment and Health Science ISSN: 2378-6841.
[3]UBOS, (Uganda Bureau of Statistics).Population and Housing Census. Preliminary Results. Kampala.2014.
[4]Gideon, Omagor James, and B. Barasa. "Effects of Human Wetland Encroachment on the Degradation of Lubigi Wetland System, Kampala City Uganda'." *Environment and Ecology Research* 6, no. 6 (2018): 562-570.

have been encroached on by smallholder agricultural cultivation whose annual damage increased from 0.2% in 2002 to 1.6% in 2015 and 7.7% in 2018.[5] Equally revealing in terms of wetland management challenges were data which suggested that settlement in wetlands increased from 3.2% to 7.8% by 2015 and 12.5% by 2018. Currently, wetlands in Kampala have decreased by 50 percent, in the ten years between 1999 and 2019 this de-gradation comes in several forms like cultivation as new agricultural plants being introduced, this can lead to soil erosion and flooding.[6]From the specific point of view, the following accounts explain and discuss the impact of agrarian practices on wetlands of Kinawataka, Luzira and Lubigi in Kampala.

Impact of Agrarian Activities on Kinawataka Wetland

Kinawataka wetland was intact with no encroachment by agrarian practitioners in the pre-colonial era. Evidence from the research participants indicate that stories from their great grand-parents and clan leaders point to the fact that before the 20th century, there was adequate land for people to settle and grow crops from.[7]According to one resident at Kinawataka;

> *Before my late father died, he used to tell us that the floods that are attacking us in the uplands of Kinawataka were never even thought about during their early years of livelihood because running water had clear pathways that were never encroached on by farmers…he would add that the 1900s to 1980s, Kinawataka was not as populated as now days…*[8]

[5]Suh, Che Anselm, and Sundjo Fabien."Assessment of Causes and Effects of Wetlands Degradation in the Babessi Municipality, Ngoketunja Division of the North West Region in Cameroon." *Journal of Physical Science and Environmental Studies* 8, no. 1 (2022): 1-14.
[6] Tumusiime, Teddy Tindamanyire M. "The Contribution of Wetland Resources Management to Household Food Security in Nangabo Subcounty, Wakiso District, Uganda." PhD diss., Uganda Management Institute, 2013.
[7] In-depth interview with an elderly resident at Kinawataka, 2022
[8] Ibid

In addition, the de-gradation of the wetland became intensive in the late 1980s with the increasing population due to political stability in Kampala and this resulted into people utilising all the land for settlement in the dried-up areas thus, growing crops in the entire mass of Kinawataka.

This is in line with Tumusiime's observation that Kinawataka wetland experienced de-gradation to the extent that it decreased by 46% as its de-gradation rose from 49% to 95% from 1992 to the present. This is in line with another resident who notes that;

> *The quality of water flowing in the Kinawataka wetland has greatly worsened since the 1990s yet clear laws were made during this time…the water levels are at times over lapping yet at times very low…the water is dirty and becoming coloured…it may be due to the crop gardens eating up the wetland…actually, Kinawataka wetland cover has reduced completely…you may not even notice this water mass…*[9]

This means that one of the major results of agricultural growth on Kinawataka wetland is that the water flowing out of the wetland has deteriorated.[10] In addition, Tumuhaire adds that agricultural growth in Kinawataka has worsened the rates of flooding, drought and quality of water.[11]

Impact of Agrarian Practices on Luzira Wetland

The historical trends of de-gradation of Luzira wetland, findings show that the pre-colonial Luzira wetland was intact with no encroachment from agrarian practices.[12] However, the findings in this study indicate that water mass cover and quality begun reducing with time following the 1950s and 1960s following initial exposure to farmers who had encroached on the wetland for growing

[9]An in-depth interview with a resident at Kinawataka, 2022
[10] Aryamanya-Mugisha, H. (2011) World wetlands day.
[11] Tumuheire, Amos. "Impact of land use changes and wetland degradation on water: Case of Upper Kinawataka wetland, Kampala-Uganda." (2017).
[12]Habonimana, HERVE VILLARD. "Integrated flood modeling in Lubigi catchment Kampala." Master's thesis, University of Twente, 2014.

crops to support the growing food market in Kampala. According toa senior citizen residing in Luzira;

> *Before colonialism, we had land enough to grow crops on dry lands as our parents would narrate…when colonialists came into Uganda, they took over land in strategic areas for their offices…but also the population was growing and market for food by 1950s and 1960s was increasing…the only part to grow food were the wetlands…I believe that the gradual increase in food growing in wetlands has reduced their productivity that even mudfish that we used to get out of these places has reduced…*[13]

This, whereas agricultural activities have expanded on Luzira wetland, the natural providence of being beneficial to all, it is now beneficial to a few farmers and those who share on the crops produced.

In addition, there has been over flooding of the Luzira wetland in the 21st century, a situation that residents claims was not witnessed in the 20th century. According to a participant who was a farmer of sugar-cane, cocoyam and sweet potatoes in Luzira wetland, she has cultivated in this wetland for about 40 years since 1982 but it was not until the 2000s that she witnessed over flooding of the Luzira wetland to the tune of attacking their nearby houses.[14]She further argues that;

> *From 1984, I have been growing sugarcane, Cocoyam and sweet potatoes on a relatively small scale in Luzira wetland but by 2000, there was increase in the demand for food crops in the nearby markets like Luzira, Kitintale, Mutungo and others…the piece of wetland use for growing my crops widened and I closed some*

[13]An interview with a senior citizen resident at Luzira, 2022
[14]An interview with a female resident farming in Luzira wetlands, 2022

former water paths but I think this has led to massive flooding because I am not alone doing this and yet water doesn't have where to pass.[15]

This implies that much of the flooding intensity has been witnessed in the 2000s onwards within Luzira wetland communities and this is partially linked to the agrarian encroachment on the wetland and escalation in the intensity of agrarian practices that have disrupted on the water pathways.[16] The worsened flooding as a result of agrarian encroachment on wetlands has affected streets, homes and businesses with water leading to serious property damage and disrupting work and business. These floods have further had health implications on the residents of Luzira and the neighbouring areas. For instance, one of the participants attests to this that flooding has drugged human wastes (faeces) from pit latrines and bacteria from other places causing an increase in Cholera, Dysentery, Diarrhoea and Typhoid Fever.[17]

Once the water has collected it often sits stagnant and thus becomes a breeding ground for mosquitoes hence increased malaria rates.[18]It is also indicated that fish species in Luzira wetland have reduced due to agrarian activities mainly the growing of crops in breeding areas for fish as the growing of crops has consumed spaces in which fish used to breed.[19]In his own words, one of the Fish vendors in Luzira states that;

In the 1980s, I used to get a lot of silverfish and mudfish from the Luzira wetlands that I would sell in all the markets around, however, because of the growing of

[15]Ibid
[16] Ssebaana K. J. 2002 Key food security issues /challenge in Kampala city. World Banks Food Security Initiative on feeding cities in the Horn of Africa work- shop. Addis Ababa Ethiopia.
[17]Interview with a resident at Luzira, 2022
[18] Fuhrimann, S., Stalder, M.etal 2015Microbial and chemical contamination of water, sediment and soil in the Nakivubo wetland area in Kampala, Uganda. Environmental Monitoring and Assessment.
[19] Kwesiga, M. (2006). Impact of urbanization on wetland degradation a case study of Nakivubo-luzira urban wetland, Nakawa division, Kampala city, Uganda.

> *crops that has eaten up the entire swamps, water spaces supporting these fish breading has been disrupted…now, more food crops are being sold in the nearby markets than the fish from the wetland.*[20]

In general, Luzira Wetland has drastically reduced in size. The conversion and loss of wetland has come with a number of factors that affect major changes in the area.[21]In addition to large crop fields, the big part of the wetland in Kampala has also been converted into homelands.

Nevertheless, with great awareness that encroachment on wetlands for agrarian practices has disrupted the schedule of rainfall in Luzira community, the people there claim to be increasingly using the wetland for growing crops mainly by growing rice as cited. This reveals that the impacts of agrarian practices on Luzira wetland seem to be continuing for some time and the effects mentioned above may just increase with time.

Impact of Agrarian Practices on Lubigi Wetland

Related to the narratives obtained in Kinawataka and Luzira wetlands, flooding was put forward by the people around Lubigi wetland as one of the outstanding impacts of growing crops such as cocoyam, sugar-cane and vegetables for commercial purposes.[22]As a result of the post NRA/NRM bush war in the 1986, markets around Lubigi demanded for more food supply and people intensified crop growing in the wetland but this came along with increased flooding.[23]In his own words, one of the LCI Chairpersons along Jenimah-Lubigi Nabweru road argued that;

[20]An interview with a fish vender at Luzira market, 2022
[21]Fuhrimann, S., Stalder, M.etal 2015Microbial and chemical contamination of water, sediment and soil in the Nakivubo wetland area in Kampala, Uganda. Environmental Monitoring and Assessment.
[22] Kakuru, W., Turyahabwe, etal 2013Total Economic Value of Wetlands Products and Services in Uganda. The Scientific World Journal.
[23]Narratives from field participants' perceptions, 2022

> *Before the bush war of 1981-1986, crop growing in Lubigi was for subsistence purposes only…but when the war ended and peace came, markets like the one in Jenimah, Nabweru road junction, Busega, Kalelwe, Masitowa, Kasubi, Bwaise and many others begun growing at a terrible speed thus demanding for more food supply…as more people encroached on the wetland, we have seen increase in the problem of floods from the late 1980s, through the 1990s and to bad in the 2000s.*[24]

In another account, an officer at the Lubigi Sewage Treatment Plant argued that;

> *With the rate at which people are encroaching on the wetland for crop growing, the water pathways have been disrupted and water end up in the gazetted area for sewage treatment whenever it floods over…*[25]

In addition, according to Habonimana, Lubigi as a water catchment suffers from flooding events occurring every year since the early 1990s affecting a large number of the population, mainly the poor, and threatening their livelihood on agriculture in the wetland.[26]In his own words, a resident of Nabweru asserted that;

> *Floods have always been frustrating all activities in the entire area surrounding Lubigi wetland and we have experienced more intensity with the increasing encroachment on the water catchment areas and water movement channels by agricultural activities…the more people have grown crops, the more flooding water has had nowhere to go but just to enter our compounds and businesses.*[27]

Therefore, this shows how the continuity in utilisation of Lubigi wetland for crop growing has worsened the problem of flooding on annual basis.[28] In another development, findings reveal that

[24]Key informant interview with an LCI chairpersons along Jenimah-Lubigi Nabweru road
[25]Key informant interview with an officer at the Lubigi Sewage Treatment Plant
[26] Habonimana, HERVE VILLARD. "Integrated flood modeling in Lubigi catchment Kampala." Master's thesis, University of Twente, 2014
[27]Key informant interview with an LCI chairpersons along Jenimah-Lubigi Nabweru road
[28]KCCA. Strategic Plan: 2015 Laying the Foundation for Kampala City Transformation Kampala: Kampala Capital City Authority (KCCA).

the more agrarian practices continue in Lubigi wetland, the green plantation cover reduces too.[29]According to an elderly resident in Lubigi, before the 1960s and throughout the 19790s to the early 1080s, Lubigi was a wetland purely covered by trees and grass with the biggest part being covered with palm trees, thorny trees and papyrus.[30]According to an old man from Jenimah, he believed that these trees and grass were in a pattern that could give direction to the waters on how to flow towards a particular direction and with roots holding firm on the ground, however, to his knowledge, he believed that the more people cut down these trees to grow rice and other crops, the more the drainage system was distorted and when rainy seasons come, Lubigi and the nearby places are eaten up by flooding.[31]He added that;

> *As we were growing up in the early 1950s, 1960s, 1970s and early 1980s, trees mainly the thorny ones, palm trees, papyrus and grass in Lubigi would be left intact, but these days, people cut them down and plant rice…anyway even me, these days when I plant my rice in the garden near Lubigi, Nabweru road, I cut these trees because they attract birds to eat my rice…but I think this is not good because we no longer have these trees to direct water through their roots to the right direction and when it rains heavily, you find this water attacking us up to our homes…the water reaches up to here yet it used not to be the case.*[32]

[29] Odeke, C. (2019). *Wetland degradation and carbon sequestration potential–a case of Lubigi wetland, Uganda* (Doctoral dissertation, Kyambogo University (un published work)).
[30] Lwasa, S. 2005Adapting Urban Areas in Africa to Climate change: The Case of Kampala. Current Opinion in Environmental Sustainability. Science Direct.
[31]Key interview with an elderly in Jenimah, 2022
[32] Ibid

Therefore, the people using Lubigi wetland for agronomic activities have continued to destroy the vegetation in the wetland despite their knowledge about its role in giving direction to water movement in the wetland.[33]

It is further noted that there has been increasing rates of environmental pollution mainly water and air pollution in the areas surrounding Lubigi and this was partially linked to agrarian practices in the wetland. For instance, a respondent operating from Jenimah stage along Kyebando road explained arguing that;

> *I have been selling timber and furniture from here since 1994, however, after every year, I see that the quality of water and air in the area reduces after every year. In fact, by the time I came here, we would freely fetch water from the nearby well which was getting water from the wetland. However, because of the fact that cows are taken to the swamp, people burn grass to clear fields for rice and cocoyam as well as spreading chemicals for their crops to perform, the entire water is contaminated, it changed the test and even the colour…even when you get it from the springs that were put to replace the well…it is of poor quality.*[34]

This corresponded with another informant who grows and sells cocoyam within Lubigi wetland. This *respondent argues her mixed feelings arguing that;*

> *I am now fifty years old and I have spent my 32 years growing and selling cocoyam in Lubigi wetland, the business has given me money to take care of my orphaned children…but I have realized and always asked myself on whether we are doing the right thing because the government has also blamed us…indeed, the air we are used to breath is not of the same quality like that of the one we used to breath…it is smelly and not pure as those years before 2000s…but the problem is mainly with*

[33] NEMA. 2003 Assessment Needs for Wetlands Inventory and Tools for Assessing, Mapping Wetland Types and their Distribution Report. Kampala, Uganda.
[34]In-depth interview with a respondent operating from Jenimah stage along Kyebando road

those growing rice because they burn grass in preparation for planting, spray their rice with herbicides and plant that rice in water…[35]

By implication, the execution of agrarian practices within Lubigi wetland has had negative impacts mostly on the wetland as a lot of distortion of the eco system has occurred. Ranging from flooding, rainfall disruption, pollution and vegetation loss, agriculturalists have failed to operate their activities in a manner that promotes peaceful co-existence with nature.[36] The problem has, however, been seen more in the recent years from the late 1980s onwards as reflected in most of the accounts given by participants.

5.2. Benefits of Agrarian Evolution in Kinawataka Wetland

Analysis in the previous section indicated that there are a number of negative impacts on the ecology and the human life-style. Despite the challenges brought about by agrarian evolution there are also some benefits that keep driving actors into continuous encroachment on the wetlands. A number of narratives have been fronted mainly in agro-based economies in which the largest number of people depend on agriculture that it is hard to do away with agrarian activities in wetlands. Evidence points to the fact that agriculture is looked at as a drive to reduce poverty, raise incomes and improve food security for 80% of the world's poor, who live near wetland areas of urban metropolis.[37]In addition, Brinson, & Malvárez have argued that wetlands have been used for agriculture for thousands of years in urbanized areas as they provide a range of valuable ecosystem

[35] In-depth interview with an informant who grows and sells cocoyam within Lubigi wetland
[36]Aryamanya-Mugisha H. 2011. "Twenty Years of Wetlands Conservation in Uganda—Have Uganda's Wetlands become Wastelands Again?" Paper presented on World Wetlands Day, Public Talk at Uganda Museum, Kampala.2011
[37]Baiphethi, M. N., & Jacobs, P. T. (2009). The contribution of subsistence farming to food security in South Africa. *Agrekon*, *48*(4), 459-482.

services, such as the provision of food and clean water as well as the retention of soil and the cycling of nutrients.[38]

There are some benefits accruing from agrarian evolution in Kinawataka. One of such benefits has been the increasing rate of vegetation cover in some places along the wetlands. For instance, people have experienced the increasing rate of vegetative cover within the areas of Kinawataka wetland in which people using wetlands have planted trees for commercial basis but contribute to the vegetation cover. This is confirmed by one of the farmers in Kinawataka that;

> *I have been growing sweet potatoes and sugarcane from this wetland since 1992, however, from 2001, I have been planting pine and eucalyptus for every five years and I think these are better in adding on the vegetative cover in this wetland.*[39]

Similarly, an LCI chairperson of Kinawataka argued in an interview that many of his voters have embarked on planting trees in Kinawataka wetland and these trees although are cut down after some time, they re-plant others or even some re-germinate mainly the eucalyptus.[40] In his own words, the chairperson emphasised that;

> *The business in this wetland since early 2000s has been planting medium and small gardens of trees that my voters sell mainly after five years and then let them to re-germinate or re-plant others…maybe it is because of the pressure from government on growing of crops like sugarcane and rice in this wetland…I think these trees are very important to the wetlands…*[41]

These trees are said to have helped in maintaining the water levels of Kinawataka wetland by residents who compared the situation in the 1990s where agriculture in Kinawataka wetland was

[38]Brinson, M. M., & Malvárez, A. I. (2002). Temperate freshwater wetlands: types, status, and threats. *Environmental conservation*, *29*(2), 115-133.
[39]In-depth interview with a farmer in Kinawataka, 2022
[40]Key informant interview with the LCI chairperson for Kinawataka, 2022
[41]Ibid

mainly on food crops that called for cutting down trees and the water levels would always be very low.[42]This according to one of the resident has helped in improving the water level for instance he notes that;

> *For the time I have lived in Kinawataka since my early teenage age in the 1960s, we begun growing simple food crops in this wetland for domestic use, by 1980 and 1990, we increased the scale of growing crops such as potatoes, cocoyam, rice, yams, for commercial supply to the nearby markets…water levels would be very low as we could cut down trees to give room for ground crops to perform well, but the fact is that from 2001 onwards, most of the farmers have resorted into tree growing and evidently, we see that the water levels are relatively higher than before because these trees can be grown for about five years before being cut…I think they provide enough green cover.*[43]

Therefore, the shift from cutting down trees to growing of trees, referred to as 'forest transition', represents a shift from net de-forestation to net re-forestation, which is essentially a transition from non-sustainable to sustainable wetland management and this also helps to balance the eco-system to help in the management.[44] Wetland transitions were experienced in many locations in Europe and North America, and may be anticipated in developing nations that are now experiencing net de-forestation.[45] Wetland transitions do not require a decrease in population, but can follow agricultural innovations that increase production from smaller agricultural areas. The inverse relationship between population and wetland area has weakened if not reversed in recent decades over a global scale. Wetlands tend to stabilize before population does, which raises questions about

[42]In-depth interview with a 70-year-old resident of Kinawataka, 2022
[43]Ibid
[44]Kamugisha, J. R.1993 Management of Natural Resources in Uganda: Policy and Legislation Landmarks, 1890-1990. SIDA Regional Soil Conservation Unit. Nairobi.
[45]Lwasa, S. 2005.Adapting Urban Areas in Africa to Climate Change: The case of Kampala. Current Opinion in Environmental Sustainability. Science Direct,

the direction of causality or the primacy of population as a driver of wetland clearance.[46] In post-industrial societies, wetland transitions have often been accompanied by population shifts to urban areas and a shift from preindustrial to industrial use of wetland products. In any case, land no longer needed for agriculture is reforested[47]

[46]BTC Uganda. 2009 Environment and Natural Resources Report Series: Enhancing Forests' Contribution to Growth, Employment and Prosperity. Kampala: UNDP-UNEP Poverty-Environment Initiative.

[47]Emerton, L., L. Iyango, P.etal.1998 *The Present Economic Value of Nakivubo Urban Wetland, Uganda.* Nairobi: IUCN—the World Conservation Union.

Benefits of Agrarian Evolution in Luzira Wetland

From accounts given by participants from Luzira on how agrarian practices may be of benefit to the community, majority of them linked the growing of crops and rearing of some animals such as cattle, pigs, aqua-culture and others to food security and poverty reduction.

Although these accounts did not clearly link agrarian evolution and food security to the ecological point of view benefiting wetland conservation, participants clearly explained the way over decades, they have been assured of food security due to agrarian practices in the Luzira wetland. For instance, one respondent noted that;

> *I was born in 1952 just a few years to independence, as I was growing up, we had enough land from where to grow food and there were no worries for food insecurity…however, the increase in population occupying most of the land where we used to grow food from between 1980 and 1990 led to the outbreak of prolonged hunger in the area in which people named it 'enjjalaanyiakuwaddeakatebe'- meaning that whoever welcomes a visitor at the time of eating, has to part his or her share of food to that visitor…anyway this went on up to the 1990s. The only rescue was to grow more food in the wetlands because for them they can serve throughout the year…we are now assured of food.*[48]

In this case, the contribution of urban agrarian to food security and healthy nutrition is probably most important asset.[49]Food production in the city is in many cases a response of the urban poor to inadequate, unreliable and irregular access to food, and the lack of purchasing power[50]. Kampala like most cities in developing countries was not able to generate sufficient (formal or informal)

[48]An interview with a 70-year-old female resident of Luzira, 2022
[49]Bush, G., S. Nampindo, C. A,etal 2004. *The Value of Uganda's Forests: A Livelihoods and Ecosystems Approach.* Kampala: National Forestry Authority.
[50]Ibid

income opportunities for the rapidly growing population.[51]The World Bank estimates that approximately 50% of the poor live in urban areas (25% in 1988).[52] In urban settings like Kampala, lack of income translates more directly into lack of food than in a rural setting (cash is needed).[53]

Urban agrarian improved both food intake (improved access to a cheap source of proteins) and the quality of the food improved (poor urban families involved in farming eat more fresh vegetables than other families in the same income category).[54] In Kampala, children aged five years or less in low-income farming households were found to be significantly better-off nutritionally (less stunted) than counter-parts in non-farming households. The LCI Chairperson of Luzira 'Kumusanvu', notes;

> *Since we are assured of different types of food including fish from the wetland, our children are fed well and the Village Health team members of my village are found of encouraging us to feed our children well on fresh foods…we are never worried because we grow this food, rear animals, birds and fish ourselves…we eat balanced diet and our children are healthy that when you look at them, you may wonder whether they are from agrarian families.*[55]

Urban producers obtained 40to 60percent or more of their households food needs from their own urban gardens.[56] In addition to production for their own consumption needs, large amounts of food are produced for other categories of the population. It was estimated that 200 million urban residents globally provide food for the market and 800 million urban dwellers were actively

[51]Hepworth, N., and M. Goulden.2008 Climate Change in Uganda: Understanding the Implications and Appraising the Response. Edinburgh: LTS International.
[52]Ravallion,M. (1998). *Poverty lines in theory and practice* (Vol. 133). World Bank Publications.
[53]Hepworth, N., and M. Goulden.2008 Climate Change in Uganda: Understanding the Implications and Appraising the Response. Edinburgh: LTS International.
[54]Ibid
[55]A key informant interview with the LCI Chairperson of Luzira 'Kumusanvu', 2022
[56] Kakuru, W. 2011Wetlands Review for the Country Environmental Analysis. Kampala.

engaged in urban agrarian in one way or another.[57]The urban farmers produced substantial amounts of food for urban consumers. A global estimate is that 15-20% of the world's food was produced in urban areas.[58]Urban agrarian to a large extent complements rural agriculture and increases the efficiency of the national food system in that it provides products that rural agriculture cannot supply easily, for example, perishable products (products that require rapid delivery upon harvest) that can substitute for food imports and can release rural lands for export production of commodities.[59]

Benefits of Agrarian Evolution to Lubigi Wetland

Ranging from income, food, labour and general livelihood, accounts from the people of Lubigi connect to the value they attach on the agrarian practices within the wetland. The most striking feature of urban agrarian, which distinguished it from rural agriculture, is that it is integrated into the urban economic and ecological system.[60] Urban agriculture is embedded in and interacting with the urban eco-system. Such linkages included the use of urban residents as labourers, use of typical urban resources (like organic waste as compost and urban wastewater for irrigation), direct links with urban consumers, direct impacts 'on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, being influenced by

[57] Ibid

[58]Karanja, F., L. Emerton.etal. 2002 .*Assessment of Economic Value of Pallisa District Wetlands.* Kampala. Uganda: Biodiversity Economics Programme for Eastern Africa. IUCN. The World Conservation Union and Uganda National Wetlands Programme.

[59]Kateregga, E.2010 "Economic Analysis of Actions Proposed for Strengthening the Governance of Chemicals Management for the Agriculture Sector under the UNDP/ENDP Strategic Approach to International Chemical Management (SAICM) Project." Makerere University, Faculty of Economics and Management. Kampala.

[60]Mougeot, L. J. (2000). Urban agriculture: definition, presence, potentials and risks. *Growing cities, growing food: Urban agriculture on the policy agenda*, *1*, 42.

urban policies and plans, among others.[61] Urban agriculture is not a relic of the past that can fade away (urban agrarian increases when the city grows) nor brought to the city by rural immigrants that would lose their rural habits over time. It is an integral part of the urban system. One respondent at Namungona near Lubigi wetland argued that;

> *Since I was born in the 1950s, I have lived and survived on the wetland of Lubigi but the difference is the intensity of conducting crop growing that have been changing over time. In the 1960s when I got some sense of understanding, I could plant cocoyam for domestic consumption, by 1990, we begun growing cocoyam on a large scale to supply to the markets of Kasubi, Kalerwe and Busega…by 2006, I was employing young men and women to plant, weed and harvest my cocoyam and I would pay them as I also earn a living…*[62]

Furthermore, increase in food production in Lubigi wetland has also helped in the fight against hunger. Most of the local residents in Kampala consume the food grown locally in the wetlands of the city, some of these foods include, yams, potatoes and rice. The growing of these crops by locals of Lubigi has enabled them to have something for survival since they cannot afford buying food on daily basis.[63] Empirical evidence shows that in the second half of the twentieth century (1980-1999), a major transformation of agriculture took place that is generally referred to as the green revolution; in this case, this explains the clearing of Lubigi wetland to cater for the increasing population in the areas of Kampala and nearby Wakiso.[64] This transformation was characterised by reliance on chemical fertilizers and pesticides and abandonment of traditional sustainable

[61]Ibid Opicit Kakuru
[62]An interview with a 70-year-old resident of Namungona, 2022
[63]Ibid Opicit Kakuru

[64]Mubiru,D.N.,Komutunga, E.,Agona, A.,Apok, A.,&Ngara,T.(2012). Characterising agrometeorological climate risks and uncertainties: Crop production in Uganda. *South African Journal of Science*, *108*(3), 1-11.

practices that replenish soil fertility and utilise fallow periods on land and the complete destruction of wetlands to give way for the food production.[65] Globally, a related movement had great successes and failures. Successes include meeting most of the global food demand in spite of rapid increases in population. Failures include increases in water pollution, generation of green-house gases, loss of bio-diversity, and accelerated soil erosion and sedimentation. In general, food production out-paced population growth. From 1961 to 2007, global food production increased 138% from 1.84 to 4.38 billion tones, whereas global populations grew 123% from 3.0 to 6.7 billion.[66]

Therefore, this implies that the people of Kinawataka, Luzira and Lubigi who are part of these statistics just like they have argued in the findings look at agrarian activities in the wetland as the best way to sustain a living in terms of food security, income and at times labour.

[65]Ibid Opicit Kakuru
[66]United Nations Environment Programme (UNEP). 2014Assessing Urban and Peri-urban Agriculture in Kampala, Uganda.

CHAPTER SIX

CONCLUSION

6.0. Introduction

In this research, the origins of the agricultural evolution on wetlands in the Kampala district from 1900 to 2010 were examined. The study was carried out in the Kampala wetland areas of Kinawataka, Lubigi, and Luzira. The main claim of this study was that farming activities on Kampala's wetlands had grown quickly over time and were not the result of a brief period of time.

Through a thorough assessment of the literature, the study established its interest in earlier studies and found contextual, geographic, and methodological gaps that helped to support the necessity of the current study. Wetland encroachment and its impacts on Kampala has been the subject of studies by Aliguma, etal,[1] Kabiri, etal,[2] Kakuba & Kanyamura,[3] Kamugisha,[4] and others that have offered broad information. However, there is no specific account investigating the origins of agricultural evolution on wetlands in the Kampala district, despite the fact that such material contributes to the literature on wetland usage and conservation. This research has sought to recreate the origins of agrarian evolution on wetlands in Kampala district by analysis of historical records and investigation of empirical data utilizing observation, archival source, and in-depth interviews.

The word "wetland" is defined as a location where the land is covered by water, whether salt or fresh, or anywhere in between marshes and ponds. Other examples of wetlands are the margin of a lake or ocean, the delta at the mouth of a river, and low-lying places that regularly flood. Peat

[1]Aliguma L (2004) Strengthening Urban and Peri urban agriculture in Kampala .Formal survey report. Urban harvest and centro Internacional de agriculture Tropical ,Kampala Uganda

[2]Kabiri S,Allen M,Okuozia J,T Akello (2020) Detecting level of wetland encroachment for urban agriculture in Uganda using hyper temporal report

[3] Kakuba S, J and Kanyamurwa J.M (2021) Management of wetlands and livelihood opportunities in Kinawataka wetland ,Kampala, Uganda .Enviroment challenges

[4] Kamugisha J .R(1993). Management of natural resources and Environment in Uganda

areas, marshes, rivers, lakes, deltas, flood plains, flooded forests, rice fields, and even coral fields are all considered to be wetlands. Every nation and every climatic region, including the polar regions, the tropics, high elevations, and arid zones, has wetlands. Rather of being seen from a single stand-point, the urgency and growth of agricultural activities in Kampala's wetlands have been seen from two perspectives.

Chapter2 examines the geography and history of wetland settlement in the Kampala area using geographical concepts like topography, climate, drainage, and soil analysis. To determine when agriculture was first practiced in Kampala, the history of the wetlands was examined. Although not the primary emphasis of this research, it was necessary to comprehend the geography of these regions in order to adequately appreciate some of the factors that have impacted the growth of agrarianism. This was crucial in allowing for the investigation of the developments and changes in these wetlands.

The third chapter investigated the beginnings of agrarian evolution on Kampala's wetlands, which refers to the commencement or emergency of agricultural operations there. Agriculture as a kind of economic practice has had an impact on several wetlands in Kampala, even if there are tendencies in historical expansion. This section, therefore, provides a historical overview of how agrarian activities in wetlands may be tracked from pre-colonial origins through the colonial and post-colonial periods in Kampala up to 2010. These stories play a key role in providing a clear historical perspective of the agricultural activities in Kampala's wetlands of Kinawataka, Luzira, and Lubigi.

In addition to analyzing the causes of the quick conversion of wetlands into agricultural areas, chapter four also provides information on urban farming, the availability of land for it, eco-culture,

and the repercussions of urbanization. The chapter opens with a presentation of the reasons in favour of urban agriculture throughout time.

The influence of agricultural operations and the subsequent evolution of Kampala's wetlands were addressed in Chapter five. This chapter also looked at the extent of wetland invasion, ecological conditions, and most importantly, the difficulties and advantages of agrarian evolution. Even though the majority of the accounts from Kampala residents who use the wetlands for agricultural purposes highlight positive aspects of promoting food security by meeting the city's nutritional needs while also providing income for the farmers, they also acknowledge that encroachment on the wetlands has a significant negative impact. This chapter has an in-depth explanation of this.

Wetland usage and conservation in Uganda, Africa, and the rest of the globe have a new face. Thanks to the historization of the beginnings of agricultural evolution on wetlands in the Kampala area. Future researchers who want to do more study in relevant topics or fields will be able to use this dissertation as a reference. This will be useful for planning purposes so that Kampala Capital City Authority, National Environment Management Authority, and other environmental agencies may adopt laws that would help preserve wetlands and stop the impending extinction of these eco-systems due to agricultural operations.

Conclusion

Wetland usage has long been a controversial topic because of the hazardous and progressively worsening activities that have developed over time. However, discussions have also persisted among interested parties in an effort to provide descriptions of the urgency of wetland use activities that include to a larger context, agricultural practices, which have been the focus of the current study's main research topic.

This was accomplished by examining the origins of agrarian evolution on wetlands on the wetlands of Kinawataka, Luzira, and Lubigi in the Kampala District; discussing the causes of the wetlands' rapid conversion to agrarian spaces in Kampala and analyzing the effects of agrarian evolution on wetlands. The study used an exclusively qualitative technique to achieve these goals, focusing heavily on oral interviews with key informants and locals from the communities of Kinawataka, Luzira, and Lubigi. The researcher went to the Kampala district and examined the wetlands-related legislation, regulations and publications that were already in place. Articles, diaries, and other types of written materials were deployed to acquire official information.

In pre-colonial Buganda where Kampala was located, there were customary norms that directed land use practices for generations. These customs included treating wetlands as sites with a strong ceremonial foundation, where certain farming techniques could not be permitted. People had to under-go purification, and they were forbidden by long-standing taboos and beliefs to engage in actions that would trigger crises in their wetlands. But modern Christianity and Islam outlived this, weakening taboos and superstitions and advancing the reality of a global competitive economy ruled by egotistical people. The contemporary agrarian evolution difficulties in Kampala's wetlands are explained by Western economics. It demonstrated how the urban poor obtained land, as well as government programme.

The Kingdom of Buganda, of which Kampala was a part, was given protection by Britain as a result of the Buganda Agreement of 1900. A total of 9,000 square miles of wetlands and other uncultivated land were given to the colonists, but with minimal supervision and administration, exposing the wetlands to more agricultural activity than before. Many wetlands were encroached upon by the local population between 1962 and 1971. The majority of wetlands were used with such caution that, despite agricultural activity occurring, the wetlands had not been drained as they

would later be. This is due to the fact that before 1974, people exploited these wetlands for agrarian purposes, hence the post-colonial government did not have a centralized authority over them.

The main conclusion to the research issue about the origins of agricultural evolution on wetlands in the Kampala area from 1900 to 2010 with the case of Kinawataka, Luzira, and Lubigi wetlands is that the wetland's vulnerability to agrarian encroachment has changed through time. This has been ascribed to changes in lifestyle, including urbanization and industrialization, rising populations, violent conflicts, and legal systems that have supported farming operations in wetlands.

Such occurrences have in fact changed with time, beginning with the pre-colonial period (prior to the 1890s), continuing through colonial times the 1900s, the 1960s and 1970s, the immediate post-colonial period the 1980s, the 1990s, and the 21th century. Agrarian activities in the marshes of Kinawataka, Luzira, and Lubigi, which people refer to as evidence of their need for a living and survival, have been intensifying over time due to a combination of push and pull forces. The key claim of the study's findings and analysis is that, rather than being a direct cause of urban "agrarianism," the development of agrarian activities in Kampala wetlands was a result of the changing dynamics of the urban environment. According to research, farmers in Kampala who use wetlands view these activities as both damaging and advantageous to the ecology.

Urban agriculture expanded as a result of a crisis and as a way to seize opportunities. Urban agriculture flourished in Kampala and became essential to the wellbeing of many families due to the crises that Ugandans had faced there from the early 1900s and the desire for well-being among peri-urban residents. For instance, the rising per-urban population's desire for more food has an impact on farming in wetlands. Many residents of Mbuya, Banda, and Kinawataka had to deal

with the issue of food insecurity by planting crops like yams, vegetables, and sugar-cane in the neighbouring swamp, to name just a few. Eco-culture is a new idea that emphasizes the inter-connectedness of nature.

Of Uganda's 241,037 kilometres of land, 10% to 13% are covered by wetlands, of which Kampala Capital City Authority (KCCA) occupies 189 kilometres. With Kinawataka Wetland covering 1.5 km of its total size, the KCCA owns 12.76 kilometres of wetland. The quick agriculture operations, housing projects, and other activities are, nonetheless, contributing to the natural space's destruction.

In general conclusion therefore, Kampala is sitting on a time bomb that if the trajectory of encroachment on wetlands for agrarian practices remains as it has been between 1990s and 2010, the worst from nature will most likely be witnessed yet most of the gaps relate to the land use management system. This calls for mechanisms aimed at ensuring a comprehensive approach to promoting a peaceful co-existent environment between humans and wetlands mainly the agrarian practitioners. Given the existing gaps in the land use management systems, there is need for other researchers to conduct studies aimed at developing historical accounts on land tenure systems and how they have been affecting land use in Kampala as well as studying a comparative historical analysis of the traditional verses modern land use management systems in protecting and conserving wetlands in Kampala. Therefore, future researchers ought to embrace conducting studies related to developing historical accounts of the wetland conservation policies and their implications to livelihood in Kampala.

Areas of Further Research

Although the current study has investigated the genesis of agrarian evolution on wetlands in Kampala District, the reasons for rapid transition of wetlands into agrarian centres as well as the

effects of agrarian evolution, its time scope is limited to 2010. Thus, leaving a knowledge gap on events that have evolved in the last decade regarding agrarian evolution on wetlands in Kampala to-date. Additionally, there is need to do more research on the history of institutional framework for wetland conservation in Kampala, a study on historical accounts on the impact of traditional control systems for land use on the conservation of wetlands in Kampala, a study seeking an examination of the impact of colonial legacy on land use systems on wetlands of Kampala. These studies are anticipated to improve on the general scholarship of the discipline of wetland use in urban areas in Uganda, Africa and the World at large.

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APPENDICES

Appendix A: Photos showing agrarian activities in Wetlands in Kampala

Figure 2: In-Filling of Murram in Nakivubo Wetland

Figure 3: Yam faming in Lubigi wetland

Figure 4: Over grazing in Lubigi wetland

Figure 5: Farming and house construction in Luzira wetland

Figure 6: Wheat industry constructed in Lubigi wetland Kampala district

Figure 7: Sugarcane growing in Kinawataka Wetland Kampala district

Figure 8: Petrol depot in Lubigi Wetland Kampala district

Figure 9: Drying up fish in Lubigi wetland Kampala district

Figure 10: Grazing in Lubigi wetland Kampala district

Figure 11:Brick making in Lubigi wetland Kampala district

Figure 12: Houses constructed in Lubigi wetland by the urban poor

, 20.

Figure 13: Matooke plantation grown in Kinawataka wetland in Kampala district.

Figure 14: Polluted water poured in the Wetland from the nearby production facility

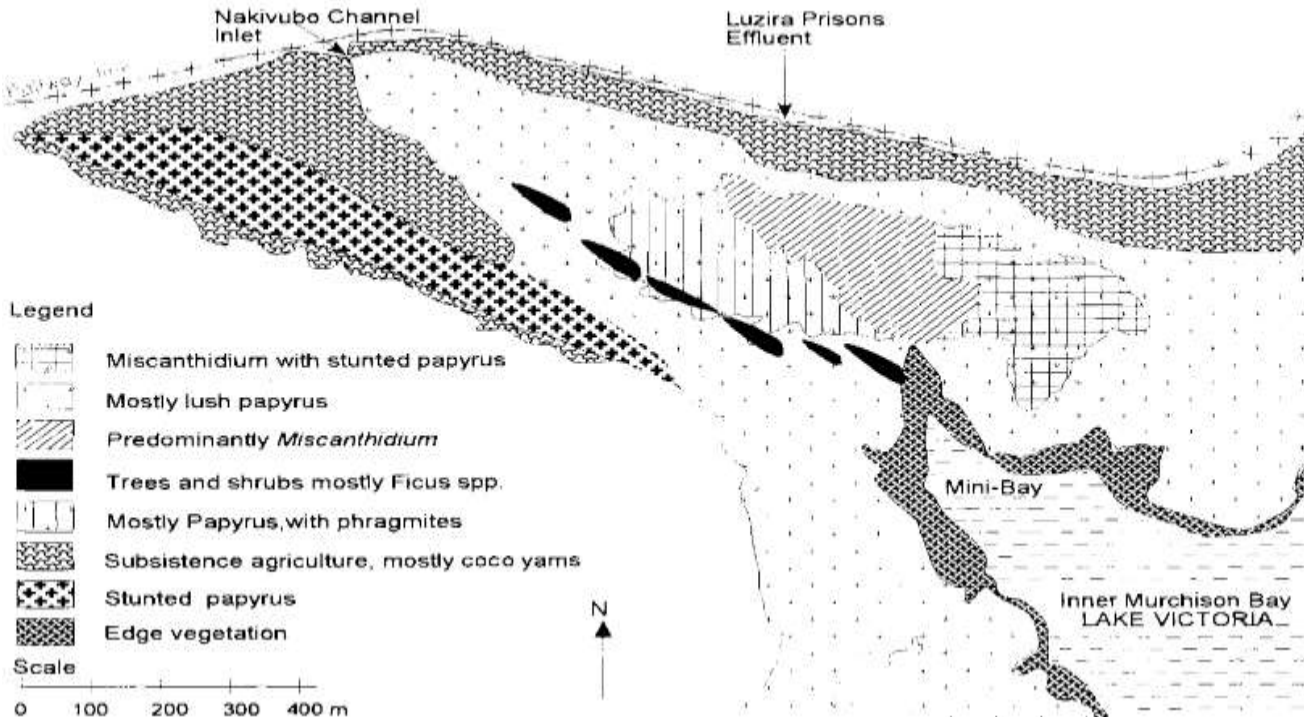


Figure 2.6: Vegetation cover for lower Nakivubo wetland in 1992

Recent studies indicated that a modest coverage of 70% would be acceptable in the short term[21].

Figure 15: Garbage dumped in un-gazetted area in Kinawataka wetland.

O

APPENDIX 1V:

EHICAL CONSIDERATIONS, CONSENT AND INFORMATION FORM FOR PARTICIPANTS ON THIS STUDY:

Agrarian evolution on wetlands in Kampala district from 1900-2010

Ethical considerations

The ethical considerations for this study included seeking the necessary official approval and clearance, respondents' consent, and observing the necessary confidentiality. A letter introducing the researcher to the respondents was obtained from Head of Department History Archaeology and Heritage studies Kyambogo University. (See Appendix BB).

Ethical considerations were further operationalized by fully explaining the purpose of the study to each respondent, the respondents' rights within the framework of the study, promising maximum confidentiality and privacy. The data collected shall only be used for the purposes of the study and in no way shall the data so collected be applied in other academic or for any other purposes.

Consent Form

I have read the Research Issues to be deliberated upon with the Researcher for this study titled "**Agrarian evolution on wetlands in Kampala district from 1900-2010"**and I have had the details of the study explained to me. My questions about the study have been answered to my satisfaction, and I understand that I may ask any further questions at any time during course of the interview. I also understand that I am free to withdraw from the study at any time, or to decline to answer any particular questions in the study without providing any justification.

I agree to provide information to the Researcher(s) under the conditions of confidentiality as set out in this form.

For study Participant:

Name: _____

Sign: _____

Date**:** _____

Researcher:

Researcher's Name: Mubene Eriya

Contact information: **0772155494 /0703038242**

Email:jmubene@gmail.com

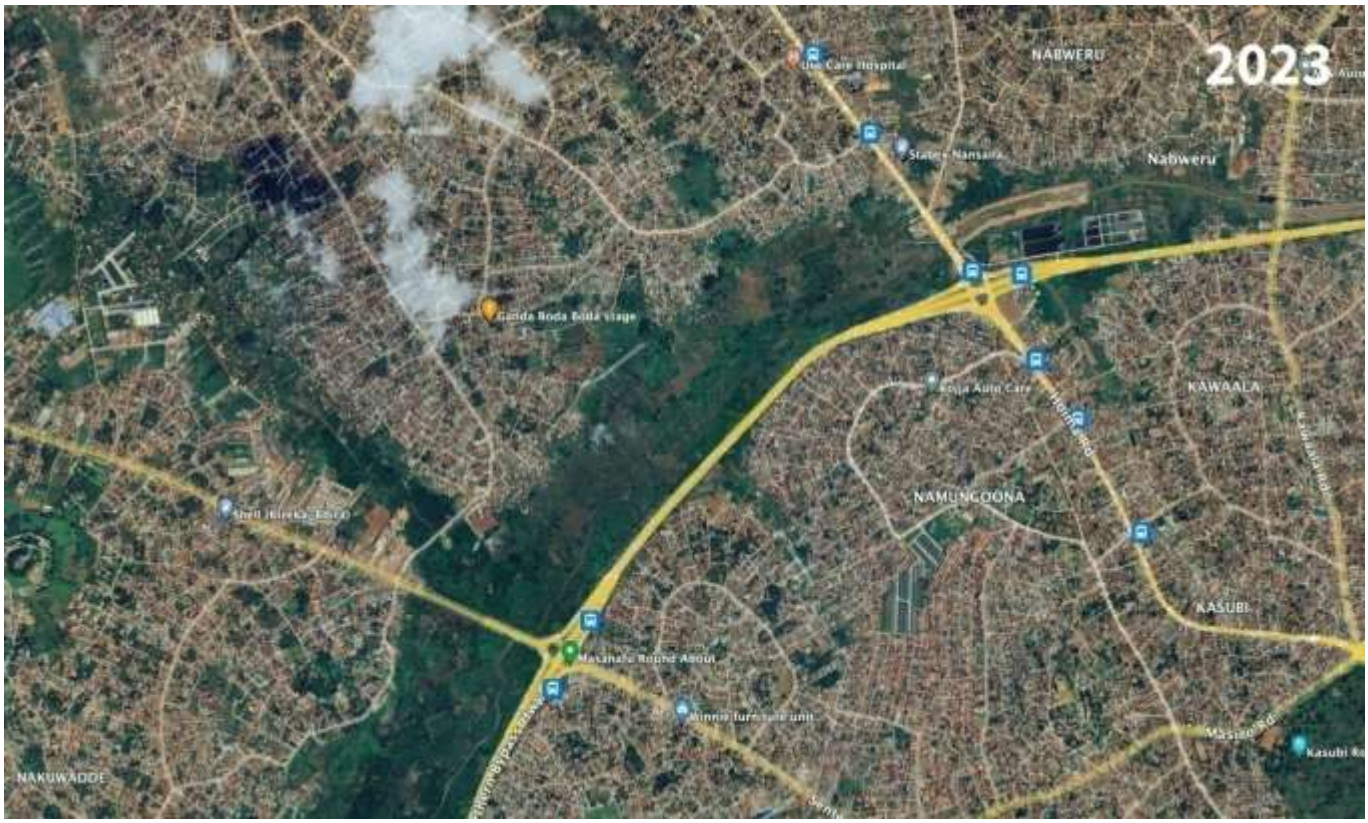
Research Issues:

Q

The study is generally interested in collecting information on the following concerns:

1. Genesis of agrarian evolution on wetlands in Kampala district
2. To discuss the reasons for rapid transition of wetlands of Kinawataka, Lubigi and Luzira into agrarian spaces in Kampala district
3. Impact of agrarian activities on wetlands of Kinawataka
4. Impact of agrarian activities on wetlands of Lubigi
5. Impact of agrarian activities on wetlands of Luzira
6. History of wetlands in Kampala
7. Wetlands and agriculture in pre-colonial Buganda
8. The colonial administration and changes in Wetland use
9. The post-colonial period and increased encroachment on wetlands
10. Arguments in support of urban agrarian activities in Kampala wetlands
11. Accessibility to urban wetlands for agrarian practices
12. Change in eco-culture
13. Effects of industrialization and urbanization
14. Climate change
15. Political influence
16. Benefits of agrarian evolution in Kinawataka, Luzira and Luzira

Map of Kampala showing wetlands



Source: **Chris Kayonga (2023)**

Appendix 1: Data Collection Tools

Tool 1: Key informant interview guide for (NEMA officials, KCCA officials, National forestry authority)

Good morning/afternoon Sir/Madam. My name is Mubene Eriya, a student of Masters of Arts in History and an academic researcher from Kyambogo University conducting a study on "**Agrarian evolution on wetlands in Kampala district from 1900-2010".** In this research, the data collected and the results from the research will all be used for academic purposes but not for any other reasons. Some of the questions asked in this survey may be personal and sensitive and the language used may be explicit but this is because the study seeks to be clear on what specific information is being asked and the specific responses sought. I understand it may, in some cases, make you uncomfortable but that is not the intention of the survey. It is not a must to participate in this survey and feel free not to answer any questions that you feel absolutely uncomfortable answering. Some of the issues asked maybe delicate but we promise to protect your confidentiality and anonymity as the study responses will be summarized and analysed as a whole to further reduce the risk of identifying any answers to any respondents.

For purposes of recalling the entire conversation, I request to record.

Do you agree that I start the interview and the recording? Yes/No

Section A: Bio data

1. What is your gender pronoun? Or what is your sex?
2. How old are you? By range 18-25, 26-30, 31-50, 51+
3. What is your level of education?
4. For how long have you lived or worked near this office?
5. What is your position in this office? (probe for position of leadership or administration)
6. Where do you stay? Probe for the cell, ward, T/C, Sub-County, County and district.
7. What is your current marital status?

Section B: Genesis of agrarian evolution on wetlands in Kampala district

1. As a leader/ administrator in this office do you think people use wetlands for agriculture? Yes/No. If yes, How did people come to use wetlands for agriculture (probe for the reasons for the genesis of agrarian evolution on wetlands in Kampala)
2. Where wetlands in pre –colonial Buganda also used for agriculture purposes? Yes/No. If yes, how were they carrying agriculture in a manner that conserved them?
3. If no, how did agriculture begin in wetlands in pre-colonial Buganda?
4. Did farmers grow all crops in wetlands Yes/No.? If yes how did some crops survive that environment?
5. If no, which particular crops were grown in wetlands?
6. Did colonial administration introduce any change on wetland use Yes/No .If yes what are they and how are affecting people who live there?
7. Did post-colonial period increase on wetland encroachment in Kampala Yes /No .If yes, what caused this increase?

Section C: Reasons for rapid transition of wetlands into agrarian spaces

Are there reasons in support of urban agrarian activities Yes/No.?

1. If yes, what are these reasons?
2. If no?, Why are wetlands being converted into agrarian spaces in Kampala?
3. Are there particular means of land acquisition in wetlands in Kampala Yes, No
4. If yes what are these means? If not, how comes people own land in wetland areas of Kampala?
5. What are effects of industrialisation and urbanisation on wetlands in Kampala?
6. Has government come up with urban policies and regulations on wetlands in Kampala? Yes/No
7. If yes, what are these and how have they worked to regulate agrarian evolution on wetlands in Kampala?
8. If no, how comes some people are evicted on wetlands in Kampala?
9. How has climatic change worked towards population in wetlands of Kampala?
10. Has politics influenced increased wetland settlement in Kampala Yes /No

11. If yes, how has political influence increased settlement in wetlands of Kampala?

12. If no, how comes some people in wetlands refer to names of political figures as the main reason for wetland agriculture and settlement?

Section D: Impact of agrarian evolution on wetlands in Kampala

Are there existing impacts of agrarian activities on wetlands in Kampala?

1. What are impacts of agrarian activities in Kinawataka wetland?
2. What are impacts of agrarian activities in Lubigi wetland?
3. What are impacts of agrarian activities in Luzira wetland?
4. What are benefits of agrarian activities in Kinawataka wetland?
5. What are benefits of agrarian activities in Lubigi wetland?
6. What are benefits of agrarian activities in Luzira wetland

Thank you for participating

Tool 2: In-Depth Interview Guide (Residents of Kinawataka, Lubigi and Luzira wetlands)

Good morning/afternoon Sir/Madam. My name is Mubene Eriya, a student of Masters of Arts in history and an academic researcher from Kyambogo University conducting a study on "**Agrarian evolution on wetlands in Kampala district from 1900-2010".** In this research, the data collected and the results from the research will all be used for academic purposes but not for any other reasons. Some of the questions asked in this survey may be personal and sensitive and the language used may be explicit but this is because the study seeks to be clear on what specific information is being asked and the specific responses sought. I understand it may, in some cases, make you uncomfortable but that is not the intention of the survey. It is not a must to participate in this survey and feel free not to answer any questions that you feel absolutely uncomfortable answering.Some of the issues asked maybe delicate but we promise to protect your confidentiality and anonymity as the study responses will be summarized and analysed as a whole to further reduce the risk of identifying any answers to any respondents.

For purposes of recalling the entire conversation, I request to record.

Do you agree that I start the interview and the recording? Yes/No

SECTION A: Bio-data

1. What is your gender pronoun? Or what is your sex?
2. How old are you? By range 18-25, 26-30, 31-50, 51+
3. What is your level of education?
4. For how long have you lived in this wetland?
5. What is your main occupation or economic activity?
6. Where do you stay? Probe for the cell, ward, T/C, Sub-County, County and district.
7. What is your current marital status?

SECTION B: Genesis of agrarian evolution on wetlands in Kampala district

1. As a community/resident, have you ever used this wetland for agricultural purposes? Yes/No. If yes, what type of farming and crops do grow? Probe for the type of farming and the crops grown in wetlands

2. Do you think agrarian practises are still relevant in this wetland? Yes/No. If yes, how are they relevant? If no, why are they not relevant?
3. How did you come to stay in this wetland and when?

Section C: Reasons for rapid transition of wetlands into agrarian spaces

Are there reasons in support of urban agrarian activities Yes/No.?

1. If yes, what are these reasons?
2. If no? Why are wetlands being converted in agrarian spaces?
3. Are there particular means of land acquisition on in wetlands in Kampala Yes, No
4. If yes what are these means? If not, how comes people own land in wetland areas of Kampala?
5. What are effects of industrialisation and urbanisation on wetlands in Kampala?
6. Has government come up with urban policies and regulations on wetlands in Kampala? Yes/No
7. If yes, what are these and how have they worked to regulate agrarian evolution on wetlands in Kampala?
8. If no, how comes some people are evicted on wetlands in Kampala?
9. How has climatic change worked towards population in wetlands of Kampala?
10. Has politics influenced increased wetland settlement in Kampala Yes /No

Section D: Impact of agrarian evolution on wetlands in Kampala

Are there existing impacts of agrarian activities on wetlands in Kampala?

7. What are impacts of agrarian activities in Kinawataka wetland?
8. What are impacts of agrarian activities in Lubigi wetland?
9. What are impacts of agrarian activities in Luzira wetland?

Thanks for participating in this study

Tool 3: FDG Guide (The elderly above 50 years)

Good morning/afternoon Sir/Madam. My name is Mubene Eriya, a student of Masters of Arts in history Kyambogo University and an academic researcher from Kyambogo University conducting a study on "**Agrarian evolution on wetlands in Kampala district from 1900-2010".** In this research, the data collected and the results from the research will all be used for academic purposes but not for any other reasons. Some of the questions asked in this survey may be personal and sensitive and the language used may be explicit but this is because the study seeks to be clear on what specific information is being asked and the specific responses sought. I understand it may, in some cases, make you uncomfortable but that is not the intention of the survey. It is not a must to participate in this survey and feel free not to answer any questions that you feel absolutely uncomfortable answering. Some of the issues asked maybe delicate but we promise to protect your confidentiality and anonymity as the study responses will be summarized and analysed as a whole to further reduce the risk of identifying any answers to any respondents.

For purposes of recalling the entire conversation, I request to record.

Do you agree that I start the interview and the recording? Yes/No

Section A: Identification Information

1. Location/venue:	
2. Date:	
3. Category of participants (Wetland areas):	
4. Numbers of participants	
5. Time start:	
6. Time end:	
7. Facilitator	
8. Note taker:	

Section B: Background Information for participants (to be recorded on separate sheets)

- Gender pronoun Or sex
- Age by range 50+
- Level of education
- Length of period of living in wetlands
- Main occupation or economic activity
- Residence in form of cell, ward, T/C, Sub-County, County and district.
- Current marital status

Section C: Genesis of agrarian evolution on wetlands in Kampala

1. As an elder in this community, do you think people use wetlands for agriculture? Yes/No. If yes, How did people come to use wetlands for agriculture (probe for the reasons for the genesis of agrarian evolution on wetlands in Kampala)
2. Where wetlands in pre –colonial Buganda also used for agriculture purposes? Yes/No. If yes, how were they carrying agriculture in a manner that conserved them?
3. If no, how did agriculture begin in wetlands in pre-colonial Buganda?
4. Did farmers grow all crops in wetlands? Yes/No. If yes how did some crops survive that environment?
5. If no, which particular crops were grown in wetlands?
6. Did colonial administration introduce any change on wetland use? Yes/No .If yes what are they and how are affecting people who live there?
7. Did post-colonial period increase on wetland encroachment in Kampala Yes /No .If yes, what caused this increase?

Section D: Reasons for rapid transition of wetlands into agrarian spaces

Are there reasons in support of urban agrarian activities Yes/No.?

1. If yes, what are these reasons?
2. If no? Why are wetlands being converted in agrarian centres?
3. Are there particular means of land acquisition on in wetlands in Kampala Yes, No

4. If yes what are these means? If not, how comes people own land in wetland areas of Kampala?
5. What are effects of industrialisation and urbanisation on wetlands in Kampala?
6. Has government come up with urban policies and regulations on wetlands in Kampala? Yes/No
7. If yes, what are these and how have they worked to regulate agrarian evolution on wetlands in Kampala?
8. If no, how comes some people are evicted on wetlands in Kampala?
9. How has climatic change worked towards population in wetlands of Kampala?
10. Has politics influenced increased wetland settlement in Kampala? Yes /No
11. If yes, how has political influence increased settlement in wetlands of Kampala?
12. If no, how comes some people in wetlands refer to names of political figures as the main reason for wetland agriculture and settlement

Section E: Impact of agrarian evolution on wetlands in Kampala

Are there existing impacts of agrarian activities on wetlands in Kampala? Yes/No

If yes,

1. What are impacts of agrarian activities on this wetland?
2. What are the benefits of agrarian activities on wetland?
   If not, how do you relate with these wetlands in line with farming?

Thanks for participating in this study

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Department of History

7th May, 2019

TO WHOM IT MAY CONCERN

Dear Sir/Madam

INTRODUCTION LETTER

This is to introduce to you Mr. Mubene Eriya, Registration Number 17/U/14411/GMAH/PE, who is a Master student of Masters of Arts in History. He is conducting his research on a topic titled:

Agrarian Evolution on wetlands in Kampala District from 1900 to 2010.

Any assistance rendered to him will be highly appreciated.

Thank you

Yours faithfully,

KYAMBOGO UNIVERSITY
HISTORY & POLITICAL SCIENCE DEPT.
- 7 MAY 2019
P. O. BOX 1, KYAMBOGO

Magezi James (PhD)
Ag. Head of Department