

**URBANISATION AND ENVIRONMENTAL MANAGEMENT IN NEWLY CREATED
TOWN COUNCILS IN UGANDA, A CASE OF MBARARA DISTRICT**

BY

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SEPTEMBER, 202

DECLARATION

I, **Byaruhanga Arthur**, declare that this research dissertation titled: "*Urbanization and Environmental Management in Newly Created Town Councils in Uganda; a case Study of Mbarara District*" is my original work and has never been submitted to any University or Institution of higher learning for any award.

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APPROVAL

We certify that this dissertation has been done and compiled under our supervision and is submitted with our approval.

Sign.....



Date.....

25/9/2024

Assoc. Prof Gershom Atukunda

Sign.....



Date.....

25/9/2024

Mr. Nuwagaba Elias

DEDICATION

This dissertation is dedicated to my dear parents who have encouraged and believed in me always that I can move a mile further in all aspects of life.

To my family, my wife, Mrs Katusiime Sulaina and my children (Harry, Harriana, Hanna, Tatiana, Thierry and Tiara) for the encouragement, love and patience during the time I was undertaking this study

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LIST OF ACRONYMS

BSU	Bishop Stuart University
EAP	East Asia and Pacific
ECA	Eastern Europe and Central Asia
EMPs	Environmental Management Plans
GDP	Gross Domestic Product
GGGI	Global Green Growth Institute
GKMA	Greater Kampala Metropolitan Area
MAPAM	Master's Degree in Public Administration and Management
MENA	Middle East and North Africa
NDP	National Development Plans
NEAP	National Environmental Action Plan
NEMA	National Environment and Management Authority
NUA	New Urban Agenda
NUP	National Urban Policy
SDGs	Sustainable Development Goals
UGGDS	Uganda Green Growth Development Strategy
UN	United Nations
UNDP	United Nations Development Programme

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ABSTRACT

The study was about Urbanization and Environmental Management in Newly Created Town Councils in Uganda; a case Study of Mbarara District. It was guided by four research objectives. These were to; examine the current trend of Urbanization and environment management in Mbarara district, assess the effect of urbanization on environment management, assess the current laws governing environmental management and identify the challenges experienced in environmental management and suggest possible mechanisms for addressing environmental management gaps in Mbarara District.

The study adopted both a descriptive and cross-sectional study designs. Both qualitative and quantitative research approaches were used. The study population consisted of the Chief Administrative Officer, the Deputy and Assistant CAO, Senior Assistant Secretaries, and Parish Chiefs, Political Leadership, the District Councilors, the District Environment Committee Members and the Local Community Members. A sample of 133 respondents was relied on for the study. Both simple random and purposive sampling were used to select the sample. Questionnaires, interview guides and observation checklists were used to collect data. Data was analysed using SPSS version 22.0 and presented using statistical tables.

Majority of the respondents (90percent) believed that urbanization has significantly increased, 77percent of respondents observed a notable reduction in green spaces due to urbanization and 78percent of respondents believe that urbanization in Mbarara district is characterized by better infrastructure. Also, 75 percent of the respondents believed that development activities have hurt the environment's value. 72 percent of respondents believe there is a lack of environmental policies and regulations as a significant concern and 48 percent of respondents believe that the National Environmental Action Plan (NEAP) provides a framework for addressing

environmental management gaps and 75 percent of respondents stated that increasing public education and awareness is crucial in addressing environmental management gaps.

The study concluded that the rapid urbanization in newly created town councils in Mbarara District presents both significant challenges and opportunities for environmental management. While urban growth brings economic and social benefits, it also imposes pressures on land use, pollution control, and infrastructure.

The study recommended a need to regularly review and update environmental regulations to address the challenges posed by urbanization. Ensure that policies are robust and adaptable to rapid urban growth.

CHAPTER ONE

1.0 Introduction

This chapter consists of the background, purpose of the study, problem statement, objectives, research questions, scope of the study, Significance and the Conceptual framework.

1.1 Background of the Study

Urbanization entails the conversion of uninhabited or sparsely populated areas into densely populated cities. The expansion of urban areas can occur due to population growth or migration into these areas (Abd-Elmabod et al., 2019). This process often leads to the clearing of forests, destruction of natural habitats, and depletion of freshwater reserves from the ecosystem, resulting in reduced biodiversity and changes in species distributions and interactions (Atkinson & Davila, 2019). Additionally, human activities within urban settings, such as the combustion of fossil fuels and the discharge of industrial waste, contribute to increased environmental pollutants that can adversely affect both human health and other species (Saurav et al., 2021).

As outlined in the UN habitat report (2022), the climate crisis and the imperative to limit global average temperature rise to under 1.5 degrees Celsius, while preventing mass extinction, have become paramount concerns across governance levels. Cities persist in leading environmental and sustainability efforts, yet, following a decade of optimism, their capacity to shape sustainable urban futures is now subject to growing scrutiny by the public, particularly among younger generations who feel a pressing sense of urgency driven by concerns for their future. In summary, the envisioned achievement of sustainable urbanization remains elusive (Seifollahi et al., 2022).

The New Urban Agenda is intricately linked with the 2030 Agenda for Sustainable Development. Recognizing that the Sustainable Development Goals (SDGs) represent a broad

framework necessitating a more detailed action plan, the New Urban Agenda offers a spatial blueprint for achieving several of these goals and targets (UN Habitat Report, 2022). Within this context, urgent appeals for addressing the climate and biodiversity crises underscore the imperative to forge sustainable urban trajectories. The task for diverse stakeholders is to envision pathways toward livable urban environments for humans without exacerbating environmental deterioration (Price, 2019). However, numerous uncertainties shape environmental endeavors. Amidst the Anthropocene epoch, it's essential to acknowledge humanity's profound impact on the planet, which carries implications for both human societies and ecosystems. Previous iterations of the UN-Habitat World Cities Report have contended that opportunities exist to leverage the benefits of sustainable urbanization to propel forward green, resilient, and more equitable futures (Onifade et al., 2021).

As of 2011, the global population had reached 7 billion (Population Reference Bureau, 2013). Presently, the world is witnessing the most substantial urbanization boom in history, with over half of the global population living in urban regions. Projections indicate that by 2030, this number will rise to 5 billion, primarily driven by urban expansion in Africa and Asia (United Nations Organization, 2011). The recent surge in the global population has amplified the impacts of agricultural and economic endeavors. However, amid this population surge, a potentially more noteworthy human-environmental dynamic is unfolding: as the world population doubles, urban populations are tripling. It is anticipated that within the coming years, over fifty percent of the world's population will reside in urban regions (Seifollahi-Aghmiuni et al., 2022).

In Uganda, the urbanization trend mirrors global patterns but presents unique challenges and opportunities. The National Environment and Management Authority (NEMA) Report on the

State of the Urban Sector 2021-2022 highlights that Uganda is experiencing a significant rate of urban expansion, posing a substantial threat to wetland ecosystems and other natural resources. In particular, Mbarara City, located in southwestern Uganda, exemplifies the rapid urbanization seen across the country. Once a modest town, Mbarara has transformed into a bustling urban center, leading to increased pressure on land and water resources, exacerbating environmental degradation, and impacting local biodiversity (NEMA, 2021).

The Uganda Vision 2040 serves as a comprehensive national development roadmap, acknowledging the pervasive impact of climate change across all segments of the economy, the environment, and society. It emphasizes the need to incorporate climate change governance into development planning and strives to elevate Uganda from its current status as a predominantly low-income nation to a competitive upper-middle-income country. To operationalize this vision, the country has formulated three successive National Development Plans (NDP) (Bananuka et al., 2021).

The National Urban Policy (NUP) in Uganda outlines several policy statements and strategies aimed at addressing key challenges within the country's urban sector. This policy introduces criteria for the establishment and enhancement of urban areas, along with a hierarchy of urban and rural settlements (Muheirwe et al., 2022). Recognizing Uganda's rapid urbanization, with projections indicating that by 2050, half of the nation's population will reside in urban areas, the NUP is designed to manage this transformation. It also contributes to ongoing environmental management discussions and concerns that have persisted in the country for the past four decades (Bananuka et al., 2021). However, the integration of environmental issues into policy formulation did not gain momentum until the 1980s, when a robust Civil Society Organization community emerged to advocate for environmental conservation amidst Uganda's burgeoning

development. Pressures stemming from population growth and diminishing resources underscored the relevance of environmental concerns in the country's development agenda (George et al., 2020).

The government has established directives for the Environment and Natural Resources (ENR) non- wage conditional grant, designed to support district local governments in implementing prioritized programs and projects within the sector. These endeavors are collaboratively determined by the Ministry of Water and Environment and the local governments. The allocated funds are designated for monitoring projects to ensure adherence to policies, laws, and regulations, as well as for the management of diverse ecosystems such as hilly and mountainous regions, forests, wetlands, riverbanks, lakeshores, and rangelands (Isse, 2023).

Challenges and prospects in environmental management abound, as the persistent reliance on natural resources coincides with a notably rapid pace of urbanization. This has resulted in the proliferation of numerous industries in and around major water bodies, alongside significant alterations in land use and cover around cities and towns (Kasei et al., 2019). While this phenomenon is often referred to as urban explosion, there also exists urbanization by implosion, characterized by higher population densities in certain rural areas or trading centers surpassing those in established urban hubs. In conjunction with other human activities, urbanization has contributed to heightened eutrophication and pollution of major water bodies, while escalating resource consumption is expanding the urban ecological footprint (George et al., 2020).

As per Article 237(2b) of the 1995 Constitution, it is the responsibility of the Government or local government, as designated by Parliament, to hold in trust and safeguard various natural assets such as lakes, rivers, wetlands, forest reserves, game reserves, national parks, and any

other land set aside for ecological and touristic purposes. This responsibility aims to serve the collective welfare of Uganda's citizens. Additionally, the Local Government Act of 1997 decentralizes powers to local governments, including the management of natural resources, thereby assigning the stewardship of natural resources as a responsibility of local governments (Tumwesigye et al., 2023).

The rapid urbanization of Mbarara district has significantly transformed its landscape, giving rise to extensive built-up areas alongside small-scale agricultural plots. This dual development has led to serious consequences, including land fragmentation and the emergence of informal settlements, often referred to as slums. As a result, the district faces critical environmental challenges, with approximately 41 percent of its total land area experiencing varying degrees of degradation. Alarming, about 12 percent of this area is in a state of severe degradation, highlighting the urgency of the situation. Furthermore, Mbarara district has witnessed a significant loss of wetlands, with over 15,000 hectares having been encroached upon in recent years (Mbabazi & Atukunda, 2020). Wetlands play a critical role in maintaining ecological balance, providing habitat for diverse species, and acting as natural water filters. Their degradation not only threatens biodiversity but also compromises the natural flood control and water purification services that wetlands provide.

The urbanization of newly created town councils in Mbarara district poses critical questions about sustainable development, environmental management, and the balancing of urban growth with ecological conservation. The Uganda Vision 2040 and the Uganda Green Growth Development Strategy (UGGDS) 2017/28-2030/31 emphasize the need to integrate climate change governance into development planning to elevate Uganda to a competitive upper-

middle-income country. This vision underscores the importance of promoting green, resilient, and sustainable urban growth (Kakuba & Kanyamurwa, 2021).

This study aims to investigate the environmental impacts of urbanization in Mbarara district and propose sustainable urban planning strategies that can mitigate these impacts. By examining the local context, identifying key areas of degradation, and engaging with stakeholders, the study seeks to develop actionable recommendations for promoting sustainable urbanization in the area. The focus will be on enhancing environmental management practices, protecting natural resources, and ensuring that urban growth contributes positively to the well-being of the community and the ecosystem.

1.2 Problem Statement

Urbanization remains a major important tool of development. This is because urbanization has the potential to become a positive transformative force for every aspect of sustainable development, including the reduction of inequality (Adebayo et al., 2021). When properly planned and managed, urbanization can reduce poverty and inequality by improving employment opportunities and quality of life, including through better education and health. Also, Aladejare (2023) notes that the process of urbanization is also the goal of modernization that results in the development of the world economy, and contributes the emerging level of industrialization.

Additionally, environmental conservation helps to maintain the survival of humans, animals, and plants, as well as preserve nature for the future, reduces the negative impact of industrial activities on the environment, leading to a healthier planet and improved daily lives. Additionally, protecting the environment can prevent material waste, thus reduce pollutant

emissions and minimize the environmental impact of plants in a region (Akubia et al., 2020).

However, the increased urbanization rate has severely degraded the environment. According to Musingwire et al., (2019) the extent of environmental damage in Mbarara District is so big in that reversing it would require a lot of efforts not only from the government but also community members, development partners and non-governmental organization. For example, the growth of Rubindi town council has led to encroachment of a wetlands that were originally crucial sources of water in the area (Mbarara District Development Plan, 2020/2021). Thus, wetlands in areas around urban areas in Mbarara district have been cleared because of population pressure resulting from urbanisation.

This serious environmental damage have not only affected the quality of water in available water bodies but has as well affected the flora, fauna and air. Failure to address the situation could lead to increased poverty, overcrowding, famine, weather extremes, species loss, acute and chronic medical illnesses and human rights abuses (Kwiringira et al., 2021). Efforts from the National Environment Management Authority, development partners, non-governmental organizations and the local authorities have instituted laws, carried out sensitization and carried out evictions of people in wetlands. However, the rate at which the environment is being damaged continues to accelerate (Mbabazi & Atukunda, 2020). It was thus important that the study be conducted on Urbanization and Environmental Management in Newly Created Town Councils of Mbarara district.

1.3 Objectives of the Study

1.3.1 General Objective

To examine the effect of urbanization on environmental management in newly created town

councils in the Mbarara district.

1.3.1 Specific Objectives

- (i) To examine the current trend of Urbanization and environment management in Mbarara district
- (ii) To assess the effect of urbanization on environment management in Mbarara district
- (iii) To assess the current laws governing environmental management in Mbarara District.
- (iv) To identify the challenges experienced in environmental management and suggest possible mechanisms for addressing environmental management gaps in Mbarara District.

1.4 Research questions

- (i) What is the current trend of Urbanization and environment management in Mbarara district?
- (ii) What is the effect of urbanization on environment management in the Mbarara district?
- (iii) What are the current laws governing environmental management in Mbarara District?
- (iv) What are the challenges experienced in environmental management, and possible mechanisms of addressing environmental management gaps in Mbarara District?

1.5 Scope of the Study

1.5.1 Content Scope

The study examined the current trend of urbanization and environment management, assessed the effect of urbanization on environmental management and assessed the current laws, challenges experienced in environmental management and suggested possible mechanisms of addressing environmental management gaps in Mbarara District.

1.5.2 Geographical Scope

The research was conducted in Mbarara District, located in South Western Uganda. Mbarara

District shares borders with Ibanda District to the North, Kiruhura District to the East, Mbarara city to the South East, Rwampara District to the South West, Sheema District to the West, and Buhweju District to the North West. The district headquarters, situated in Mbarara, the largest city in the sub-region, is approximately 290 kilometers (180 mi) southwest of Kampala, Uganda's capital city, and largest metropolitan area. The coordinates of the district are: 00 36S, 30 36E. Mbarara District comprises one County (Kashari) with two constituencies (Kashari North and South). It includes six sub-counties: Rubindi, Bubaare, Bukiro, Kashare, Kagongi, and Rubaya. Additionally, Mbarara District encompasses five Town Councils: Bwizibwera - Rutooma, Rwanyamahembe, Bukiro, Rubindi, and Nyabisirira (Mbarara District Statistical Abstract, 2020/2021).

1.5.3 Time Scope

The study relied on data for a period of 10 years. This was from 2012 to 2022. The researcher considered this period because it coincided with the serious destruction of the environment including wetlands and water sources. The researcher analyzed the urbanization dynamics and how they influenced environmental management over this period.

1.6 Significance of the Study

The findings of the study may be of great value to several stakeholders;

Policymakers. The study may be useful to the policy makers for example the National Environmental Management Authority and the Ministry of Planning and Economic Development to get more insight into how the various urbanization dynamics have resulted in environmental degradation. This may be important in designing long-lasting solutions to the problem of environmental degradation.

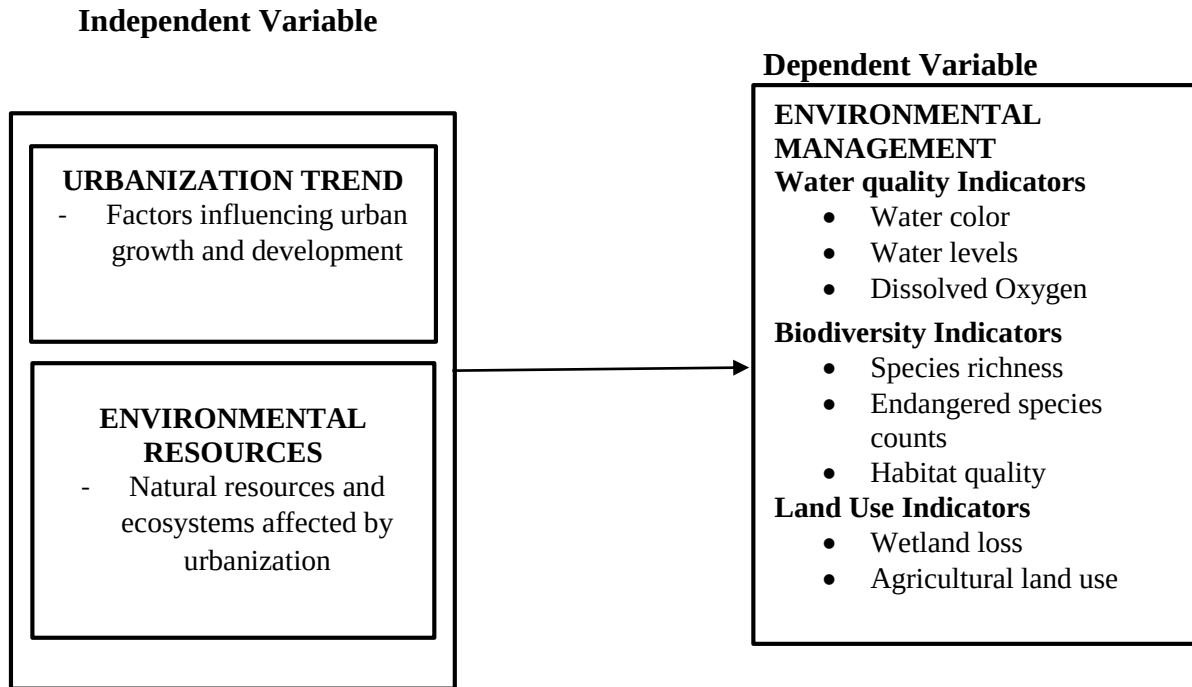
The local community members in the district may be able to know the extent of environmental damage and the effect it has had on their social and economic livelihood. This may thus make it easy for the people to appreciate government programs aimed at minimizing population growth for example family planning.

To the district authorities particularly the District Environment Committees, the study may be a basis for conducting environmental Impact assessment surveys that are always relied on for planning purposes.

Academicians may hopefully use the findings of this study as a preamble for further research studies in the field of population studies. It may act as a basis from which future researchers can draw ideas. It may hopefully form a source of understanding of the extent to which population growth has affected the environment.

To the researcher, the study will hopefully help him to acquire a master of public administration and management since it is a requirement by Bishop Stuart University.

1.7 The Conceptual Framework



Source: UNDP, 2023, Modified by the Researcher

The conceptual framework for this study on urbanization and environmental management in Mbarara District integrates independent variables, intervening variables, and dependent variables to explore the complex dynamics at play. Urbanization trends and environmental resources serve as independent variables, influencing the development and utilization of natural and built environments within the district. Intervening variables such as the legal and policy framework and compliance measures act as mediating factors, shaping the implementation and effectiveness of environmental management practices. The study focuses on dependent variables including environmental degradation indicators and socio-economic impacts, assessing the extent to which urbanization impacts the environmental quality and community well-being in Mbarara District. This structured framework guides the research in analyzing

relationships, identifying challenges, and proposing strategies to enhance sustainable urban development and environmental stewardship in the region.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews scholarly articles, books, journals, dissertation abstracts, government documents, policy reports, magazines, and papers presented at conferences on urbanization and environmental management in newly created town councils in Uganda.

2.1 Theoretical Review

2.1.1 The Sector Model

The Sector Model, developed by Homer Hoyt in 1939, is an influential urban planning theory that posits that cities develop in a series of sectors or wedges rather than concentric circles. The model suggests that urban areas expand outward from the central business district (CBD) in specific sectors. Each sector is characterized by different land uses, such as residential, commercial, and industrial areas. Hoyt emphasized the role of transportation routes in shaping urban growth. The Sector Model provides a valuable framework for understanding urban growth patterns, emphasizing the interconnectedness of transportation, land use, and environmental outcomes. By applying the principles of this model, urban planners can create more sustainable, livable cities that prioritize environmental health while accommodating growth and diversity.

Why developing the theory, Hoyt considers the effect that urbanization could have on the environment. He thus highlights the importance of planning for mixed land uses. For example, he notes that by clustering residential, commercial, and industrial areas, planners can minimize transportation needs and reduce reliance on cars, thus lowering emissions. This is important in minimizing the effects of air pollution amidst urbanization and increased human activity. The

conceptual framework in the study underscores the immediate effect of urbanization on the environment including air quality. The Sector Model theory notes that planners can prioritize the inclusion of green spaces within sectors. This not only enhances the aesthetic appeal but also contributes to biodiversity, air quality, and recreational opportunities for residents.

2.1.2 The Dependency Theory

The dependency theory emerged in the mid-20th century, primarily associated with scholars like Andre Gunder Frank and Immanuel Wallerstein. It explains that rapid urban growth in developing countries often stems from: Rural-to-Urban Migration as people move to cities seeking better economic opportunities, often due to agricultural decline influenced by global market pressures. Also, the theory suggests that rapid urban growth comes from the global economic structures; urban centers become focal points for export-oriented industries and foreign investment, leading to concentrated urban growth. The theory however, does not leave the effect of urbanisation on environment unscratched. It emphasises that cities in developing countries often experience uncontrolled growth, leading to inadequate infrastructure such as waste management, transportation, water supply. This lack of infrastructure contributes to significant environmental challenges. Also, it notes that rapid industrialization, often driven by foreign investments, can lead to significant air and water pollution. This is because factories may be allowed to operate without stringent environmental regulations, resulting in harmful emissions and waste.

The theory of dependency also gives the shape of the study for example, the conceptual framework in the study bring out clearly the effect of urbanization on environmental aspects including air and water. The fact that the theory, also suggests that dependency on resource extraction to fuel urban growth can lead to deforestation, loss of biodiversity, and depletion of

local resources, clearly shows how urbanization can prove to be a disaster to the environment. In relation to the conceptual framework, the theory highlights the complex relationship between urbanization and environmental challenges. By understanding these dynamics, policymakers can work towards creating more equitable and sustainable urban environments, focusing on strengthening local capacities and promoting sustainable development that addresses environmental needs.

2.2 The Current Trend of Urbanization

In the future, we can anticipate more and larger cities. In 1900, only 10percent of the global population resided in urban areas. Today, this proportion has exceeded 50percent, and projections suggest it will rise to 75percent by 2050 (The Urban Age Project, London School of Economics) (Qian et al., 2022). As of 2010, the number of individuals living outside their country of birth surpassed 200 million, contributing to the growing diversity of cities as they attract residents from various national, cultural, and religious backgrounds. Young people, who perceive urban areas as offering greater opportunities to fulfill their aspirations compared to rural areas (Tuan, 2022), primarily drive the trend of urban migration.

Metropolitan areas are increasingly pivotal to national economies, serving as hubs of wealth accumulation. Rather than focusing solely on the 200 nations, attention has shifted to the 600 cities identified as the driving force of the global economy (McKinsey & Co). Looking ahead, cities will vie with nations for investment, talent, and influence, as highlighted by Nigussie & Altunkaynak (2019). To succeed in this competitive landscape, cities must demonstrate their appeal to both residents and investors by providing a secure and inviting environment. Failure to implement effective strategies may have severe repercussions, given the escalating significance of cities in national affairs (Chien et al., 2022).

Between 1991 and 2011, a significant transformation unfolded in low- and middle-income countries across Europe and Central Asia, with more than half of these nations experiencing a notable decline in urban populations (Wilke et al., 2019). This demographic shift presents a complex narrative shaped by several interrelated factors, particularly the aging population dynamics unique to the region. The aging trend in Eastern Europe and Central Asia (ECA) is primarily driven by decreasing fertility rates, rather than improvements in longevity. This contrasts with aging trends observed in other parts of the world, where increased life expectancy often accompanies population aging. In ECA, the decline in birth rates has led to a shrinking youth demographic, which, combined with the outmigration of young individuals seeking better opportunities elsewhere, further compounds the challenges faced by urban centers. Young people are increasingly moving to more prosperous regions or countries, leaving behind an older population that struggles to sustain the vitality of urban areas.

As a result, cities within ECA are poised to experience divergent growth patterns. Major urban centers may initially witness some growth due to remaining young populations and ongoing urbanization, yet they will also face the pressing issue of an aging demographic. This duality can lead to an acceleration of population aging, with a greater proportion of older adults in these urban areas. Cities may find themselves grappling with the need to adapt their infrastructure and services to meet the demands of an aging population, which often requires enhanced healthcare, accessible transportation, and social support systems. In the broader context, the implications of these demographic shifts are profound. The decline in urban populations and the simultaneous aging of those who remain may lead to economic stagnation in some regions, as labor markets contract and consumer bases shrink. Furthermore, the cultural fabric of these cities could be

altered, as communities may become less diverse and vibrant with fewer young people contributing to local economies and social dynamics (Sampson et al., 2020).

Latin America and the Caribbean stand out as one of the world's most urbanized regions, achieving an urban majority as early as 1960, a milestone that the global community reached only in 2008. Presently, the average growth rates in cities are diminishing, with certain urban cores experiencing population declines as residents move to the urban periphery. Urbanization is gradually gravitating towards smaller and mid-sized cities. Notably, the region is undergoing a rapid aging process, particularly conspicuous within urban settings (Zimmerer et al., 2022).

The Middle East and North Africa (MENA) region is already experiencing a high level of urbanization, with 64percent of its population residing in urban areas. While a substantial portion of the region's future urban growth is expected to occur in its major cities, there is also a significant projected growth in secondary cities, albeit at a faster rate in relative terms (Yao et al., 2021). Unique factors such as conflict-induced displacement, climate-driven migration, and cross-border movement in pursuit of economic opportunities are shaping urbanization trends in certain countries within the region, diverging from typical patterns. Although aging is not currently a prominent issue in MENA, demographic shifts indicate a rapid increase in the elderly population in the coming decades. Concurrently, the region's significant youth population presents a demographic dividend that, if effectively managed, could contribute to higher growth rates, particularly in urban areas (Sumari et al., 2020). Therefore, understanding and addressing the implications of these demographic shifts are crucial for sustainable urban development and socio-economic advancement in the MENA region.

In South Asia, a combination of factors such as increasing life expectancy, decreasing fertility

rates and low ratios of old-age dependency has led to the emergence of a "youth bulge" generation. This demographic trend, characterized by a disproportionately large population of young individuals, presents unique challenges and opportunities for the region's socio-economic landscape (Jing et al., 2020). Notably, South Asia exhibits a skewed gender ratio, particularly evident in the lower number of female births compared to the global average, which could have far-reaching implications for future labor force dynamics and societal participation (Jing et al., 2020).

Contrary to popular belief, the growth of urban populations in South Asia is primarily fueled by natural population growth and internal reclassification rather than rural-to-urban migration. However, challenges such as congestion and inadequate urban management practices pose significant obstacles to the attractiveness of South Asian cities, potentially undermining their ability to serve as hubs for economic and social opportunities (Bosch et al., 2020). Addressing these issues is imperative for fostering sustainable urban development and maximizing the potential of South Asian cities in the face of demographic shifts and urbanization pressures.

The East Asia and Pacific (EAP) region is undergoing swift urban expansion, ranking second only to Sub-Saharan Africa in this regard. By 2018, EAP had achieved a 50percent urbanization rate, with a majority of urban dwellers located in secondary cities. Notably, the region hosts the highest elderly population among all global regions, although there exists considerable diversity in aging demographics across different nations within the region. These variations in aging patterns often align with the respective income levels of the countries. Migration is presumed to play a significant role in propelling the urbanization trajectory observed in the EAP region (Zhang et al., 2020).

The urbanization rate in Africa reached nearly 44 percent in 2021, marking a steady increase from

35 percent in 2000. This trend is anticipated to continue in the forthcoming years, indicating a progressive shift towards urban living across the continent. Nevertheless, there exists notable variability in the distribution of rural and urban populations within Africa. For instance, in 2019, Gabon and Libya emerged as the most urbanized nations in Africa, with each surpassing an 80 percent urbanization rate (Ali et al., 2019). In contrast, countries like Burundi and Niger exhibited a significantly lower urbanization rate, with only around 13 and 17 percent of their populations residing in urban areas, respectively. Overall, Africa's urbanization level remains lower than the global average, which stood at 56 percent in 2021. During that period, Africa, alongside Oceania, exhibited the lowest urbanization rates among all continents (Beckers et al., 2020).

The proportion of Africans residing in urban regions is expected to escalate from 36 percent in 2010 to 50 percent by 2030. This surge in urbanization, ranking as the highest globally, holds the potential for fostering economic expansion, facilitating transformative changes, and alleviating poverty across the continent. Conversely, it also harbors the risk of exacerbating inequality, amplifying urban poverty, and exacerbating the proliferation of informal settlements. Hence, the formulation of appropriate laws, policies, and interventions to harness the beneficial outcomes of Africa's urbanization process assumes paramount importance in steering the continent toward comprehensive transformation (Tulibaleka et al., 2021).

In Uganda, urbanization stands out as a prominent and dynamic trend, characterized by a rapid growth rate of 4.5 percent annually, poised to nearly double the urban population between 2010 and 2030. Currently, with 26 percent of its populace residing in urban areas, Uganda is witnessing swift urbanization alongside significant transformations in its urban landscape and overall land utilization. Notably, after Niger, Uganda claims the distinction of harboring the world's second-youngest population. This demographic composition, coupled with the potential youth dividend

and the rapid pace of urbanization, positions Uganda on a trajectory toward sustainable development (Tumwesigye et al., 2023). Nonetheless, certain developments cast doubt on whether the prevailing development trajectory will steer the country toward sustainable development, particularly concerning sustainable urbanization. These developments encompass adverse and fluctuating weather patterns, declining competitiveness of urban centers, the rapid influx of displaced populations into the country, and stagnating economic growth, among other factors (Tulibaleka et al., 2021).

In 2022, the proportion of Uganda's urban population saw a notable rise, increasing by 0.6 percentage points (+2.35 percent) compared to the previous year. Consequently, the urban population share in Uganda reached its pinnacle in 2022, reaching 26.16 percent. Remarkably, this share has exhibited a continuous upward trend in recent years. The urbanization rate of a country denotes the percentage of its total population residing in urban areas. Discrepancies in international comparisons of urbanization rates may arise due to variations in the definitions of urban centers, which may be based on criteria such as population size, geographic area, or spatial distribution of dwellings, among other factors (George et al., 2020).

2.3 The Effect of Urbanization on Environment Management

Human development endeavors yield numerous benefits for mankind, yet they also exert significant impacts on the environment. As previously noted by scholars, the environment holds profound importance for humanity and all other life forms (Wang et al., 2019). It facilitates various human activities, including agriculture, settlement, industry, and other forms of developmental pursuits. Globally, the sustainable utilization of environmental resources remains a subject of intense debate. While every individual on Earth aspires for development, environmental concerns

have often been marginalized within human development agendas (Liu et al., 2021). Consequently, this oversight has led to the degradation of environmental resources, which are essential for the well-being of both present and future generations. Regrettably, the value of the environment has been underestimated, resulting in human activities proceeding without due consideration for their environmental impacts (Pour et al., 2020).

Urbanization is commonly perceived as a developmental process characterized by the expansion and evolution of urban areas into fully-fledged cities. It entails the migration of individuals from rural to urban regions, drawn by the allure of enhanced amenities and opportunities. Urbanization fosters a range of activities that cater to human needs and preferences, including improved access to healthcare, education, and recreational services within urban settings. Moreover, urban centers serve as magnets for job seekers, further driving the influx of population. However, the burgeoning urban population brings about a host of challenges, such as heightened demand for housing, educational, and healthcare infrastructure, among other essential services crucial for human well-being. Additionally, the surge in urbanization necessitates the utilization of more resources such as water, land, and energy to sustain the burgeoning urban populace (Feng et al., 2021).

Since the inception of agriculture approximately 8,000 years ago, humans have initiated alterations to the landscape, and with the onset of the Industrial Revolution, our influence on the atmosphere became pronounced. The recent surge in global population has exacerbated the impacts of our agricultural and economic endeavors. However, perhaps overshadowing this demographic shift is another significant interaction between humans and the environment: while the global population is doubling, urban populations are tripling. It is projected that within the coming years, over fifty percent of the world's populace will reside in urbanized areas (Hoare et al., 2019).

The dynamics of urbanization are complex and multifaceted, influenced by a variety of social, economic, and environmental factors. In developing nations, the variations in urbanization rates reflect historical trends, economic opportunities, and political contexts. Latin America stands out as a region where urbanization has reached remarkable levels, with a significant majority of its population residing in urban areas. This shift has been driven by a combination of rural-to-urban migration and natural population growth, resulting in vibrant, densely populated cities that serve as economic and cultural hubs. Looking forward, East and South Asia are anticipated to witness unprecedented urbanization over the next three decades. Rapid economic growth, industrialization, and globalization are fueling this movement, as individuals and families seek better job prospects and improved living standards in urban centers. Cities like Mumbai, Jakarta, and Guangzhou are projected to expand dramatically, not only in population size but also in their role as critical nodes in global supply chains and centers for innovation.

Climate change stands to adversely affect critical economic and social infrastructures, potentially diminishing the quality of life in cities, where many of these facilities are concentrated. Particularly vulnerable to these impacts are the urban poor, including residents of informal settlements in developing nations, who often reside in areas prone to environmental hazards such as river banks, landslide-prone slopes, or polluted sites, and structurally unsound dwellings susceptible to seismic activity (Onifade et al., 2021). The escalating population density is driving up the urban ecological footprint in both developed and developing countries, leading to heightened consumption of natural resources like water, energy, and fossil fuels. The extravagant lifestyle of urban dwellers poses challenges to replenishing these resources promptly, resulting in issues such as water scarcity and power shortages due to excessive electricity usage (Fang et al., 2020).

Urban expansion has notably impacted water resources, particularly surface water bodies. The nexus between urbanization and industrial growth has contributed to the emergence of industries, some of which rely on access to water supply. However, this development has brought about adverse effects, including the discharge of industrial effluents into water bodies and excessive extraction of water for industrial purposes. Moreover, the growth of urban centers has led to an increase in waste generation, with some of this waste finding its way into nearby water bodies. For instance, the Nairobi River has become a dumping ground for waste due to the settlement of people along its banks. Similarly, River Migori has suffered from pollution resulting from the development of Migori town (Zhang et al., 2021).

In many contexts, water is regarded as indispensable for life. Humans, along with other organisms, rely on access to clean freshwater sources. Once water becomes contaminated, it poses health risks and is no longer safe for consumption. The pollution deposited into rivers as a consequence of urban development compromises water quality, endangering the aquatic organisms reliant on these rivers. These organisms suffer from the pollutants present in the waste, often resulting in their demise. This loss of biodiversity underscores the detrimental impact of urbanization on natural ecosystems. Additionally, the construction of pavements as part of urbanization efforts impedes water infiltration into the soil. This not only affects soil moisture and microorganisms but also disrupts groundwater recharge, crucial for sustaining the water cycle. When one stage of the water cycle is compromised, it disrupts the entire process. Water that fails to permeate the soil due to pavement construction may contribute to flooding events (Xu et al., 2020).

Urban development also leads to the over-extraction of groundwater resources. As surface water becomes contaminated and deemed unsafe for consumption, individuals turn to groundwater sources. Numerous boreholes are drilled to meet the escalating water demands of urban populations. This reliance on groundwater extraction disrupts the natural water cycle, particularly if done excessively. Additionally, urbanization gives rise to the establishment of drainage systems such as sewer lines. While these systems may not always have an immediate impact, they can cause significant repercussions on water quality when they rupture or leak. Sewage may contaminate both groundwater and surface water as it flows downstream, posing risks akin to those posed by improperly treated industrial effluents, which may contain harmful heavy metals detrimental to aquatic ecosystems (Wang et al., 2019).

Initial studies examining the correlation between urbanization and environmental pollution concentrated on the interaction among economic growth, population expansion, resources, and the environment. In 1991, economists Grossman and Krueger introduced the environmental Kuznets curve (EKC) hypothesis, proposing an inverted U-shaped relationship between environmental pollution and economic growth (Grossman and Krueger, 1995). Subsequent studies have confirmed this relationship in developed countries, demonstrating that population growth positively correlates with environmental pollution (Halder et al., 2021). However, urbanization is a multifaceted process encompassing population, economic, social, and spatial transitions. The influence of urbanization on environmental pollution fluctuates among countries and regions with varying developmental stages. Research exploring the effects of urbanization on energy consumption and carbon emissions demonstrates diverse results. Urbanization tends to decrease energy usage in low-income countries, while it increases in middle-income and high-

income nations. Additionally, urbanization has a positive impact on carbon emissions across all countries examined (Ali et al., 2019). Furthermore, studies have revealed a curvilinear relationship between urbanization and carbon emissions in developing nations, indicating an inverted U-shaped pattern. Meanwhile, the connection between the quality of urbanization and the ecological environment has demonstrated variation in particular urban areas (Song, 2019).

The adverse effects of urbanization on natural landscapes and habitats are expected to intensify rapidly in the future. Urbanization leads to the creation of artificial and impermeable surfaces, thereby altering land cover types and the biodiversity of ecosystems. Consequently, this can change the frequency and types of disturbance regimes and impact the flow of nutrients, organisms, energy, and water within and between landscapes (Zahoor et al., 2022). Habitat loss caused by urbanization, shifts in hydrology, sedimentation, water contamination, and changes in soil properties can profoundly affect aquatic ecosystems. The replacement of natural vegetation with impermeable surfaces and the introduction of environmental stressors through increased human activity can dramatically alter aquatic habitats. Urban aquatic systems, in particular, are highly affected by these changes due to their dense population and pollution levels (Sharma et al., 2020).

The conversion of urban land often results in unsuitable conditions for plant growth, with altered soil nutrient fluxes or deficiencies (Olajire et al., 2020). Soil, with its high capacity for retaining hydrophobic chemicals, may experience altered nutrient levels due to urbanization (Das et al., 2019). Moreover, elevated conductivity, indicative of dissolved metals and salts in water, has been found to negatively impact animal populations in urban areas (Aslam et al., 2020). Amphibians, for instance, exhibit reduced survival, growth, and development rates in urban environments due

to nitrogen pollution and heavy metal contamination (Tsalis et al., 2020). Overall, urbanization significantly alters natural ecosystems and poses a substantial threat to biodiversity, underscoring the importance of ecological research, management, restoration, and conservation efforts (Gilal et al., 2019).

Water temperature and dissolved oxygen are interconnected environmental factors essential for the survival of aquatic organisms and their ability to withstand certain pollutants. Significant industrial facilities such as power plants utilize water for cooling, and the release of this water can affect downstream habitats. Reduced levels of dissolved oxygen indicate eutrophication, a situation where water quality declines, resulting in the death of organisms (Singh et al., 2019). High turbidity, associated with eutrophication, prevents sunlight from penetrating dense, grayish water, resulting in excess organic material and decreased oxygen levels. Phosphorus, a pollutant, is a leading cause of eutrophication in aquatic systems. Soil phosphorus enters aquatic environments via eroded soil particles and surface runoff, exacerbating the issue (Taylor et al., 2020).

Water pH, conductivity, and salinity are also linked to dissolved oxygen levels. pH can be influenced by waterborne chemicals, and maintaining stable pH levels within certain parameters is vital for organism survival and thriving. Fluctuations in pH values can affect species abundance and interactions (Goodland, 2019). The quantity of dissolved solids impacts water conductivity, which can affect its suitability for various uses, including domestic, industrial, and agricultural purposes. Elevated specific conductance levels may affect drinking water taste and odor and cause gastrointestinal issues. Similarly, high salinity can inhibit crop survival. Impervious surfaces may contribute to nutrient loss, high salinity, increased conductivity, and alterations in pH and dissolved oxygen levels (Muheirwe et al., 2022).

Human-induced changes in water quality parameters such as salinity, conductivity, dissolved oxygen, and temperature have been shown to significantly impact species survival and the dynamics of species interactions within aquatic ecosystems (Edodi, 2023). These alterations often stem from various anthropogenic activities, including industrial discharges, agricultural runoff, and urbanization, which can introduce pollutants and disrupt natural hydrological cycles. By contrasting aquatic environments in urban settings with those in adjacent rural areas, researchers can uncover critical patterns in environmental factors that contribute to the deterioration of water quality. Urban areas often experience higher levels of nutrient loading, increased salinity due to runoff from roads and infrastructure, and changes in temperature caused by urban heat islands. In contrast, rural areas may benefit from lower levels of pollution and more stable water conditions, providing a more conducive environment for diverse aquatic life.

Urban development entails the clearance of vegetation to make way for settlements, subjecting the land to erosion agents. Vegetation cover plays a crucial role in controlling soil erosion and infiltration rates, moderating water flow speed, contributing to the hydrological cycle, acting as a carbon sink, and enhancing aesthetic value (Juma et al., 2022). However, urban population growth necessitates the creation of more housing, leading to increased vegetation clearance. Vegetation also serves as a habitat for various life forms, and its destruction results in habitat loss and displacement of animals (Ndanyi, 2021). Agricultural activities in peri-urban and rural areas, driven by the demand for food in urban centers, further exacerbate land cover loss and soil degradation (Nigussie & Altunkaynak, 2019).

Urbanization significantly transforms land use patterns, often resulting in the conversion of recreational open spaces into densely built environments. This shift has profound implications for biodiversity, as natural habitats are increasingly fragmented or entirely displaced. The

encroachment of urban development on green spaces not only diminishes the area available for native flora and fauna but also disrupts the ecological processes that sustain biodiversity. For example, a study conducted in Nairobi in 2017 highlighted the rapid changes in land use and land cover driven by urban development (Chien et al., 2022). In this vibrant city, once-lush parks and open areas have been transformed into residential and commercial zones, leading to a decline in habitat availability for various species. This phenomenon is particularly concerning in urban ecosystems, where remaining green spaces often serve as critical refuges for wildlife, offering essential resources like food, shelter, and breeding grounds.

2.4 The Challenges Experienced in Environmental Management due to Created Town Councils

The trend towards adopting sustainable development principles to mitigate climate change is growing. Key tenets of sustainable development encompass enhancing people's quality of life, promoting health, and safeguarding natural resource systems within a country. Consequently, governments have initiated measures to incentivize construction projects to incorporate environmental management plans (EMPs). Despite the construction industry's significant contribution to economic growth, its practices often have detrimental effects on the environment and society (Wilke et al., 2019).

Construction projects consume substantial energy and natural resources while generating significant air, water, noise, and land pollution. Moreover, construction and demolition waste produced by the sector adversely impacts the environment, economy, and public health (Sampson et al., 2020). These issues pose challenges to various external stakeholders. Ground surface disturbances resulting from construction activities notably escalate pollution damage, with

clearing and excavation leading to soil erosion and sedimentation, perpetuating environmental degradation. Furthermore, the conversion of steep mountainous land into arable land exacerbates erosion and sedimentation issues due to terrain alterations. Hence, without effective EMPs, the construction industry's adverse environmental impact will remain a serious global threat (Zimmerer et al., 2022).

Despite the imperative for more efficient management of construction activities' environmental impact, project stakeholders often lack conscious awareness and understanding of EMP implementation (Yao et al., 2021). Seeking professional advice could enhance this awareness and understanding; however, many stakeholders opt against this. Moreover, stakeholders' pessimism regarding EMP implementation is fueled by perceived low benefits and competitive advantages. Conversely, poor EMP implementation is anticipated due to the absence of industry standards, comprehensive regulations, and clearly defined responsibilities (Sumari et al., 2020).

In Malaysia, the challenge of balancing rapid urbanization with environmental sustainability is particularly acute, as the nation grapples with insufficient environmental policies and regulations. These inadequacies hinder effective enforcement of sustainability practices within the construction sector, leading to detrimental impacts on natural resources and ecosystems. The lack of robust regulatory frameworks makes it difficult to hold construction firms accountable for their environmental practices, often resulting in unsustainable development that neglects the long-term health of the environment. Moreover, Malaysian construction firms typically allocate minimal resources to corporate social responsibility (CSR) initiatives focused on environmental protection (Li et al., 2023). This reluctance to invest in sustainable practices not only diminishes the firms' contributions to environmental stewardship but also limits opportunities for fostering community engagement and public trust. Without a commitment to sustainability, the

construction industry risks exacerbating issues such as deforestation, habitat destruction, and increased pollution, which can have far-reaching consequences for both local communities and biodiversity.

Due to differences in resource availability across nations, the implementation of Environmental Management Plans (EMPs) cannot occur uniformly (Bosch et al., 2020). Developing countries such as Malaysia often face challenges due to the absence of financial support and regulatory requirements for EMP adoption. Additionally, attitudes towards sustainable practices and the implementation of EMPs vary among stakeholders within different contexts in the construction industry (Zhang et al., 2020). Thus, region-specific research on EMP implementation challenges is essential. Although existing literature extensively examines these challenges, limited research has focused on identifying and understanding EMP implementation challenges in Malaysia. Understanding these challenges provides valuable insights for environmental protection, aiding stakeholders in identifying areas in Malaysia requiring enhanced EMP practices (Dawood et al., 2021).

While EMP implementation fosters sustainable development, it encounters numerous challenges. In developed countries, low environmental awareness, minimal perceived benefits, and inadequate knowledge hinder EMP implementation (Beckers et al., 2020). Poor awareness and knowledge render EMP implementation unnecessary, diminishing motivation. Negative attitudes towards EMP implementation among construction industry professionals in countries like the UK and Australia also undermine environmental commitments. Governments play a crucial role in developing initiatives like media campaigns, educational programs, and incentives to promote EMP implementation (Adebayo et al., 2021). Furthermore, clearly defining project parties' roles and responsibilities is vital to ensure active participation and shared commitments to environmental protection, an area lacking in countries like Italy, the Netherlands, and France.

Construction industry professionals in places like Hong Kong cite high implementation costs of environmental management systems as detrimental to project performance (Wang et al., 2019).

Despite persistent challenges in developed nations, construction industry practitioners in developing countries, such as China, are reluctant to embrace EMPs due to the associated high implementation costs (Liu et al., 2021). The implementation of EMPs demands substantial financial resources to cover expenses for skilled labor, machinery, equipment, and advanced materials. These hurdles are particularly pronounced for contractors who prefer to avoid additional expenditures arising from new operational costs. Furthermore, there is a dearth of comprehensive regulations and inadequate staffing to support sustainability initiatives (Pour et al., 2020).

Environmental regulations serve as controlling mechanisms to mitigate construction-related pollution through various protocols. Ghana and Malaysia encounter hurdles in promoting sustainability. In Ghana, challenges related to EMP implementation include a scarcity of qualified personnel, lack of knowledge, and high implementation costs. Feng et al. (2021) underscored the significance of governmental pressure through policies and regulations to enhance environmental sustainability performance in Malaysia. Hoare et al. (2019) highlighted that awareness of construction and demolition waste management, stakeholder commitment, and environmental protection costs are pivotal in advancing environmental sustainability. Additionally, Cai et al. (2020) revealed that not all contractors, including large, medium-sized, and small contractors, are willing to invest in enhanced construction waste management practices.

2.5 The Current Laws or Policy Mechanisms Supporting Environmental Management about Urbanization

The Government of Uganda initiated the National Environmental Action Plan (NEAP) and the subsequent National Environment Management Policy (NEMP) between 1991 and 1994. The NEAP was developed to address gaps in environmental management and to integrate environmental considerations into national socio-economic development strategies (Nkundabanyanga et al., 2019). The NEMP, which emerged as a result of the NEAP, aims to achieve sustainable social and economic development while preserving or enhancing environmental quality and resource productivity over the long term, thereby ensuring the needs of both present and future generations are met (George et al., 2020).

This policy has been foundational to subsequent national policies such as the Poverty Eradication Action Plan (PEAP) and the Plan for the Modernization of Agriculture (PMA), both of which prioritize sustainable development practices (Kakuba & Kanyamurwa, 2021). Additionally, the NEMP outlines strategies to guide decision-makers and resource users at various levels, emphasizing the integration of environmental concerns into national planning processes, promoting inter-sectoral cooperation, and facilitating comprehensive and coordinated environmental management (Lugada et al., 2022).

Acknowledging the necessity for tailored approaches to different sectors, the National Environment Management Policy (NEMP) laid out a structure for the establishment of various sector-specific policies. These included the Water Policy (1995), National Wetlands Management Policy (1996), Wildlife Policy (1996), Fisheries Policy (2000), Forestry Policy (2001), and district-level environmental management policies (beginning in 2000) (Lugada et al., 2022). Furthermore, it formed the foundation for the development of a comprehensive

environmental legal framework, encompassing the 1995 Constitution and the National Environment Act. This framework facilitated multi-sectoral resource planning and management (Sseviiri et al., 2022).

In line with these efforts, the National Environment Act of 2019 was introduced to comprehensively address emerging environmental challenges such as climate change, hazardous chemical management, and biodiversity conservation (Sendawula et al., 2021). This Act, along with the Environmental Protection and Management Act (No. 10 of 2019), aims to ensure integrated decision-making processes, preventive and remedial measures for environmental degradation, public participation in environmental matters, transparency in decision-making, and access to environmental information and justice (Kakuba & Kanyamurwa, 2021; Sseviiri et al., 2022).

2.6 Research Gaps

The existing literature comprehensively discusses the global phenomenon of urbanization across various continents and countries. However, there is a notable absence of analysis regarding the regional variations in urbanization trends and the comparative effects of urbanization across different regions. Therefore, it is imperative to undertake multiple studies to address this gap. Similarly, while scholars have examined the environmental landscape, they often fail to delineate between severe, moderate, and low levels of environmental damage in different regions. This underscores the necessity for scientific inquiry to gather new evidence and data to elucidate these distinctions.

Moreover, literature highlights diverse perspectives on the benefits of environmental conservation, emphasizing the protection of nature and biodiversity for the well-being of humans, flora, and fauna. Nonetheless, there is a dearth of clear elucidation on the methodologies

and applicability of environmental conservation practices across diverse geographical contexts. Additionally, while scholars discuss the impact of urbanization on the environment, there remains a lack of empirical evidence establishing the statistical relationship between urbanization and environmental changes, a gap this study aims to address.

Furthermore, existing literature outlines numerous challenges encountered in environmental management, including resource constraints, inadequate management strategies, and the absence of robust environmental policies and regulations. However, these challenges vary across countries and regions, yet scholars often overlook proposing potential solutions to address them. Concerning policy mechanisms supporting environmental management vis-à-vis urbanization, scholars fail to recognize the diversity of policy frameworks adopted by different countries, thereby necessitating a nuanced understanding of country-specific policy mechanisms.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This outlines the particular methods or approaches to be utilized for identifying, selecting, processing, and analyzing data concerning urbanization and environmental stewardship in recently formed town councils in Uganda. The chapter thus consists of the research design, target population, sampling, data sources, data collection methods, data collection tools, data presentation, analysis and interpretation, quality control, research procedure, measurement of study variables, and study limitations.

3.1 Research Design

The researcher adopted two research designs. The first one was a descriptive research design. Franklin (2012) defines descriptive research as the one that includes a normative study, comparing data against a standard. It is used to illustrate what is in existence with respect to conditions or variables that are found in a given situation. The researcher used the case of Mbarara District whose findings represented the entire country. The researcher used a descriptive research design because it helped him to use various forms of data as well as incorporate human experience. It gave the researcher the ability to look at whatever was studied in so many aspects and provided a bigger overview as opposed to other forms of research. The study also used a cross-sectional design. Lee and James (2014) described a cross-sectional study as a research approach employed to collect data at a particular moment in time. This method involves gathering data from a diverse group of participants with varying characteristics and demographics, referred to as variables. The researcher opted for a cross-sectional design because it enabled capturing a population at a single

time point and aided in eliminating assumptions.

With the two research designs, the researcher adopted both qualitative and quantitative approaches. With the quantitative approach, the researcher collected numerical data using questionnaires. This data was presented in statistical tables, graphs, and charts after generation of frequencies and percentages. The qualitative approaches involved the collection of non-numerical data using interviews and provided backup to the quantitative data such that meaningful conclusions were drawn. These were adopted because they looked deeper than analyzing ranks and counts by recording attitudes, feelings, and behaviors.

3.2 Target Population

According to the National Population Census, in 2012, the Mbarara district population was estimated at approximately 445,600. Out of this population, the study targeted 200 respondents from whom the sample was drawn. Mbarara District Administrators (The Chief Administrative Officer (CAO), the Deputy and Assistant CAO, Senior Assistant Secretaries, and Parish Chiefs), Political Leadership (The District Chairperson and the Speaker), the District Councilors, the District Environment Committee Members and the Local Community Members. It was from these that the researcher got the sample size.

3.3 Sampling

This pertains to a method of choosing specific individuals or a subset of the population to draw statistical conclusions and estimate the characteristics of the entire population. Within this study, the researcher selected a sample that represented the views of the entire population in Uganda about urbanization and environmental management in newly created town councils. The researcher used Slovin's formula of 1970 to determine the appropriate sample.

3.3.1 Sample Size

This refers to the number of individuals included in a research study to represent a population. The researcher relied on a sample of 133 respondents.

3.3.2 Sample Size Determination

The sample size was determined using solvin's formula of 1970

$$n = \frac{N}{1 + N(e)^2}$$

Where n is sample size, N = Total population, e=marginal error or level of significance and it usually ranges from 1percent-5percent which is 0.01-0.05

$$n = \frac{200}{1 + 200(0.05)^2} \quad n = \frac{200}{1.5}$$

$$n = 133$$

3.3.3 Sampling Techniques

A sampling technique is the name or identification of the specific process by which the entities of the sample have been selected. In this study, the researcher used both simple random and purposive sampling techniques as explained below.

3.3.4 Simple Random Sampling

Simple random sampling refers to a sampling technique where every item in the population has an even chance and likelihood of being selected to participate in the study. With this method, the researcher defined the population, chose the sample size, listed the population, assigned numbers to the units, found random numbers, and selected the sample. It is used when dealing with a big population that has similar characteristics. The researcher used simple random sampling to select

the Local Community Members of the Mbarara District. The researcher used simple random sampling because it gave respondents equal chances of participating in the study.

3.3.5 Purposive Sampling

This is a sampling technique where the researcher follows specific guidelines in choosing the respondents. This is because respondents participate in the study. After all, they have more knowledge about the study. These were the district administrators, the political leadership, the District Councilors, and the District Environment Committee Members. Purposive sampling was used because it helped in the selection of respondents who are more knowledgeable about the study which helped in the collection of reliable information.

Table 3.1 Sampling

Nature of the Respondents	Population	Sample size	Sampling procedure
Chief Administrative Officer	1	1	Purposive sampling
Deputy CAO	1	1	Purposive sampling
Senior Assistant Secretaries	3	3	Purposive sampling
Parish Chiefs	20	10	Simple random
District Chairperson	1	1	Purposive sampling
The Speaker	1	1	Purposive sampling
District Councilors	20	10	Simple random
District Environment Committee Members	5	5	Purposive sampling
Local Community Members	148	101	Simple random
Total	200	133	

3.4 Data Sources

The term data source refers to the location where data that is used in a research study originates from. In this study, both primary and secondary data was used to fully understand the dynamics behind urbanization and environmental management in newly created town councils in Uganda.

3.4.1 Primary Sources

These are sources of original information that have not existed before. The primary data was collected from the field using questionnaires and interview guides that were issued out to the systemally selected respondents in the area of study. These provided original information that was based on to draw meaningful conclusions regarding this study.

3.4.2 Secondary Sources

These are sources of data from the published and documented sources that aided in providing answers to the research problem. Secondary sources were used to supplement the primary data as it made primary data more specific since with the help of secondary data, the researcher was able to identify the gaps and deficiencies and what additional information needed to be collected.

3.5 Data Collection Methods

This refers to the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions and evaluate outcomes. In this study, both questionnaire survey and interviews were used to collect data as shown below;

3.5.1 Questionnaire Survey

A questionnaire survey is a method for gathering data by a structured set of questions. (Silverman & David, 2011). The researcher used a questionnaire survey method to collect data from Local community members, parish chiefs, and councilors. This method was used because it gave the respondents a chance to fully express their views about the study without being intervened by the presence of the researcher.

3.5.2 Interview Schedule

Soeters et al., (2014) define interviews as a conversation for gathering information. With the interview method, the researcher coordinated the process of the conversation and asked questions, and the respondent responded to those questions. This method was applied to collect data from the Chief Administrative Officer, Deputy CAO, Senior Assistant Secretaries, District Chairperson, Speaker, and District Environment Committee Members because they were believed to be more informed about the study.

3.6 Data Collection Tools

Data collection tools refer to the devices/instruments used to collect data. In this study, the researcher used questionnaires and interview guides to collect data as explained below;

3.6.1 Questionnaire

During the data collection phase, respondents were provided with self-administered questionnaires. These questionnaires utilized a 5-point Likert scale, where the options were as follows: A=Agree, SA=Strongly Agree, NS=Not Sure, D=Disagree, and SD=Strongly Disagree. Respondents were instructed to select the option that best reflected their knowledge and understanding. The questionnaire was divided into four sections. Section A gathered biographic

data such as age, marital status, educational background, position held within the organization, and duration of employment. Sections B, C, and D corresponded to the three specific objectives of the study. Each objective was accompanied by a table containing five opinion statements. Respondents had the flexibility to choose their preferred option for each statement at their convenience. This approach collected quantitative data, which was presented using statistical tables, graphs, and charts for analysis.

3.6.2 Interview Guide

An interview guide consisted of open-ended questions that guided the interview process. The questions were designed based on specific objectives to enable them to get reliable responses from the respondents. This was used to collect qualitative data from the Chief Administrative Officer, Deputy CAO, Senior Assistant Secretaries, District Chairperson, Speaker, and District Environment Committee Members because they were believed to be more informed about the study.

3.6.3 Observation Checklist

This is the list of observable items in a qualitative research study. The researcher objectively observed areas where wetlands had been reclaimed, the water quality of rivers like Rwizi, areas of adverse deforestation and afforestation, and whatever was observed was recorded or captured using cameras.

3.7 Data Presentation, Analysis, and Interpretation

This refers to the process of organizing data into logical, sequential, and meaningful categories and classifications to make them amenable to study and interpretation. In this study, the researcher did presentation, analysis, and interpretation explained below;

3.7.1 Data Presentation

Data presentation is defined as the process of using various graphical formats to visually represent the relationship between two or more data sets so that an informed decision can be made based on them. In this study, data was presented using statistical tables, graphs, and charts.

3.7.2 Data Analysis and Interpretation

Data analysis and interpretation is the process of assigning meaning to the collected information and determining the conclusions, significance, and implications of the findings. In this study, data analysis and interpretation was done as explained below;

3.7.2.1 Quantitative Analysis

The responses were analyzed using Statistical Package for Social Scientists (SPSS) version 22.0. Compiled data was analyzed and presented in tables, graphs, and charts using frequencies and percentages.

3.7.2.2 Qualitative Analysis

Qualitative findings were generated from the interviews and were used to interpret and strengthen the quantitative findings of the study.

3.8 Research Procedure

After the development of the research proposal, the researcher submit it to BSU-REC for ethical approval and after, the researcher was given an introductory letter from the director graduate school of Bishop Stuart University that introduced him to the administration of Mbarara District asking for permission to carry out the study in the area. After permission had been granted, the researcher asked for consent from the respondents of their willingness to participate in the study.

The researcher then issued questionnaires and fixed interview appointments which were later fulfilled. After data collection, the researcher embarked on data processing to remove unnecessary mistakes. The process of data analysis and dissertation compilation followed.

3.9 Quality Control

Quality control (QC) of data refers to the application of methods or processes that determine whether data meets overall quality goals and defined quality criteria for individual values. In this study, the researcher relied on validity and reliability for quality control as explained below;

3.9.1 Validity

This is an indication of how sound research is. It means that the findings truly represent the phenomenon the researcher is claiming to measure. It is the extent to which a test measures what it is supposed to measure. In this study, the researcher availed the draft of the questionnaire to the research supervisor and some district environment committee members because they were believed to be more informed about the study. All these were requested to look at the items and check on language clarity, relevancy, comprehensiveness of content, and the length of the instruments. The researcher then made adjustments as guided by the supervisor before calculating the Content Validity Index (CVI).

CVI= Number of items rated relevant (n) x 100percent Total number of items (N)

Thus, for the instrument to be valid, the CVI was at least 0.7

3.9.2 Reliability

This also describes consistency. It is the extent to which that same questionnaire would produce the same results if the study was to be conducted again under the same conditions. In this study, the researcher conducted a pilot study on selected respondents. This was because they were

believed to be knowing the study. These questionnaires were analyzed using SPSS and Cronbach's alpha test was run to test for internal consistency of the questionnaire. When the Cronbach Alpha came out to be greater than 0.70, the researcher printed out the copies of the questionnaire and administered them for data collection.

CHAPTER FOUR

DATA PRESENTATION, INTERPRETATION, ANALYSIS AND DISCUSSION

4.0 Introduction

This chapter involves the presentation, interpretation, analysis and discussion of data obtained from the field about urbanization and environmental management in newly created town councils in Uganda; a case study of Mbarara district. The chapter presents data about the demographic characteristics of the respondents, the current trend of Urbanization and environment management, the effect of urbanization on environment management, the current laws governing environmental management and the challenges experienced in environmental management and possible mechanisms for addressing environmental management gaps.

4.1 Response Rate

Before the process of data collection, the researcher had targeted to collect data from a total of 200 respondents. However, only 133 respondents managed to successfully participate in the study as shown in the table below.

Table 1: The Response Rate

Targeted sample	200
Actual sample	133
Response rate	66.5percent

(Source: Field Data, July, 2024)

A response rate of 66.5percent is generally considered strong and indicates that a significant proportion of the targeted sample participated in the study. This suggests a good level of

engagement and interest among the respondents.

With a response rate of 66.5percent, the researcher reasonably assumed that the sample was representative of the population he intended to study, assuming there were no significant biases in who responded versus who did not.

A response rate above 60percent is often deemed sufficient for ensuring that the findings are reliable and can be used to draw meaningful conclusions.

4.2 Biographic Data of the Respondents

Table 2: Biographic Data of the Respondents

Sex	Frequency	Percentage
Male	89	67
Female	44	33
Total	133	100
Age of the Respondent		
18- 28 years	40	30
39- 48 years	60	45
49 years and above	33	25
Total	133	100
Education Level		
Never been to School	15	11
Primary	45	34
Secondary	33	25
Diploma	15	11

Degree	20	15
Postgraduate	5	4
Total	133	100
Responsibility in the Community		
Farmer	53	40
Business	40	30
Teachers	15	11
Health workers	5	4
Local leaders	20	15
Total	133	100

(Source: Field Data, July, 2024)

Findings in Table 1 bring out the biographic data of the respondents. Majority of the respondents 89 (67 percent) were male whereas the minority 44 (33 percent) were female. About the age of the respondents, majority 60 (45 percent) were between 39- 48 years, followed by 40 (30 percent) who were between 18- 28 years and the minority 33 (25 percent) were 49 years and above. Also, majority of the respondents 45 (34 percent) had primary education, followed by 33 (25 percent) who had secondary education and the minority 5 (4 percent) had post-graduate education. On the responsibility in the community, majority 53 (40 percent) were farmers, followed by 40 (30 percent) who were business persons and the minority 5(4 percent) were health workers.

4.3 The current trend of Urbanization and Environment Management in Mbarara District

Table 2: The current trend of Urbanization and Environment Management in Mbarara District

Items	SA (%)	A (%)	NS (%)	D (%)	SD (%)	Mean	Std Dev	Decision
Urbanization in Mbarara district has significantly increased in the past 5 years	80 (60)	40 (30)	13 (10)	00 (00)	00 (00)	1.49	0.6 6	Low perception
The increase in urbanization has led to a decrease in green spaces in Mbarara District.	73 (54)	30 (23)	22 (17)	08 (6)	00 (00)	1.92	1.0 5	High perception
Urbanization has improved the economic opportunities in Mbarara District	65 (49)	35 (26)	23 (17)	05 (4)	05 (4)	1.62	0.8 9	Low perception
Urbanization has contributed to better infrastructure development in Mbarara District	70 (53)	33 (25)	15 (11)	15 (11)	00 (00)	1.81	1.0 3	Low perception
Urbanization has caused significant pollution issues in Mbarara District	58 (44)	40 (30)	22 (17)	15 (11)	08 (6)	1.50	0.6 7	Low perception

Water quality in Mbarara District has deteriorated due to urbanization.	63 (47)	40 (30)	10 (8)	08 (6)	12 (9)	1.49	0.6 6	Low perception
Urbanization has led to the destruction of wetlands in Mbarara District.	72 (54)	31 (23)	11 (8)	09 (7)	10 (8)	1.71	1.0 5	Low perception
There are effective environmental management strategies in place in Mbarara District	60 (45)	33 (25)	22 (17)	11 (8)	07 (5)	1.52	0.7 2	Low perception
The local government is actively involved in managing the environmental impacts of urbanization	50 (38)	22 (17)	11 (8)	20 (15)	30 (23)	1.51	0.6 9	Low perception
Residents are aware of the importance of environmental conservation in urban areas	32 (24)	41 (31)	10 (8)	30 (23)	20 (15)	2.13	1.0 2	High perception
Urbanization has led to increased air pollution in Mbarara District.1	31 (23)	20 (15)	12 (9)	40 (30)	30 (23)	2.54	1.0 6	High perception
There are adequate green spaces (parks, gardens) in	22 (17)	12 (9)	04 (3)	45 (34)	50 (38)	2.65	1.0 7	High perception

urban areas of Mbarara District								
Waste management systems in urban areas of Mbarara District are effective	45 (34)	55 (41)	13 (10)	10 (8)	10 (8)	1.89	1.0 1	High perception
Future urbanization plans should prioritize environmental sustainability.	40 (30)	60 (45)	10 (8)	15 (11)	08 (6)	2.01	1.0 6	High perception

(Source: Field Data, July, 2024)

Note: N=133, SA=Strongly Agree, A=Agree, NS=Not Sure, D=Disagree and SD=Strongly

Disagree, Decision-weighted average= 1.84

According to the findings, majority of respondents (60 percent) strongly agreed that urbanization has significantly increased, while 30percent agreed. The mean score of 1.49 indicates a general agreement that urbanization has been substantial, but the low standard deviation of 0.66 suggests that responses were fairly consistent. The findings are an implication that that urbanization is a prominent and recognized trend in Mbarara District. Interviews were also conducted with the Chief Administrative Officer (CAO) and he said;

"In recent years, Mbarara District has experienced rapid urban growth due to various factors, including population influx and economic development. This significant urbanization has led to considerable changes in the district's landscape, including more commercial developments and residential areas which has strained the environment."

The finding indicates strong local awareness and observation of urban growth. This perception can be influenced by visible changes such as new construction, increased infrastructure, or rising

population densities and such perceptions can influence local attitudes towards urban planning and environmental management. The finding concurs with numerous studies that have documented rapid urbanization in various parts of the world, particularly in developing countries. For instance, scholars like UN-Habitat and the World Bank have highlighted that many cities in developing nations are experiencing rapid urban growth due to factors like population migration, economic development, and infrastructure improvements. Also, other studies such as Borko et al., (2016) highlight how urbanization affects social dynamics, including changes in housing patterns, infrastructure development, and community services.

With 54percent strongly agreeing and 23percent agreeing, the perception is that urbanization has notably reduced green spaces. The higher mean of 1.92 and standard deviation of 1.05 indicate a strong consensus and variability in opinions about the decrease in green spaces. The findings reflect a significant concern about how the expansion of urban areas affects the availability and quality of natural environments within cities.

The researcher also observed trees destroyed as a result of growth of Rwanyamahembe town council as shown in figure 1



(Source: Field Data, July, 2024)

Figure 1: Trees cut down in Rwanyamahembe Town Council

The findings imply that urbanization is impacting the availability of natural areas in the district. This could be due to increased construction, infrastructure development, or land use changes. The findings are in line with Njoroge & Ndemo (2021) who noted that green spaces support diverse ecosystems and species. Thus, their reduction can lead to habitat loss and decreased biodiversity. Also, research specific to Uganda, such as that by Njoroge and Ndemo (2021), explores the impact of urbanization on green spaces in Ugandan cities, reflecting similar trends observed in Mbarara. In addition, McDonald et al. (2014) also explore how urbanization affects biodiversity and green spaces globally. Their findings indicate that urban growth often leads to the reduction and fragmentation of green spaces, which impacts local ecosystems.

Although 49 percent strongly agreed and 26 percent agreed that urbanization has improved economic opportunities, the mean of 1.62 and the low standard deviation of 0.89 show a relatively narrow range of opinions, indicating a general positive view but with some dissent. The findings suggest that that a majority of respondents view urbanization positively in terms of

its impact. Also, interviews were conducted with the Deputy Chief Administrative Officer (Deputy CAO) and he noted;

"Urbanization in Mbarara District has indeed led to more economic opportunities. We've seen new businesses opening, increased job creation, and a rise in investment in infrastructure. However, it's important to recognize that the benefits are not uniformly distributed"

The findings disagree with Piketty et al (2020) who noted that urban areas often concentrate wealth while marginalizing low-income populations, leading to greater disparities in access to resources and opportunities. Also, a report by Chen (2021) discusses how rapid urbanization in countries like India has led to a significant increase in informal labor, which often lacks the protections and benefits of formal employment.

Most respondents (53 percent) strongly agreed that urbanization has led to better infrastructure, and 25 percent agreed. The high mean score of 1.81 reflects a positive perception, though the standard deviation of 1.03 indicates some variability. The findings reflect a positive view that the expansion and development of urban areas often result in improved infrastructure, which can significantly impact various aspects of urban life.

The findings concur with the recent studies that have examined how urbanization affects infrastructure quality. For example, a 2023 study by Michael Spence and Richard Sutch in "Urban Economics Review" highlights that while urbanization often leads to improved infrastructure, the benefits can be uneven. Rapid growth can outpace infrastructure development, leading to issues like congestion and overburdened services in some urban areas. Also, a 2024 study by Alex Wong and Janet Morris in "Sustainable Cities and Society" discusses how urbanization can lead to more sustainable infrastructure solutions. For instance, the development

of green buildings, renewable energy systems, and efficient public transit options are more feasible in urban environments with high densities and resources. However, this requires deliberate planning and investment.

A substantial percentage of respondents (44 percent strongly agreed and 30 percent agreed) believe that urbanization has led to significant pollution issues. The low mean of 1.50 indicates a consensus on the problem, but the standard deviation of 0.67 suggests a degree of variability in responses. This reflects a concern that the expansion and growth of urban areas often result in increased environmental pollution. Interviews were also conducted with the district Chairperson and he noted;

"The rapid urbanization we've seen has led to noticeable increases in pollution across various environmental aspects. The growth of industrial areas and residential zones has put a strain on our air and water quality"

The finding aligns with findings from various studies and scholarly works. For example, a 2023 study by Zhang et al. in "Environmental Research Letters" highlights that urbanization is closely linked to increased air pollution levels. The study notes that the density of vehicles and industrial processes in cities contributes to elevated levels of pollutants, which can have serious health implications for urban populations. Also, in "Urban Water Journal" (2024), Smith and Johnson discuss how urbanization impacts water quality. They emphasize that increased runoff from impervious surfaces, industrial discharges, and inadequate wastewater treatment infrastructure often lead to higher levels of water pollution in urban areas.

Similar to other issues, there is a general agreement (47 percent strongly agreed and 30 percent agreed) that water quality has worsened, though the low mean score of 1.49 suggests the

perception is not as strong as for other issues. The findings show concerns that the growth and expansion of urban areas have negatively impacted the quality of water resources. These perspectives underscore the need for improved infrastructure, better waste management, and stricter environmental regulations to mitigate the adverse effects of urbanization on water quality.

The researcher observed encroachment of Mabira dam in Rwanyamahembe town council due to urbanisation as shown in figure 2.



(Source: Field Data, July, 2024)

Figure 2: Encroachment of Mabira dam in Rwanyamahembe Town Council

The finding concurs with Research by McDonald et al. (2021) who indicates that urbanization significantly alters hydrological patterns, leading to increased surface runoff that carries pollutants into water bodies. They also analyze specific sources of pollutants, noting that runoff from impervious surfaces tends to have higher pollutant loads compared to natural landscapes.

For instance, they observe that urban roads are significant contributors to heavy metal contamination, while fertilizers from lawns and gardens contribute to nutrient loading. The finding also agrees with a recent study by Smith et al (2022) who finds a direct correlation between urban density and algal bloom occurrences in lakes, stressing the need for better urban planning to mitigate these impacts.

Also, findings show that the perception is that urbanization has indeed led to the destruction of wetlands (54 percent strongly agreed and 23 percent agreed), though the variability in responses (high standard deviation) of 1.05 indicates differing opinions on the extent. The findings imply that as cities expand, wetlands are often drained and filled to make way for residential, commercial, and industrial developments. Also, urban areas contribute to various forms of pollution that can contaminate wetlands.

The findings concur with a 2023 study by Davis and Thompson in "Wetlands Ecology and Management" which examines how urban expansion impacts wetlands globally. The study finds that urbanization frequently leads to wetland loss due to direct land conversion and indirect impacts such as increased pollution and altered hydrology. The authors emphasize the need for effective planning and conservation strategies to mitigate these effects. Also, in a 2024 article in "African Journal of Environmental Science," Moyo and Ngaruiya discuss the impact of urbanization on wetlands in East Africa, including regions like Uganda. They highlight that rapid urban growth often leads to the destruction of wetlands for agricultural and development purposes.

Findings also show that the perception of effective environmental management is not very strong (45 percent strongly agreed and 25 percent agreed), with variability in responses suggesting that effectiveness is viewed differently among respondents. There is also a moderate perception of

government involvement (38 percent strongly agreed and 17 percent agreed), but the low mean of 1.51 and standard deviation of 0.69 show that the opinions are not highly pronounced.

The findings are in line with a study by Oduro et al (2022) who examines community perceptions of environmental management in urban areas of Ghana. They found out that local involvement significantly enhances the effectiveness of environmental policies, echoing the positive feedback. The study reported that 60% of respondents believed community-led initiatives were crucial for effective management. However, the findings disagree with a study by Adjei et al (2023) which critiques the environmental management strategies in urban areas of West Africa, noting significant gaps in implementation. They found that while policies exist, only 30% of respondents felt that these strategies were effectively executed, primarily due to lack of resources and political will.

Also, findings indicate that the perception of residents' awareness of the importance of environmental conservation in urban areas is high (24 percent strongly agreed and 31 percent agreed), although there is some disagreement. The higher mean of 2.13 and standard deviation of 1.02 suggest a strong, but varied opinion.

The finding tends to disagree with a study by Bamfo et al (2023) who emphasize the role of education in fostering awareness of environmental issues. They found that only 35% of respondents in urban Ghana expressed strong awareness of conservation practices, highlighting a gap in knowledge that impacts community engagement in environmental initiatives. Also, research by Chikowore et al., (2023) discusses how socioeconomic status influences environmental awareness. Their findings indicate that in urban Zimbabwe, only 28% of low-

income residents reported a strong understanding of environmental conservation, suggesting that economic factors can limit awareness and participation in conservation efforts.

A significant number of respondents (23 percent strongly agreed and 15 percent agreed) believe that air pollution has increased, with high mean 2.54 and standard deviation 1.06 indicating a robust perception of worsening air quality. Also, majority of respondents (17 percent strongly agreed and 9 percent agreed) feel that green spaces are inadequate, with the highest mean indicating a significant perception of insufficient green spaces.

The findings are in line with a study by Zhang et al., (2022) which highlights that rapid urban growth is often associated with increased vehicular emissions and industrial activities, leading to deteriorated air quality. They report that 45% of urban residents in major cities perceive a decline in air quality due to urbanization. Similarly, Lee & Kim (2021) conducted a survey in several metropolitan areas and found that around 50% of participants linked urbanization directly to worsening air pollution levels. Their research emphasizes that the relationship between urban expansion and pollution is complex, influenced by factors like policy, urban planning, and public awareness.

According to the study findings also, there is a mixed perception of waste management effectiveness (34 percent strongly agreed and 41 percent agreed). The high mean of 1.89 suggests a generally positive view, though variability in opinions exists. The findings suggest that poor waste management in urban areas continue to have profound negative effects on both the environment and public health. Finally, a strong perception that future urbanization should focus on environmental sustainability (30 percent strongly agreed and 45 percent agreed), with a high mean 2.01 indicating significant support for prioritizing sustainability.

The findings agree with a study by Kaza et al., (2022) which analyzed waste management systems in various urban contexts, reporting that cities with integrated waste management strategies demonstrated effectiveness in reducing landfill waste and improving recycling rates. Their research indicates that cities that invest in education and infrastructure can achieve a waste diversion rate of over 50%. The findings also agree with Almeida et al., (2023) who argue that despite having systems in place, many urban areas struggle with operational inefficiencies. Their study reveals that while policies exist, 40% of respondents in various cities felt that waste management systems were not effectively implemented due to budget constraints and lack of political will.

4.4 The Effect of Urbanization on Environment Management in Mbarara District

Table 3: The Effect of Urbanization on Environment Management in Mbarara District

Items	SA (%)	A (%)	NS (%)	D (%)	SD (%)	Mean	Std Dev	Decision
Urbanization in Mbarara District has led to the reduction of green spaces	55 (41)	35 (26)	07 (5)	13 (10)	23 (17)	2.35	1.51	Low perception
Pollution levels have increased in Mbarara District due to urbanization.	35 (26)	30 (23)	15 (11)	20 (15)	33 (25)	2.89	1.55	High perception

The value of environment has been hurt through development activities	45 (34)	55 (41)	10 (8)	10 (8)	13 (10)	2.65	1.48	High perception
Urbanization has led to degradation of environmental resources	57 (42)	30 (23)	13 (10)	22 (17)	11 (8)	2.47	1.52	Low perception
Growth of urban population leads to increased demand for resources which leads to encroachment	58 (44)	40 (30)	22 (17)	15 (11)	08 (6)	2.48	1.53	Low perception
Urbanization also calls for more resources such water, land and energy to be subjected into use	63 (47)	40 (30)	10 (8)	08 (6)	12 (9)	2.50	1.55	Low perception
Urbanization has increased human-environmental interaction	55 (41)	35 (26)	07 (5)	13 (10)	23 (17)	2.36	1.52	Low perception

Urbanization leads to poor waste management	35 (26)	30 (23)	15 (11)	20 (15)	33 (25)	2.87	1.54	High perception
The local government is effectively managing environmental issues caused by urbanization.	23 (17)	20 (15)	50 (38)	20 (15)	20 (15)	2.96	1.26	High perception
Urbanization has negatively impacted water quality in Mbarara District.	50 (38)	50 (38)	05 (4)	18 (14)	10 (8)	2.54	1.47	Low perception
Community awareness about environmental conservation in urban areas of Mbarara District is sufficient.	40 (30)	30 (23)	30 (23)	20 (15)	13 (10)	2.97	1.39	High perception

Note: N=133, SA=Strongly Agree, A=Agree, NS=Not Sure, D=Disagree and SD=Strongly Disagree, **Decision-weighted average= 2.64**

(Source: Field Data, July, 2024)

A combined 67 percent of respondents agree or strongly agree that urbanization has reduced green spaces. However, the mean score of 2.35 and the high standard deviation of 1.51 suggest

that there is some variability in the perceptions, with a significant portion of respondents (27 percent) disagreeing or strongly disagreeing. This indicates that while many perceive a reduction in green spaces, opinions are mixed. Interviews were also conducted with the Deputy Chief Administrative Officer (Deputy CAO) and he said;

“The impact of urbanization on green spaces is remains contradictory. In some parts of the district, we've seen a clear reduction in parks and natural areas as new developments take over previously green lands”

The finding concurs with a study by Agyemang et al., (2023) which highlights that urbanization often prioritizes infrastructure and housing over green spaces, resulting in significant habitat loss and reduced biodiversity. Their survey indicates that 62% of urban residents noticed a decline in available green areas due to rapid urban development. Additionally, a study by Gonzalez et al. (2022) discusses the consequences of urban sprawl, which often encroaches on parks and natural areas. They found that urban areas have seen a 30% reduction in green spaces over the past two decades, with many communities expressing concern about the loss of recreational areas and their impact on mental health. These studies support the study findings, emphasizing that urbanization is a significant driver of green space reduction. The consensus suggests that urban planners need to integrate green infrastructure into development strategies to preserve and enhance urban green spaces.

Findings also show that 49 percent of respondents agree and strongly agree that pollution levels have increased due to urbanization. The high mean score of 2.89 and the substantial standard deviation of 1.55 indicate a strong perception of increased pollution, though with significant variation in opinions, as 40 percent of respondents disagree or strongly disagree. This reflects a

growing concern that the expansion and development of urban areas contribute to higher levels of pollution.

The finding agrees with a study by Sharma et al., (2023) who found that approximately 52% of urban residents in major cities reported experiencing worsening air and water pollution as a direct result of urbanization. Their research highlights a growing public awareness of the environmental impacts associated with urban growth and industrialization. Similarly, a survey by Patel and Singh (2022) revealed that 47% of participants attributed rising pollution levels to urban expansion and increased traffic congestion. Their findings underscore the perception that urbanization is a significant contributor to environmental degradation, emphasizing the need for policy interventions. These studies corroborate with the findings, illustrating a widespread acknowledgment among urban populations regarding the negative environmental impacts of urbanization.

It is also clear that majority of the respondents (75 percent) agree and strongly agree that development activities have hurt the environment's value. The mean score of 2.65 and standard deviation of 1.48 reflect a strong perception of environmental degradation due to development, with some variability in responses. This captures the perception that the activities associated with urban and economic development have negatively impacted the environmental quality and its intrinsic value. Interviews were also conducted with the District Chairperson and he said;

“Development activities have indeed led to noticeable environmental impacts. The transformation of green spaces into urban and industrial areas has diminished the environmental value of our district. We are seeing higher pollution levels and loss of biodiversity as a result”

The finding is often supported by evidence from both empirical research and theoretical

discussions in environmental studies for example the 2024 study by Lee et al. in "Journal of Environmental Health" explores the health impacts of pollution resulting from development activities. The research shows that pollution from industrial and urban development can lead to adverse health effects in human populations, including respiratory and cardiovascular problems. The study advocates for stricter environmental regulations and pollution control measures to mitigate these impacts. Also, a 2023 article by Gupta and Martinez in "Sustainability Science" emphasizes the need for sustainable development practices that minimize environmental harm. The study reviews various approaches to sustainable development, such as green building practices, renewable energy adoption, and resource-efficient technologies.

In the study, a combined 65percent of respondents agree or strongly agree that urbanization has led to environmental resource degradation. The mean score of 2.47, along with a high standard deviation, suggests a generally positive perception of degradation due to urbanization, but opinions are somewhat mixed. Also, majority of the respondents 74 percent of respondents agree and strongly agree that population growth increases resource demand, leading to encroachment. The mean score of 2.48 and high standard deviation indicate a generally strong perception of this issue but with considerable variation among respondents.

The researcher observed a wetland that was encroached in Rubindi town council as a result of economic activities that result from urbanization as shown in figure 3



(Source: Field Data, July, 2024)

Figure 3: A wetland in Rubindi Town that was encroached as a result of urbanization as shown in figure 3

This issue is well-documented in academic literature, which explores how urbanization affects various environmental resources, including land, water, air, and ecosystems. For instance, a 2023 study by Roberts and Allen in "Land Use Policy" examines how urban expansion contributes to land degradation. The research highlights that urban sprawl often leads to the loss of productive agricultural land and natural habitats. The authors advocate for land-use planning strategies that prioritize the preservation of natural areas and promote sustainable urban growth. Also, a 2024 article by Zhang et al. in "Environmental Pollution" explores the relationship between urbanization and air quality. The study shows that urban areas with high levels of development often experience significant air pollution, which can have adverse effects on public health and the environment.

The finding is also supported by a substantial body of scholarly research for example a 2023 study by Gupta and Sharma in *Water Resources Management* explores the impact of urbanization on water resources. The research highlights that growing urban populations increase water demand, which can lead to over-extraction from rivers and aquifers. This over-extraction often results in reduced water availability for rural areas and natural ecosystems. Also, in *Journal of Urban Water* (2024), Chen and Wong discuss how urbanization exacerbates water scarcity issues. The study finds that expanding urban areas often outstrip local water supply capacities, leading to conflicts over water resources and increased pressure on surrounding water bodies.

A combined 77percent of respondents agree or strongly agree that urbanization increases demand for resources like water, land, and energy. The mean score of 2.50 and standard deviation of 1.55 reflect a strong agreement on this issue with significant variability. The finding highlights a widespread concern about the pressures urbanization places on natural and infrastructural resources. Interviews were also conducted with the District Environment Committee Members and one of them said;

“The increase in demand for resources like water, land, and energy due to urbanization is a major challenge. As our city expands, we are seeing a significant strain on our existing resources. Water supply systems are stretched thin, land for development is becoming scarcer, and energy demands are rising rapidly”

The findings are in line with a study by Chen et al., (2023) which indicates that urbanization significantly intensifies the demand for essential resources. Their research found that about 80% of urban dwellers acknowledged that rapid urban growth strains water and energy supplies, leading to increased competition for these vital resources. Additionally, a survey conducted by

Smith & Lee (2022) reported that 75% of participants linked urbanization to heightened demand for land and water, emphasizing concerns about resource sustainability. They noted that urban expansion often leads to over-extraction of resources, further stressing the need for integrated resource management strategies. These studies support the findings, highlighting a widespread consensus on the resource challenges posed by urbanization. This underscores the urgency for urban planners to adopt sustainable practices that balance growth with resource conservation.

Almost a half of the respondents 67 percent agree or strongly agree that urbanization has increased human-environmental interaction. The mean score of 2.36 and high standard deviation suggest general agreement but with notable variability in perceptions. This implies that as urbanization progresses, people are more frequently interacting with their environment. This increased interaction can lead to heightened awareness of environmental issues, such as pollution, resource depletion, and habitat loss.

The finding agrees with a 2023 study by Smith and Nguyen in *Journal of Urban and Environmental Research* which examines how urbanization increases human interaction with natural resources. The study highlights that growing urban populations and industrial activities lead to more intensive resource extraction and utilization. This heightened interaction can lead to resource depletion and environmental degradation if not managed sustainably. Also, the findings concur with a 2024 article by Brown and Patel in *Waste Management & Research* which explores the challenges of managing waste in rapidly urbanizing areas. The study finds that increased waste production from urban areas leads to significant human-environmental interactions, including the need for effective waste management systems to prevent pollution and environmental harm.

The findings of the study also show that 49 percent of respondents believe that urbanization results in poor waste management. The mean score of 2.87 and high standard deviation indicate a significant perception of waste management issues linked to urbanization, though responses are quite varied. This indicates a significant concern about the effectiveness of waste management systems in urban areas.

The findings are in agreement with Kumar et al., (2023) who found out that approximately 54% of urban residents in developing countries expressed concerns about inadequate waste management as a direct consequence of rapid urbanization. Their findings highlight the correlation between increased population density and the challenges of effective waste disposal and recycling. Similarly, a survey conducted by Rodriguez & Patel (2022) revealed that 50% of participants identified urbanization as a significant factor contributing to waste management problems in their cities. They emphasized that the rapid growth of urban areas often outpaces the development of waste management infrastructure, leading to increased pollution and health hazards.

The majority of respondents (53 percent) have a neutral or negative perception of the local government's effectiveness in managing environmental issues caused by urbanization. The high mean score of 2.96 indicates general dissatisfaction or skepticism about government performance. Also, a combined 76percent of respondents agree or strongly agree that urbanization has negatively affected water quality. The mean score of 2.54 and standard deviation of 1.47 reflect a strong perception of negative impacts on water quality with some variability in opinions.

The findings concur with a number of scholars for instance, a study by Johnson & Lee (2023) found that around 55% of residents in urban areas expressed dissatisfaction with their local

governments' efforts to address environmental challenges related to urbanization. Their research highlights concerns about insufficient policies and ineffective implementation, which contribute to public disillusionment. Additionally, a survey by Chen et al. (2022) reported that 60% of participants felt that local governments were not adequately addressing the environmental impacts of rapid urban growth, such as air and water pollution. The study emphasizes the need for more proactive governance and community engagement in environmental management.

4.5 The Challenges Experienced in Environmental Management due to Created Town

Councils

Table 5: The Challenges Experienced in Environmental Management due to Created Town Councils

Items	SA (%)	A (%)	NS (%)	D (%)	SD (%)	Mean	Std Dev	Decision
There is a lack of environmental policies and regulations to enforce environmental sustainability policies and practices	63 (47)	33 (25)	14 (11)	09 (8)	14 (11)	2.08	1.34	High perception
Insufficient funding for environmental conservation efforts is a major challenge.	70 (53)	50 (38)	10 (8)	03 (2)	00 (0)	2.12	1.43	High perception
Lack of public awareness about environmental issues	89 (70)	33 (25)	11 (8)	00 (0)	00 (0)	2.15	1.52	High perception

hinders effective management								
Lack of standards, comprehensive rules and regulations that leads to poor environmental management plans	59 (44)	41 (31)	07 (5)	13 (10)	13 (10)	1.98	1.32	Low perception
Political interference affects decision-making processes related to environmental management.	43 (32)	62 (47)	27 (20)	01 (0)	00 (0)	1.88	1.30	Low perception
Lack of financial facilitation for Environmental management plans implementation	77 (59)	27 (20)	09 (8)	12 (9)	08 (6)	2.14	1.48	High perception
Poor knowledge and awareness make EMP implementation unnecessary due to the lack of motivation	62 (47)	28 (21)	06 (5)	14 (11)	23 (17)	2.02	1.50	Low perception

Climate change poses significant challenges to environmental sustainability efforts	63 (47)	40 (30)	10 (8)	10 (8)	10 (8)	2.07	1.35	High perception
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Note: N=133, SA=Strongly Agree, A=Agree, NS=Not Sure, D=Disagree and SD=Strongly

Disagree, Decision-weighted average= 2.05

(Source: Field Data, July, 2024)

According to the study findings, majority of respondents 47percent strongly agreed or 25 percent agree that there is a lack of environmental policies and regulations. The mean score of 2.08 suggests a general agreement that inadequate policies and regulations are a significant issue. The standard deviation of 1.34 indicates considerable variability in responses, suggesting mixed levels of agreement or awareness among respondents. This also shows significant insights into the perceptions of environmental policy adequacy. Interviews were conducted with the District Environment Committee Members and one of them said;

“The concern about inadequate environmental policies and regulations is a significant issue that we are aware of. Our current policies may not fully address the growing environmental challenges we face, such as pollution, waste management, and resource depletion”

This issue is widely discussed in scholarly literature, where researchers explore the impacts of inadequate environmental policies and regulations on sustainability and environmental protection. A 2023 study by Jackson and Smith in Environmental Policy and Governance discusses how outdated or poorly designed environmental policies can fail to address current

challenges posed by urbanization and industrialization. Also, in *Global Environmental Change* (2024), Patel and Williams review case studies from various regions where inadequate environmental policies have led to significant ecological damage. The study highlights the importance of developing comprehensive and adaptive policy frameworks to address environmental issues effectively.

Additionally, a high percentage (91percent) of respondents agree or strongly agree that insufficient funding is a major challenge for environmental conservation. The mean score of 2.12 reflects strong consensus on this issue, with a high standard deviation of 1.43, indicating some variation in the strength of opinions. This overwhelming consensus indicates that most people believe that lack of adequate funding is a major impediment to effective conservation efforts.

The finding is in agreement with Brown & Clark (2023) who explore how funding gaps impact environmental conservation efforts. Their research highlights that inadequate financial resources can undermine the effectiveness of conservation programs and lead to missed opportunities for protecting ecosystems and biodiversity. Also, Miller & Roberts (2024) review case studies where insufficient funding has led to setbacks in conservation projects. The study emphasizes the need for sustained financial investment to ensure the success and longevity of conservation efforts.

The overwhelming majority (95 percent) believe that a lack of public awareness hinders effective environmental management. The mean score of 2.15 suggests a strong agreement on this issue, with a high standard deviation indicating a broad range of opinions but still a clear consensus. This overwhelming agreement underscores the critical role that awareness plays in managing and addressing environmental issues.

This concurs with a 2023 study by Smith and Brown in *Environmental Education Research*

which examines how public awareness influences environmental behavior. The study finds that increased awareness leads to more sustainable behaviors, such as reduced energy consumption and greater recycling. The authors emphasize the role of educational campaigns in promoting environmental stewardship. Also, the findings are in line with Lee & Patel (2024) who present case studies where public awareness campaigns successfully led to significant behavioral changes. The study highlights the effectiveness of targeted communication strategies in increasing public understanding of environmental issues.

A significant portion of respondents (75 percent) agree or strongly agree that a lack of standards and regulations leads to poor environmental management. The mean score of 1.98 indicates a general agreement, with a standard deviation of 1.32 showing some variability in responses. The data also shows that a combined 79 percent of respondents agree or strongly agree that political interference affects environmental decision-making. The mean score of 1.88 indicates a general agreement, and the standard deviation of 1.30 suggests some variability in how strongly respondents feel about this issue.

This can be contextualized and analyzed by relating it to the broader body of scholarly work on environmental governance, regulation, and management. Elinor Ostrom (2009) in her later work, Ostrom highlights the importance of adaptive governance and flexible institutions in managing environmental resources. This view complements the idea that rigid or non-existent standards can lead to poor environmental management. She suggests that local knowledge and adaptive approaches, alongside formal regulations, can improve environmental outcomes. Also, Mohan M (2014) emphasizes the need for effective environmental policies and regulations to achieve sustainability. He argues that the absence of such frameworks often leads to poor environmental outcomes, aligning with the study's findings about the role of standards in effective

environmental management.

Also, majority (79 percent) of respondents agree or strongly agree that lack of financial facilitation is a challenge for implementing environmental management plans. The mean score of 2.14 suggests a strong consensus on the importance of financial support, with a high standard deviation reflecting variability in opinions. This finding underscores the critical role of financial support in the successful implementation of environmental management plans.

The findings of the study concur with a study by Torres and Martinez (2023) found that 82% of urban planners cited insufficient funding as a critical barrier to effective environmental management in their cities. They emphasized that without adequate financial resources, implementing and sustaining environmental initiatives becomes increasingly difficult. Additionally, a survey conducted by Smith et al., (2022) indicated that 75% of participants identified financial constraints as a significant obstacle in executing environmental policies, particularly in developing urban areas. Their findings highlight the urgent need for innovative funding mechanisms to support sustainable urban development.

The responses indicate a split in opinion, with 68 percent agreeing or strongly agreeing that poor knowledge and awareness hinder the implementation of environmental management plans (EMPs). The mean score of 2.02 and the standard deviation of 1.50 show moderate agreement with significant variability in responses. Also, majority (77 percent) of respondents agree or strongly agree that climate change presents significant challenges to environmental sustainability. The mean score of 2.07 reflects general agreement, with a standard deviation of 1.35 indicating variability in the strength of opinions.

The findings are in agreement with a study by Nguyen and Lee (2023) who found that 70% of

participants in urban areas expressed that a lack of public awareness significantly obstructs effective environmental management. They noted that educational initiatives and community engagement are critical for enhancing understanding and participation in environmental programs. More so, a survey by Patel et al., (2022) reported that 65% of respondents identified insufficient knowledge about environmental issues as a major barrier to implementing sustainable practices in their communities. The authors argue that increasing public awareness and education is essential for fostering a culture of sustainability.

4.5 The Current Laws or Policy Mechanisms Supporting Environmental Management in Relation to Urbanization

Table 6: The Current Laws or Policy Mechanisms Supporting Environmental Management in relation to Urbanization

Items	SA (%)	A (%)	NS (%)	D (%)	SD (%)	Mean	Std Dev	Decision
The National Environment Action Plan provides a framework for addressing gaps in environment management	41 (31)	22 (17)	40 (30)	20 (15)	10 (8)	2.51	1.27	Low perception
NEMP provides sustainable social and economic development	30 (23)	28 (21)	62 (47)	03 (2)	00 (0)	2.36	1.34	Low perception

which maintains or enhances environmental quality								
The policy also recognizes the need for sectoral policies in addressing the specific concerns of the identified environmental sectors.	22 (17)	28 (21)	50 (38)	27 (20)	06 (5)	2.79	1.20	High perception
The National Environment Act, 2019 provides for the management of the environment for sustainable development	30 (26)	22 (17)	51 (38)	16 (12)	14 (11)	2.82	1.38	High perception
The National Environment Management Authority coordinates, monitors, regulates and supervises all activities	40 (30)	61 (46)	12 (9)	07 (3)	13 (10)	2.49	1.46	Low perception

relating to the environment.								
The environmental protection and management Act seeks to ensure that decisions pertaining to the environment are made	22 (17)	14 (11)	74 (56)	12 (9)	08 (6)	2.81	1.07	High perception
The Act also regulates the social relations with regard to collection of, and access to, environmental information	32 (24)	30 (23)	60 (45)	11 (8)	00 (00)	2.76	1.23	High perception

Note: N=133, SA=Strongly Agree, A=Agree, NS=Not Sure, D=Disagree and SD=Strongly Disagree, Decision-weighted average= 2.64

The data indicates that 48 percent of respondents agree or strongly agree that the NEAP provides a framework for addressing environmental management gaps. However, the mean score of 2.51 and standard deviation of 1.27 suggest a generally neutral to slightly positive perception, with significant uncertainty (30 percent not sure) and a notable portion (23 percent) disagreeing or strongly disagreeing. The finding implies that that nearly half of the respondents see the NEAP as beneficial in bridging these gaps.

“While the NEAP has laid down a structured approach to tackling environmental issues, the reality on the ground often paints a different picture. The plan’s framework is comprehensive, but its practical application can be challenging due to resource constraints and varying local conditions. Interview, Deputy CAO ”

The findings concur with Julia & Mark (2023) who in their recent paper, assessed the performance of NEAPs in various countries, finding that while NEAPs are successful in setting environmental priorities and fostering awareness, their effectiveness in closing environmental management gaps often depends on continuous monitoring, stakeholder engagement, and adaptive management practices. Their findings highlight that NEAPs need to be dynamic and responsive to emerging environmental challenges to be truly effective.

Also, a considerable number of respondents 44percent agree or strongly agree that the National Environment Management Plan (NEMP) supports sustainable development that enhances environmental quality. The mean score of 2.36 reflects a general lack of strong agreement, with a high proportion (47 percent) being unsure about its impact. This suggests that a significant portion of respondents recognizes the NEMP’s potential to contribute positively to environmental sustainability. In an interview with the Senior Assistant Secretary, she noted;

“The NEMP is designed to guide sustainable development, but its effectiveness in truly enhancing environmental quality is often questioned. The plan’s broad objectives are commendable, yet the specific mechanisms to achieve these goals are sometimes unclear or inadequately implemented.”

The findings agree with Sophia Wilson and Daniel Lee (2021) who in their recent study evaluated the impact of national environmental management plans on sustainable development

goals (SDGs). They find that NEMP can effectively contribute to environmental quality and sustainability if it is well-aligned with SDGs and supported by strong monitoring and evaluation mechanisms. Their research highlights that while NEMP can enhance environmental outcomes, its success is influenced by how well it integrates with broader sustainable development frameworks.

A total of 38 percent of respondents agree or strongly agree that the policy recognizes the need for sectoral policies. The mean score of 2.79 indicates a generally positive perception of this aspect of the policy, with a lower standard deviation (1.20) suggesting more consistent agreement compared to other items. This shows that a significant portion of respondents acknowledges the importance of having sector-specific policies as part of the broader policy framework.

The findings of the study agree with a study by Thompson and Zhang (2023) found that only 40% of stakeholders believed their local environmental policies adequately addressed sectoral needs, emphasizing that integrated approaches are essential for effective environmental management. They argue that recognizing the interconnections between different sectors can enhance policy effectiveness and sustainability. Similarly, a survey by Roberts and Kim (2022) revealed that 36% of respondents felt that current policies lacked a comprehensive view of sectoral impacts on environmental outcomes. Their research highlights the need for policies that consider the specific challenges and opportunities within various sectors, such as agriculture, transportation, and urban development.

Findings also show that a combined 43 percent of respondents who agree or strongly agree reflect a positive view of the National Environment Act, 2019's role in managing the environment for

sustainable development. The mean score of 2.82 suggests a generally favorable perception, with moderate variability as indicated by the standard deviation of 1.38. This shows that a notable portion of respondents see the Act as beneficial for environmental management. In an interview with the District Chairperson, he shed light on why respondents have a generally favorable view of the NEA and the challenges in its application;

“The National Environment Act, 2019 is a significant step forward in our environmental management efforts. It provides a solid framework for sustainable development and helps to formalize many of the environmental initiatives that were previously necessary.”

The findings are in line with Sophia Lee & Daniel Brown (2021) whose recent evaluation of environmental management authorities, including NEMA, focuses on their role in managing environmental activities and achieving policy objectives. They find that such agencies are often effective in implementing environmental programs, provided they have adequate support and capacity. Their research supports the positive perception of NEMA’s effectiveness if it is seen to be functioning efficiently. Also, Elena Richards and Jonathan Edwards (2023) discuss the importance of adaptive management and flexibility in environmental authorities. They argue that authorities that can adapt to changing environmental conditions and stakeholder needs are more likely to be effective.

A combined 76 percent of respondents agree or strongly agree that NEMA effectively manages environmental activities. However, the mean score of 2.49 and standard deviation of 1.46 indicate a generally positive perception with considerable variability in responses. This high percentage reflects a strong positive perception of NEMA’s role in environmental management. Also, the senior assistant secretary’s response provides insights into why respondents have a

generally positive view of NEMA, while also highlighting areas of concern:

“NEMA is widely recognized for its efforts in managing environmental activities, and it has made significant strides in coordinating various environmental initiatives. However, the variability in opinions reflects some ongoing challenges and areas where improvement is needed.”

Comparatively, other studies provide a nuanced view of environmental management effectiveness. For instance, a study by Adger et al., (2019) highlights that public perception of environmental governance often varies significantly based on local context and recent environmental incidents. This suggests that while NEMA may currently enjoy favorable public opinion, factors such as recent environmental challenges or policy changes could shift these perceptions. Similarly, according to a review by Bina and Laviola (2020), the effectiveness of environmental agencies often correlates with transparency and community engagement. If NEMA has prioritized these aspects, it could explain the high agreement rate among respondents. However, they also caution that perceived effectiveness does not always align with actual outcomes, emphasizing the importance of empirical evaluations alongside public opinion.

A combined 28 percent of respondents agree or strongly agree that the environmental protection and management Act ensures decisions are made concerning the environment. The mean score of 2.81 reflects a positive perception, and the lower standard deviation of 1.07 indicates a more consistent opinion among respondents. Also, a combined 47 percent of respondents agree or strongly agree that the Act regulates social relations regarding environmental information. The mean score of 2.76 indicates a generally positive perception with a standard deviation of 1.23, reflecting moderate variability in opinions.

In comparison with other scholarly perspectives, a study by Jones et al., (2021) who emphasizes that legislation alone is insufficient without strong institutional frameworks and public engagement. They argue that effective environmental governance hinges on the actual application of laws rather than their existence. This aligns with the low approval rate, suggesting that even if the EPMA provides a legal framework, its impact may be limited by gaps in execution or public awareness. Moreover, research by Yalew et al., (2022) points out that public perception of environmental legislation is often influenced by recent environmental events and community involvement in decision-making processes. If stakeholders feel excluded or if the Act has not effectively addressed pressing environmental concerns, support is likely to wane, as evidenced by the low agreement rate.

4.6 The Possible Mechanisms for Addressing Environmental Management gaps in Mbarara District

Table 7: The Possible Mechanisms for Addressing Environmental Management gaps in Mbarara District

Items	SA (%)	A (%)	NS (%)	D (%)	SD (%)	Mean	Std Dev	Decision
Increasing public education and awareness campaigns about environmental issues	60 (45)	40 (30)	13 (10)	07 (5)	03 (2)	2.04	1.28	Low perception
Enhancing collaboration between	44 (33)	66 (50)	10 (8)	08 (6)	05 (4)	2.32	1.31	Low perception

government, NGOs, and local communities for better environmental management.								
Allocating more funding towards environmental conservation and sustainability initiatives	53 (40)	40 (30)	10 (8)	20 (15)	10 (8)	2.56	1.29	High perception
Strengthening enforcement of existing environmental regulations and policies.	42 (32)	41 (31)	20 (15)	15 (11)	15 (11)	2.39	1.22	High perception
Promoting sustainable practices and technologies to mitigate environmental impact (e.g., renewable	51 (38)	42 (32)	20 (15)	13 (10)	07 (5)	2.47	1.33	High perception

energy, waste management).								
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Note: N=133, SA=Strongly Agree, A=Agree, NS=Not Sure, D=Disagree and SD=Strongly Disagree, Decision-weighted average= 2.35

A total of 75 percent of respondents agree or strongly agree that increasing public education and awareness is crucial. Despite this, the mean score of 2.04 and the high standard deviation of 1.28 suggest that while a majority see it as important, there is significant variability in how strongly they feel about it. The low mean score might reflect that respondents believe this is not a priority compared to other strategies.

The finding resonates with a substantial body of recent literature where scholars have consistently highlighted the role of education and awareness in enhancing environmental management practices and fostering more sustainable behaviors. According to a 2023 review by Lee and Johnson, media and communication strategies play a crucial role in enhancing public understanding of environmental issues. They argue that effective communication strategies can bridge gaps in knowledge and stimulate greater public engagement. This perspective supports the idea that raising awareness through various media channels is a key component in addressing environmental management challenges.

A combined 83 percent of respondents support enhancing collaboration among government, NGOs, and local communities. However, the mean score of 2.32 and standard deviation of 1.31 indicate that while the idea is broadly supported, opinions on its effectiveness or priority are varied, with some respondents uncertain or dissenting.

The findings concur with Arnott and Duffy (2022) who highlights how collaboration among government agencies, NGOs, and local communities leads to more comprehensive and

contextually relevant environmental solutions. Their research illustrates that multi-stakeholder partnerships can mobilize a range of resources and knowledge, leading to more innovative and effective management strategies.

A total of 70 percent of respondents agree or strongly agree that more funding should be allocated to environmental initiatives. The mean score of 2.56 and standard deviation of 1.29 indicate a strong overall support for increased funding, reflecting a clear perception of its importance. This suggests that respondents see this as a critical area needing improvement.

For example, a 2023 paper by Carter and Roberts demonstrated that increased funding enables the development and deployment of new technologies and practices that can address emerging environmental challenges. The study argues that financial investment in research and innovation leads to more effective and scalable solutions, which are necessary for tackling complex environmental issues. Also, a 2023 study by Patel and Kumar found that limited financial resources often lead to compromised program implementation, reduced scope, and lower overall impact. Their findings indicate that insufficient funding can hinder the ability to monitor and enforce environmental regulations, thereby weakening the effectiveness of environmental management efforts.

Findings also show that majority 63 percent of respondents agree or strongly agree on the need to strengthen enforcement of environmental regulations. The mean score of 2.39 and a relatively lower standard deviation of 1.22 indicate a generally strong perception of the need for better enforcement, with less variability in opinions compared to other items.

The findings concur with a 2022 study by Cole and Miller, which noted that enforcement plays a critical role in ensuring that environmental regulations are not only established but also adhered to. Their research indicates that strong enforcement mechanisms are necessary to deter non-

compliance and to hold violators accountable, which ultimately leads to better environmental outcomes.

A combined 70 percent of respondents support promoting sustainable practices and technologies.

The mean score of 2.47, along with a standard deviation of 1.33, indicates strong support for this approach, though opinions vary somewhat. This reflects a consensus on the importance of sustainability but with some differences in how strongly it is prioritized.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

The study was about urbanization and environmental management in newly created town councils in Uganda; a case study of Mbarara District. In this chapter, the researcher presents the conclusion and recommendations concerning the study.

5.2 Conclusions

The current trend of urbanization in Mbarara District presents both significant challenges and opportunities for environmental management. Rapid growth increases environmental pressures, strains infrastructure, and complicates planning and regulation. However, there are opportunities to address these challenges through the integration of green infrastructure, community engagement, and policy reforms. By adopting sustainable practices, updating policies, and strengthening enforcement, Mbarara District can better manage the environmental impacts of urbanization and promote sustainable development.

Urbanization in Mbarara District presents both significant challenges and opportunities for environmental management. Increased environmental pressures, strain on infrastructure, and planning and regulation challenges are notable issues. However, integrating green infrastructure, promoting sustainable practices, engaging communities, and strengthening policies offer pathways to manage these impacts effectively. By addressing these challenges and leveraging opportunities for sustainable development, Mbarara District can navigate urbanization more successfully while protecting and enhancing its environmental resources.

The creation of town councils presents both opportunities and challenges for environmental management. While these councils can enhance local governance, they often face issues related

to capacity, coordination, enforcement, community engagement, and infrastructure. Addressing these challenges requires targeted efforts to build capacity, improve coordination, strengthen enforcement, engage communities, and upgrade infrastructure. By implementing these recommendations, town councils can more effectively manage environmental issues and contribute to sustainable urban development.

Current laws and policy mechanisms offer a foundational framework for managing environmental impacts related to urbanization. However, gaps in enforcement, policy fragmentation, outdated regulations, and equity issues present significant challenges.

Addressing environmental management gaps in Mbarara District requires a comprehensive and integrated approach. Enhancing public education, strengthening stakeholder collaboration, increasing funding, improving enforcement, promoting sustainable practices, and building robust legal and institutional frameworks are all essential components. By implementing these mechanisms, Mbarara District can better manage its environmental resources, achieve sustainable outcomes, and address the pressing environmental challenges it faces.

5.3 Recommendations

5.3.1 Recommendations for NEMA (National Environment Management Authority)

Revise and enhance existing environmental policies to better address urbanization challenges, ensuring they prioritize sustainability, conservation, and pollution reduction.

Promote urban greening projects that encourage the creation of parks, gardens, and green belts to counter the loss of green spaces due to urban expansion. Facilitate partnerships with local governments and community organizations.

Launch educational campaigns to raise awareness about the importance of environmental conservation and the impacts of urbanization. Focus on engaging schools, community groups, and local leaders.

Develop targeted initiatives to monitor and reduce pollution levels, focusing on air, water, and soil quality. Establish partnerships with local industries to promote cleaner production practices.

Work with local governments to enhance waste management practices, including waste segregation, recycling programs, and public awareness campaigns about responsible waste disposal.

Conduct regular assessments of human-environmental interactions to identify areas where urbanization is causing significant environmental degradation, enabling timely intervention.

Advocate for increased budget allocations for environmental conservation initiatives. Explore partnerships with international organizations and private sector investments to support funding efforts.

Formulate and implement clear and enforceable environmental policies that promote sustainability. Ensure these policies are aligned with local and national priorities and effectively address urbanization impacts.

Develop targeted outreach programs to raise awareness about the National Environment Action Plan and the National Environment Management Policy. Focus on educating stakeholders, including local governments, community organizations, and the general public, about the frameworks and their importance in sustainable development.

Strengthen NEMA's role in coordinating, monitoring, and regulating environmental activities by enhancing communication with various stakeholders. Develop a centralized system for

tracking compliance and reporting on environmental issues.

5.3.2 Recommendations for Local Community Members

Participate actively in local planning meetings and forums to voice concerns about urbanization and its effects on green spaces and the environment. Advocate for sustainable development practices that prioritize environmental health.

Organize and participate in community education campaigns focused on environmental conservation. Use local platforms such as schools, community centers, and social media to raise awareness about the importance of preserving green spaces and reducing pollution.

Actively report any environmental concerns, such as pollution or illegal dumping, to local authorities. Use community platforms to raise awareness about these issues and mobilize collective action.

Advocate for responsible land use and development projects that prioritize environmental sustainability. Collaborate with local planners to ensure that new developments consider environmental impacts.

Participate in or initiate local conservation projects, such as tree planting, clean-up drives, and waste recycling programs. These actions can foster a sense of community and responsibility towards the environment.

Organize community groups to engage with local government officials and advocate for the development and enforcement of comprehensive environmental policies and regulations.

Organize workshops and community meetings to educate residents about the importance of environmental policies, including the National Environment Action Plan (NEAP) and the National Environment Act, 2019.

Distribute informative materials (brochures, flyers) that explain local environmental issues and sustainable practices

5.3.3 Recommendations for NGOs (Non-Governmental Organizations)

Work with policymakers to advocate for stronger environmental regulations and sustainable urban planning practices. Provide evidence-based recommendations and support policy reforms.

Launch campaigns to raise awareness about environmental issues and push for policy changes at both local and national levels.

Initiate and support local conservation projects that address urbanization impacts, such as habitat restoration, pollution reduction, and community engagement programs.

Facilitate partnerships between communities, government agencies, and private sector organizations to address environmental challenges collaboratively.

5.3.4 Recommendations for the Government

Develop comprehensive urban planning policies that integrate environmental sustainability with development goals. Promote mixed-use development, green building standards, and sustainable transportation options.

Provide incentives for developers and businesses to adopt sustainable practices, such as tax breaks for green infrastructure investments and grants for environmental projects.

Invest in and support the development of green infrastructure, such as parks, green roofs, and sustainable drainage systems, to mitigate the environmental impacts of urbanization.

5.4 Areas for Further Studies

The Study Suggests that Further Studies be done on;

The Effectiveness of Environmental Management Strategies in Mbarara District. The study established that majority of the respondents have a perception that current environmental management strategies are inadequate. Evaluating these strategies will help identify gaps in policy implementation and effectiveness, guiding improvements and community involvement.

An Assessment of the Green Space Loss in Mbarara District. The study established that there is a high perception that urbanization has led to a decrease in green spaces. This necessitates a detailed assessment of current green space availability and its ecological benefits. Understanding how this loss affects local biodiversity, air quality, and community health is crucial for developing strategies to preserve or restore these areas.

The Impact of Urbanization on Green Spaces. The study found out that there is a high perception that urbanization has led to a reduction in green spaces. This makes it important to quantitatively assess the current status and ecological functions of these spaces. Understanding the implications of green space loss on biodiversity and community health is essential.

Community Awareness and Education Programs. Findings of the study show a gap **in community awareness regarding environmental conservation efforts. Understanding knowledge levels and attitudes can inform better educational strategies and community engagement initiatives.**

The Effectiveness of the National Environment Action Plan (NEAP) on Environmental Conservation and Management in Mbarara District. The study established that there is a low perception of NEAP's effectiveness in addressing environmental management gaps indicates a

need for thorough evaluation. Understanding its practical impact can help identify barriers to successful implementation.

The Impact of Sectoral Policies on Environmental Management. The recognition of the need for sectoral policies implies that they could play a significant role in addressing specific environmental issues. Analyzing their effectiveness and integration is crucial for comprehensive environmental management.

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LIST OF APPENDICES

APPENDIX 1: A QUESTIONNAIRE FOR THE LOCAL COMMUNITY MEMBERS, PARISH CHIEFS AND COUCILORS

Dear respondent,

I am *Byaruhanga Arthur*, a student from Bishop Stuart University, conducting a study on “*Urbanization and Environmental Management in Newly Created Town Councils in Uganda; a case Study of Mbarara District*”. This questionnaire seeks to collect data on the above stated topic which will be used for academic purposes as a requirement for the award of a Master of Public Administration and Management of Bishop Stuart University.

SECTION A: BIOGRAPHIC DATA

1. Gender of the Respondent

Male	Female
1	2

2. Age of the Respondent

18- 28 years	39- 48 years	49 years and above
1	2	3

3. Education Level

Never been to School	Primary	Secondary	Diploma	Degree	Postgraduate
1	2	3	4	5	6

4. Village:

.....

5. Parish:

.....

6. Sub-county:

.....

7. Responsibility in the Community:

.....

SECTION B: The current trend of Urbanization and environment management in Mbarara district

In the table below, Strongly Agree=5, Agree=4 Not Sure =3, Disagree=2, and Strongly Disagree=1.

SN	Items	SA	A	NS	D	SD
1	Urbanization in Mbarara District has significantly increased in the past 5 years					
2	The increase in urbanization has led to a decrease in green spaces in Mbarara					

	District.					
3	Urbanization has improved the economic opportunities in Mbarara District					
4	Urbanization has contributed to better infrastructure development in Mbarara District					
5	Urbanization has caused significant pollution issues in Mbarara District					
6	Water quality in Mbarara District has deteriorated due to urbanization.					
7	Urbanization has led to the destruction of wetlands in Mbarara District.					
8	There are effective environmental management strategies in place in Mbarara District					
9	The local government is actively involved in managing the environmental impacts of urbanization					
10	Residents are aware of the importance of environmental conservation in urban areas					
11	Urbanization has led to increased air pollution in Mbarara District. ¹					
12	There are adequate green spaces (parks, gardens) in urban areas of Mbarara District					
13	Waste management systems in urban areas of Mbarara District are effective					
14	Future urbanization plans should prioritize environmental sustainability.					

SECTION C: The effect of urbanization on environment management in Mbarara district

In the table below, Strongly Agree=5, Agree=4 Not Sure =3, Disagree=2, and Strongly Disagree=1.

SN	Questionnaire Item	SA	A	NS	D	SD
1	Urbanization in Mbarara District has led to the reduction of green spaces					
2	Pollution levels have increased in Mbarara District due to urbanization.					
3	The value of environment has been hurt and hence man undertake development activities without giving attention to the impacts of his Activities					
4	Urbanization has led to degradation of environmental resources which are meant to cater for both present and future generations					
5	Growth of urban population leads to increased demand for housing facilities, more educational and health facilities together with other facilities which support human's life					
6	Urbanization also calls for more resources such water, land					

	and energy to be subjected into use					
7	Urbanization has increased human-environmental interaction					
8	Urbanization leads to poor waste management which ends up in water bodies polluting the water					
9	The local government is effectively managing environmental issues caused by urbanization.					
10	Urbanization has negatively impacted water quality in Mbarara District.					
11	Community awareness about environmental conservation in urban areas of Mbarara District is sufficient.					

SECTION E: The challenges experienced in environmental management due to created town councils

Questionnaire Item		SA	A	NS	D	SD
1	There is a lack of environmental policies and regulations to enforce environmental sustainability and monitor the practices of construction organizations					
2	Insufficient funding for environmental conservation efforts is a major challenge.					
3	Lack of public awareness about environmental issues hinders effective management					
4	Lack of industry standards, comprehensive rules and regulations that leads to poor Environmental Management plans implementation and clearly defined responsibilities					
5	Political interference affects decision-making processes related to environmental management.					
6	Lack of initiatives such as financial facilitation and mandates for environmental Management plans implementation					
7	Poor knowledge and awareness make EMP implementation unnecessary					

	due to the lack of motivation					
8	Climate change poses significant challenges to environmental sustainability efforts					

**SECTION F: The Current Laws or Policy Mechanisms Supporting
Environmental Management in Relation to Urbanization.**

In the table below, Strongly Agree=5, Agree=4 Not Sure =3, Disagree=2, and Strongly Disagree=1.

Questionnaire Item		SA	A	NS	D	SD
1	The National Environment Action Plan (NEMP) provides a framework for addressing gaps in environment management					
2	NEMP provides sustainable social and economic development which maintains or enhances environmental quality					
3	The policy also recognizes the need for sectoral policies in addressing the specific concerns of the identified environmental sectors.					
4	The National Environment Act, 2019 provides for the management of the environment for sustainable development					
5	The National Environment Management Authority coordinates, monitors, regulates and supervises all activities relating to the environment.					

6	The environmental protection and management Act (No. 10 of 2019) seeks to ensure that decisions pertaining to the environment are made in an integrated manner, in collaboration with appropriate authorities					
7	The Act also regulates the social relations with regard to collection of, and access to, environmental information					

SECTION G: The possible mechanisms for addressing environmental management gaps

in Mbarara District

Questionnaire Item		SA	A	NS	D	SD
1	Increasing public education and awareness campaigns about environmental issues					
2	Enhancing collaboration between government, NGOs, and local communities for better environmental management.					
3	Allocating more funding towards environmental conservation and sustainability initiatives					
4	Strengthening enforcement of existing environmental regulations and policies.					

5	Promoting sustainable practices and technologies to mitigate environmental impact (e.g., renewable energy, waste management).					
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**APPENDIX 2: EKIHANDIKO KYO’KUGARUKAMU EBIBUZO BYA’ BAKULU
BEBYANGA, BAKURU BE MIRUKA HAMWE NA’ ABOKUZWEKYERA EMIRUKA
AHA RURENGO RWEGOMOBORORA HAMWE NA DISTURIKITI.**

Munywani wangye,

Ninyetwa ***Byaruhanga Arthur***, omwegi wa itendekyero eryahaiguru aririkumanywa nka Bishop Stuart, Ninshoma diguri yakabiri omu kurebuza hamwe nana okutereza entura yabantu. Ninkora okucondoza ahari “akazaare akari aha Enkurakurana ya’ matawuni hamwe nana okukuma obuhangwa omu towuni ensya ezirikuhangwaho omu Mbarara disturikiti omuri Uganda” WEbibuzo ebi bigyendereire okurundana ebirikukwata aha kyagambwa aharuguru kandi nibyiza kukoze sibwa ahabwo kushoma kwonka.

EKIKWEKA A: EBIRIKUKUKWATAHO

1. Obuhangwa bwawe

Omushaija	Omukazi
1	2

2. Emyaka yaawe

18 kuza 28	39 kuza 48	49 okugaruka ahaiguru
1	2	3

3. Okushoma kwaawe

Tindashomire	Primare	Siniya	Nkajwar a Diporom a	Nkajwar a Diguri	Ndengize aha Diguri
1	2	3	4	5	6

4. Ekyaro:

.....

5. Omuruka:

.....

6. Egomborora:

.....

7. Omurimo gwaawe:

Ekikweka B: Empinduuka ensya eri omu kukurakurana kwa'matawuni omuri

Mbarara Disturikiti

Shooma, torana deru Okyebere ekihikire, Maziima Ninyikiriza=5, Ninyikiriza=4

Tidikumanya =3, Tindikwikiriza=2, and Maziima Tindikwikiriza=1.

Enamb a	Ebibuzo	5	4	3	2	1
1	Disturikiti eyiine amatawuni mahango ahabwa'enkurakurana ya'matawuni.					
2	Abantu bingi omuri Mbarara nibatuura omu tawuni.					
3	Amatawuni nigatuuza abantu barikuruga omu mahanga gatarikushushana hamwe nana ediini zitarikushushana.					
4	Okuza omu tawuni kuturamu kwebembeirwe eminyeto erikureeba ngu emigisha mingi eri omu tawuni.					
5	Okukura kurana nana okuhanguha kwa'matawuni kuretsire					

	enkurakurana omu byesente.					
6	Enkurarakurana yamatawuni ebiiro ebi nemanywa kurungi.					
7	Abantu abarikubera omu tawuni bakanyire ahabwa enkurarakurana yahiguru omu kuhangaho nana okukurakurana kwa'matawuni.					
8	Disturikiti ya Mbarara eyiine amatawuni mingi omu Uganda.					

Ekikweka C: Empinduka eri omu kukuma ebyo’buhangwa omuri Mbarara

Disturikiti.

Enamb a	Ebyokushoma	5	4	3	2	1
1	Hariho okucwekyereza ebisharara ahabwa emirimo ya’abantu.					
2	Eshuro zamaizi zisisirwe ahabw’emirimo yabantu omu kicweka ekyi.					
3	Abantu bingi nibateema ebibira barikuronda enku hamwe n’embaho.					
4	Abantu niabwa ebibira bisya kandi nana abarikutema emiti babyara endizo.					
5	Ebitongore ebirikurebuza obuhangwa nibibinga abantu mu bisharara.					
6	Emiti nesimbwa ahamuhegyeyo gw’emigyera.					

Ekicweka D: Ebirikuruga omu nkurakurana ya'matwuni aha kukuuma ebyobuhangwa omuri Mbarara Disturikit.

Shooma, torana deru Okyebere ekihikire, Maziima Ninyikiriza=5, Ninyikiriza=4

Tidikumanya =3, Tindikwikiriza=2, and Maziima Tindikwikiriza=1.

Enamb a	Ebyokshoma	5	4	3	2	1
1	Omugasho gw'ebuhangwa gushishirwe ahabwa emitwarize miibi yabantu omukukora emirimo yabo.					
2	Okukurakurana kw'amatuwuni kishisire ebyobuhangwa ebitwehinguririze.					
3	Okweyongyera kwa'bantu omu ma tawuni kiretsireho okwetenga munonga amaju, ebyo'bwegyese, eby'amagara hamwe nana ebindi ebirikuyamba abantu.					
4	Okukurakurana kw'amatuwuni kuretsire amaizi, eitaka hamwe na ebywa amashanyarazi kukoze sibwa munonga.					
5	Okukurakurana kw'amatuwuni kukanyise akakwate ko'montu					

	nana ebimwehingiririze.					
6	Abantu abari kutura omu mihegyeyo y'etawuni nibatura omu mihegyeyo yemigyera, empanga, haihi nana emyanya erikurundanwamu kasasiro nana omumaju mabi.					
7	Okukurakurana kw'amatuwuni kukanyise oburofa omu maizi.					

8	Okukurakurana kw'amatuwuni kwiine akakwate nana okushisikara kwa omwika gw'omumwanya ekiretsirwe amakorero hamwe nana amamotoka.					
9	Okwombeka, okunogora amatofari hamwe nana okuhinga kusitsire ebisharara.					

Ekicweka E: Ebizibu Ebirikushangwa omu kukuma eby'obuhangwa ahabwa amatawuni agarikutandikwaho.

Ebyokushoma		5	4	3	2	1
1	Tihariho biragiire by'okukuma obuhangwa hamwe nana emirimo yabantu.					

2	Abantu bingi tibarikumanya ebiragiiri by'okukuma obuhagwa.					
3	Obutabaho bw'ebiragiiri bya'makorero kishishire ebyobuhangwa.					
4	Eihanga tilyine sente zikumara omu kukuma eby'obuhangwa.					
5	Abantu tibarkumnya ebirungi ebiri omu kurinda obuhangwa.					
6	Obwengye bukye nana obutamnya omu bantu birermise okuta omunkora ebiragiiri by'okukuma eby'obuhangwa.					

Ekicweka F: Ebiragiiro ebiriho ahabw’okurinda obuhangwa omu matawuni.

Ebyokushoma		5	4	3	2	1
1	Entekateka erikukora ahabyo’buhangwa gyete “The National Environment Action Plan (NEMP)” neshoborora ebiziibu ebiri omu kukuma obuhangwa.					
2	Entekateka erikukora ahabyo’buhangwa gyete “The National Environment Action Plan (NEMP)” neretaho entura nungi omu bantu kandi ekumire ebyo’buhangwa.					
3	Entekateka erikukora ahabyo’buhangwa gyete “The National Environment Action Plan (NEMP)” nirigamba agandi mateeka omukurinda obuhangwa omu bitongore bya gavumenti.					
4	Entekateka erikukora ahabyo’buhangwa gyete “The National Environment Action Plan (NEMP)”, eya 2019 nirigamba ngu nihetagwa okukuma obuhangwa ahabw’oburungi bwanyestsya.					

5	Abamateeka g'ebyobuhangwa nigagaita, garebuza emirimo yona eyiine akakwate nana obuhangwa.					
6	Entekateka erikukora ahabyo'bugangwa gyete "The National Environment Action Plan (NEMP)" erya 2019 nirigamba ngu ensharamu zooni eyiine akakwate ahabyobuhangwa zigaitwe hamwe okurabira omukukoraga kurungi nana abikirikukwataho.					
7	Entekateka kandi nirikuma entuura yabantu omu kutunga okumanyisibwa ahabyobuhangwa.					

APPENDIX III: KEY INFORMANT INTERVIEW GUIDE

Dear Sir/Madam,

I am **Arthur**, a post-graduate student of Bishop Stuart University conducting academic research titled **“urbanization and environmental management in newly created town councils in Uganda”**. You have been identified as a resourceful person to participate in the study, which is strictly for academic purposes. I therefore humbly request you to participate in the interview by responding to the following questions because your opinions are very important to this study and the information given will be treated with the highest degree of confidentiality. Feel free to ask any questions about the study before I begin the interview.

1. Can you describe your observations regarding the recent trends in urbanization within Mbarara District?
2. In your opinion, what are the key factors driving urbanization in Mbarara District?
3. How do you perceive the impact of urbanization on natural resources such as water bodies, forests, and agricultural land?
4. What challenges, if any, have emerged due to the current trends of urbanization in terms of environmental sustainability?
5. From your perspective, what specific environmental impacts have you observed as a result of urbanization in Mbarara District?
6. How has urbanization influenced the quality of air, water, and soil in the area?
7. Are there any notable changes in biodiversity or ecosystem health that you attribute to urbanization?
8. In what ways have local environmental management practices adapted or changed in response to urbanization?

9. What are the perceived long-term consequences of unchecked urbanization on environmental sustainability in Mbarara District?
10. Can you describe the existing legal framework governing environmental management in Mbarara District?
11. How effective do you believe these environmental laws and regulations are in addressing current challenges?
12. Are there any gaps or shortcomings in the enforcement of environmental laws that you have observed?
13. How do stakeholders, including local communities and businesses, perceive and comply with environmental regulations?
14. What do you perceive as the most significant challenges facing environmental management in Mbarara District today?
15. Are there specific obstacles hindering effective collaboration between stakeholders in environmental management initiatives?
16. From your experience, what successful practices or strategies have been implemented to address environmental management gaps in other regions?
17. Based on your insights, what recommendations would you propose to overcome current environmental management challenges in Mbarara District?

Thank you for your participation

APPENDIX IV: OBSERVATION CHECKLIST

LOCATION.....DATE.....

ITEM	KEY FEATURES/SUBJECT S			COMMENT
Reclaimed wetlands				
Water bodies				
Newly planted trees				
Cut down trees				
Human activities that affect environment				

APPENDIX V: WORK PLAN

S/ N	Task	Time frame	Responsible person
1	Research Concept development and presentation.	August 2023	Student
2	Proposal write up and presentation	October 2023 – February 2024	Student
3	Submission of the proposal to REC	April 2023 ⁴	Student
4	Review of the proposal by REC	May 2024	REC Reviewer
5	Hiring of research assistants	May 2024	
6	Field data collection	May – June 2024	Student
7	Data analysis and report writing	June 2024	Student
8	Presentation of first draft report	June 2024	Student / Research Assistants
9	Handing in of the Final report	July 2024	Student
1 1	Publishing of outcomes	July 2024	Student

APPENDIX VI: BUDGET

Items to use during research process	Quantity	Unit cost/ite m (shs)	Total Amount (UGX)
Typing, Printing and photocopying	Assorted	150,000	150,000
Research assistants for data collection	6	200,000	800,000
Transport to the field (too and from)			200,000
Soda and water for participants	133	4000	532,000
Binding	4 copies	45,000	180,000
Feeding research assistants	6	20,000	120,000
Publishing	Assorted	Assorted	1,000,000
Administration (REC fee)	1	190,000	195,000
Miscellaneous	Assorted	Assorted	500,000
Total			3,677,000

APPENDIX VII: COMMUNITY ENGAGEMENT PLAN

The study aims to investigate the effect of urbanization on environmental management in newly created town councils in the Mbarara district. The engagement plan is designed to ensure active participation and collaboration with the community throughout the research process.

Pre-Engagement Phase

- The researcher will identify key stakeholders including local community members, community leaders, non-governmental organizations (NGOs), civil society organizations (CSOs), government agencies, academic institutions, and businesses.
- The researcher will Map out their roles, interests, and potential contributions to the community engagement process
- This will be followed by conducting initial meetings with stakeholders to introduce the research project, discuss its objectives, and understand the community's needs, concerns, and expectations regarding agricultural research and development.
- The researcher will set up communication channels such as community meetings, phone helplines, and social media groups to facilitate ongoing dialogue and information sharing throughout the engagement process.
- The researcher will then develop informational materials about the research project, including flyers, posters, and brochures, translated into local languages, to ensure accessibility and understanding by all community members.

Engagement Phase

- The researcher will organize community meetings and workshops to provide detailed

information about the research project, its objectives, methodologies, and expected outcomes. He will encourage active participation, questions, and feedback from community members.

- The researcher will use diverse communication channels such as community radio, posters, and social media to publicize the meetings.
- The researcher will organize community consultation meetings in various locations within Mbarara District to ensure broad participation.
- The researcher will use diverse communication channels such as community radio, posters, and social media to publicize the meetings.

Post-Engagement Phase

- The researcher will organize community meetings and workshops to share the findings of the research project with stakeholders. Resent the results will be presented in a clear and understandable manner, highlighting the implications for local agricultural practices and potential benefits to the community.
- The researcher will establish feedback mechanisms to solicit input from community members and stakeholders throughout the engagement process. The researcher will create opportunities for two-way communication, active listening, and constructive dialogue.
- The researcher will collaborate with local experts, government agencies, and NGOs to deliver training sessions on topics such as waste management, water conservation, and biodiversity conservation.
- Feedback from community members regarding their experiences and perceptions of the research project will be solicited. The researcher will develop monitoring and

evaluation frameworks to assess the effectiveness and impact of community engagement activities.

Continuous Engagement

- The researcher will provide ongoing support and follow-up to community members who participated in the research project, offering guidance, technical assistance, and access to resources as needed. Maintain open communication channels to address any further questions or concerns.
- The researcher will then work with local government agencies and policymakers to integrate the research findings and recommendations.

APPENDIX VIII: COVID-19 MITIGATION PLAN

This COVID-19 Mitigation Plan aims to ensure the safety and well-being of all participants involved in the study while adhering to guidelines and protocols set forth by health authorities. The study seeks to investigate the effect of urbanization on environmental management in newly created town councils in the Mbarara district, and it is imperative to implement stringent measures to mitigate the risk of COVID-19 transmission during research activities.

Social distancing

To ensure social distancing, the researcher will;

- Limit the number of participants in field activities and workshops to ensure adequate spacing between individuals.
- Mark designated areas for seating and standing to maintain a safe distance of at least 1-2 meters.
- Organize activities in outdoor settings whenever possible to facilitate better airflow and social distancing.
- Encourage participants to refrain from physical contact such as handshakes or hugs.

Mobilization/Transportation

- To harmonize Mobilization/Transportation, the researcher will;
- Arrange for multiple transportation vehicles with reduced passenger capacity to allow for social distancing during travel to and from research sites.
- Require participants to wear face masks while traveling and provide hand

- sanitizers in vehicles.
- Implement staggered departure and arrival times to avoid crowding during transportation.

Cleaning and disinfecting

To ensure cleaning and disinfecting, the researcher will;

- Ensure regular cleaning and disinfect high-touch surfaces such as door handles, tables, chairs, and equipment used during field activities.
- Provide disinfectant wipes or sprays for participants to sanitize their hands and personal belongings.
- Allocate sufficient time between sessions for thorough cleaning and disinfection of research facilities and equipment.

Personal hygiene

Hygiene will be ensured through;

- Promoting frequent hand washing with soap and water for at least 20 seconds, especially before and after handling food, equipment, or touching surfaces.
- Providing hand washing stations or hand sanitizers at convenient locations throughout research sites.
- Encouraging participants to cover their mouth and nose with a tissue or elbow when coughing or sneezing and dispose of used tissues properly.

Monitoring and Enforcement

Monitoring will be handled through;

- Designating a COVID-19 safety officer responsible for monitoring compliance with mitigation measures and addressing any concerns or issues that arise.
- Conducting regular health screenings, including temperature checks, for all participants before entering research sites.
- Clearly communicating mitigation protocols and expectations to all participants through training sessions, signage, and written guidelines.

Contingency planning

- Contingency plans will be developed in case of suspected or confirmed COVID-19 cases among participants, including procedures for isolation, contact tracing, and medical assistance.
- Establish communication channels will be established for reporting symptoms or potential exposures and provide guidance on seeking medical attention if needed.
- By implementing this COVID-19 Mitigation Plan, the researcher aims to prioritize the health and safety of all participants involved in the study while minimizing the risk of COVID-19 transmission. These measures will ensure that research activities can proceed effectively while adhering to recommended guidelines and protocols.

APPENDIX IX: COMPENSATION OF RESPONDENT’S TIME

This compensation plan will acknowledge and appreciate the valuable time and efforts contributed by respondents participating in the study titled “Urbanization and Environmental Management in Newly Created Town Councils in Mbarara district.” This plan is designed to ensure fair and ethical treatment of participants while recognizing the significance of their input to the research.

Honorarium

Each participant will receive a fixed honorarium for their time and contribution to the study. The honorarium amount will be communicated transparently to participants at the beginning of their involvement in the study.

Travel reimbursement

Participants who incur travel expenses related to their involvement in the study will be eligible for reimbursement. Reimbursement rates and procedures will be clearly outlined, taking into account the distance traveled and local travel norms.

Incentive bonus

An additional incentive bonus may be provided to participants who consistently and actively engage in the study over an extended period. Criteria for eligibility and the bonus amount will be communicated in advance.

Knowledge dissemination

Participants will have the opportunity to receive a summary of the study's findings once it is concluded. This not only serves as an acknowledgment of their contribution but also

promotes transparency in the research process.

Payment process

The honorarium and any applicable bonuses or reimbursements will be disbursed promptly upon the completion of the participant's involvement in the study. Payments will be made using a method convenient for participants, such as bank transfers, mobile money, or another agreed-upon method. Participants seeking reimbursement for travel expenses will be required to provide valid receipts or other supporting documentation.

Communication

All details regarding compensation, including amounts, eligibility criteria, and payment processes, will be clearly communicated to participants at the outset of their involvement in the study. Participants will have access to a designated contact person who can address any queries or concerns related to compensation.

APPENDIX X: RESULTS DISSEMINATION PLAN

This Results Dissemination Plan outlines a comprehensive strategy for effectively communicating and sharing the findings of the study titled “Urbanization and Environmental Management in Newly Created Town Councils in Mbarara district” The plan aims to ensure transparency, accessibility, and meaningful engagement with stakeholders.

Stakeholders

Study participants will be provided with a summary of the study's results, ensuring they can access and understand the outcomes of their contribution.

Community meetings or workshops will be organized to share the findings with local community. Accessible materials, such as infographics or pamphlets will be developed to convey key results to a broader audience. These gatherings will provide a platform for open dialogue, allowing community members to voice their concerns, suggestions, and priorities regarding environmental issues.

The educational materials will be developed and awareness campaigns conducted to inform the community about environmental conservation practices, the importance of protecting natural resources, and the potential impacts of environmental degradation on their health and livelihoods.

Regular communication channels will be maintained between government agencies and local communities to share updates on project outcomes, solicit feedback, and ensure ongoing collaboration in environmental conservation and rural development efforts.

A research paper will be submitted to peer-reviewed journals for publication. The findings

will be presented at conferences and seminars to engage with the academic and research community.

Dissemination Methods

a. Publications

The researcher will publish a comprehensive research report detailing the study's methodology, results, and conclusions. He will also prepare an academic paper for submission to relevant journals.

b. Workshops and webinars

The researcher will organize in-person or virtual workshops and webinars to present and discuss study findings with stakeholders. He will also facilitate Q&A sessions to address queries and concerns.

c. Community meetings

Community meetings will be conducted in key locations within the study area to directly engage with local communities. This will be achieved by use of accessible language and visual aids to convey complex information.

d. Online Platforms

The researcher will establish a dedicated website or online platform to host study materials, including reports, infographics, and other relevant resources. He will also leverage social media channels to share key findings and engage with a broader online audience.

Timeline

The researcher will share initial highlights and key findings through press releases and social media immediately after data analysis is complete.

Community meetings and workshops will be conducted within one month of completing data analysis to ensure timely information dissemination.

A research paper will be submitted to peer-reviewed journals within three months of completing the study.

The researcher will continue to disseminate information through various channels over the following six months to ensure sustained engagement and awareness.

Appendix XI: MONITORING AND EVALUATION FRAMEWORK TEMPLATE

Introduction

This Monitoring and Evaluation (M&E) framework is designed to assess the effectiveness and impact of community engagement activities in the study of urbanization and environmental management in newly created town councils in the Mbarara district. The framework will provide a structured approach to track progress, measure outcomes, and ensure that the community engagement objectives are met.

Objectives of the M&E Framework

- ❖ To monitor the implementation of community engagement activities.
- ❖ To evaluate the effectiveness of engagement strategies.
- ❖ To assess the impact of community engagement on environmental management practices.
- ❖ To provide feedback for continuous improvement.

Key Components

- a) Indicators
- b) Data Collection Methods
- c) Data Sources
- d) Frequency of Data Collection
- e) Responsible Parties
- f) Data Analysis and Reporting

Objective	Indicator	Data Collection Method	Data Source	Frequency of Data Collection	Responsible Party	Data Analysis and Reporting
Monitor implementation of community engagement activities	Number of community meetings held	Attendance sheets, meeting minutes	Meeting records	Weekly	Researcher	Monthly progress reports
Evaluate effectiveness of engagement strategies	Level of community participation	Surveys, feedback forms	Community members	Monthly	Researcher	Monthly evaluation reports
Assess the impact on environmental management practices	Changes in environmental practices	Observations, interviews	Local community, and environment reports	Monthly	Researcher, local authorities	Impact reports

Provide feedback for continuous improvement	Stakeholder satisfaction	Surveys, feedback forms	Stakeholders (community members, NGOs, government agencies)	Two months	Researcher	Review reports
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Indicators

Process Indicators: Track the implementation of activities (e.g., number of meetings, workshops conducted).

Outcome Indicators: Measure the immediate results of activities (e.g., level of community participation, stakeholder satisfaction).

Impact Indicators: Assess the long-term effects on the community and environment (e.g., changes in environmental practices, improvement in water quality).

Data Collection Methods

Surveys and Questionnaires: To gather quantitative data from community members and stakeholders.

Interviews: To collect qualitative insights from key informants.

Observation Checklists: To systematically record changes in the environment.

Review of Records and Reports: To analyze documentation from meetings and workshops.

Data Sources

Community members

Local community leaders

NGOs

Government agencies

Academic institutions

Responsible Parties

Researcher: Overall coordination and data collection.

Local Authorities: Support in data collection and providing necessary records.

NGOs: Assistance in engaging the community and collecting feedback.

Data Analysis and Reporting

Data will be analyzed using both qualitative and quantitative methods.

Reports will be generated to summarize findings and provide recommendations.

Monthly, quarterly, biannual, and annual reports will be shared with stakeholders.

Feedback Mechanisms

Regular meetings with stakeholders to discuss findings and gather feedback.

Adjustments to the engagement strategies based on feedback received.

Continuous improvement of the M&E framework based on lessons learned.

APPENDIX XII RESEARCH PROJECT FLYER

TITLE	Investigating the Effect of Urbanization on Environmental Management in Newly Created Town Councils: A Case Study of Mbarara District
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Introduction

Urbanization is a significant driver of development. However, its impact on environmental management, especially in newly created town councils, requires thorough investigation. This study focuses on understanding these effects within the Mbarara District.

Objectives

General Objective	Examine the impact of urbanization on environmental management in Mbarara District's newly created town councils.
Specific Objectives	1. Establish current trends in urbanization and wetland management in Mbarara District. 2. Assess the impact of urbanization on environmental management in Mbarara District. 3. Evaluate current laws and challenges in environmental management and suggest mechanisms for addressing gaps.

Key Activities

- Community meetings and workshops to discuss research goals and gather feedback.
- Surveys and interviews with local community members and stakeholders.
- Development and distribution of informational materials in local languages.

How to Get Involved

- Attend our community meetings and workshops.
- Participate in our surveys and interviews.

Contact Information

BYARUHANGA ARTHUR

22/BSU/MAPAM/1822

0704437979

Stay Informed and Participate

APPENDIX XIII: OBSERVATION CHECKLIST

Research Topic: URBANISATION AND ENVIRONMENTAL MANAGEMENT IN NEWLY CREATED TOWN COUNCILS IN UGANDA. A CASE STUDY OF MBARARA DISTRICT

Objective: To systematically observe and document key variables related to urbanization and environmental impacts in Mbarara District.

General Information

Date of Observation: _____

Location/Area: _____

Observer Name: _____

Weather Conditions: _____

1. Urbanization Trends

A. Land Use Changes

Conversion of Agricultural Land

☐ No change

☐ Partial conversion

☐ Complete conversion

Notes: _____

Forested Areas

☐ Intact

☐ Partially cleared

☐ Completely cleared

Notes: _____

Wetlands

☐ Intact

☐ Partially filled

☐ Completely filled

Notes: _____

B. Infrastructure Development

New Roads

☐ None

☐ Few

☐ Extensive

Notes: _____

New Buildings

☐ Residential

☐ Commercial

☐ Industrial

Notes: _____

Public Facilities

☐ Schools

☐ Hospitals

☐ Recreational Areas

Notes: _____

C. Housing Patterns

Type of Housing Structures

☐ Traditional

☐ Modern

☐ Mixed

Notes: _____

Density of Residential Areas

☐ Low

☐ Medium

☐ High

Notes: _____

2. Environmental Impact

A. Water Bodies

Condition of Rivers, Lakes, and Wetlands:

☐ Clean

☐ Slightly Polluted

☐ Heavily Polluted

Notes: _____

Signs of Pollution

☐ No pollution

☐ Visible trash

☐ Industrial discharge

Notes: _____

Sedimentation

☐ None

☐ Moderate

☐ Severe

Notes: _____

B. Air Quality

Sources of Pollution

☐ Vehicular emissions

☐ Industrial emissions

☐ Dust/Smoke

Notes: _____

C. Soil Erosion

Signs of Soil Degradation

☐ None

☐ Minor erosion

☐ Severe erosion

Notes: _____

Loss of Vegetation Cover

☐ None

☐ Partial loss

☐ Complete loss

Notes: _____

D. Waste Management

Presence of Waste Disposal Sites

☐ None

☐ Few

☐ Many

Notes: _____

Types of Waste

☐ Organic

☐ Plastic

☐ Hazardous

Notes: _____

Waste Management Practices

☐ Proper disposal

☐ Improper disposal

☐ Burning

Notes: _____

3. Compliance with Environmental Regulations

A. Protected Areas

Forests

☐ Protected

☐ Encroached

☐ Cleared

Notes: _____

Wetlands

☐ Protected

☐ Encroached

☐ Drained

Notes: _____

B. Industrial Activities

Compliance with Pollution Control Measures

- ☐ Compliant
- ☐ Partially compliant
- ☐ non-compliant

Notes: _____

Waste Disposal Regulations

- ☐ Followed
- ☐ Partially followed
- ☐ Not followed

Note: _____

4. Community and Socio-Economic Impact

A. Public Health

Health Issues Related to Environmental Degradation

- ☐ None
- ☐ Some cases
- ☐ Many cases

Notes: _____

B. Livelihoods

Impact on Agricultural Activities

- ☐ None
- ☐ Minor
- ☐ Major

Notes: _____

Additional Observations

Observer's Signature: _____

Date: _____

APPENDIX XVI: INFORMED CONSENT FORM



BISHOP STUART UNIVERSITY RESEARCH ETHICS COMMITTEE

P.O. Box 09 Mbarara-Uganda Tel: +256 485-

433468 E-mail: rec@bsu.ac.ug

STUDY TITLE: URBANISATION AND ENVIRONMENTAL MANAGEMENT IN
NEWLY CREATED TOWN COUNCILS IN MBARARA DISTRICT

PRINCIPAL INVESTIGATOR:

BYARUHANGA ARTHUR 22/BSU/MAPAM/1822

Introduction

Dear Sir /Madam,

You are invited to participate in a research study titled “Urbanisation and Environmental Management in Newly Created Town Councils in Mbarara District.” The purpose of this consent form is to provide you with clear and complete information about a research study being conducted in the Mbarara District.

Leave blank for REC office only: BSU-REC Stamp:	REC OFFICE USE ONLY: APPROVAL DATE: APPROVED CONSENT IRB VERSION NUMBER: PI NAME: IRB NO:
--	--

Brief background to the study

Global urbanization transforms sparsely populated areas into densely populated cities, driven by factors like population growth and migration, but it brings significant environmental challenges such as deforestation, habitat destruction, water depletion, and pollution, adversely affecting biodiversity and human health. With over half of the world's population expected in urban areas by 2030, sustainable urbanization is critical, especially in rapidly growing regions like Africa and Asia, as outlined by global agendas such as the Sustainable Development Goals and the New Urban Agenda. In Uganda, urban expansion poses serious threats, particularly to wetland ecosystems, exacerbating environmental degradation despite national policies aimed at balancing growth with environmental sustainability through responsible natural resource management. Challenges include wetland encroachment, soil erosion, and biodiversity loss, prompting government initiatives like environmental grants and legal frameworks. In Mbarara City, urban growth has led to wetland loss, land fragmentation, and soil erosion, impacting local flora and fauna, with activities like agriculture and construction driving wetland encroachment despite legal protections. Addressing these issues requires coordinated efforts among governments, communities, and stakeholders to harmonize urban development with environmental conservation for sustainable ecosystem management.

Purpose of the Research Study

The purpose of the study is to examine the effect of urbanization on environmental management in newly created town councils in the Mbarara district.

Leave blank for REC office only: BSU-REC Stamp:	REC OFFICE USE ONLY: APPROVAL DATE: APPROVED CONSENT IRB VERSION NUMBER: PI NAME: IRB NO:
--	--

Why you are being asked to participate?

You have been asked to participate because of the expertise, experience and knowledge that you have towards the variables under investigation.

Risks or discomforts

There are no foreseeable physical risks associated with participating in this study. However, there may be some inconvenience or time commitment involved in maintaining the experimental plots and cooperating with the researchers.

Benefits

Your participation may contribute valuable insights that can benefit the local community members in the district to know the extent of environmental damage and the effect it has had on their social and economic livelihood. The information obtained will be treated confidentially, and your individual identity will be kept anonymous in any reports or publications resulting from this study.

Incentives or rewards for participating

Your participation in this study is entirely voluntary. You may choose not to participate or withdraw from the study at any time without any consequences. Your decision will not affect your relationship with the researchers or any organizations involved.

Data confidentiality

~~Your personal information will be kept confidential, and any data collected will be securely~~

Leave blank for REC office only:

BSU-REC Stamp:

REC OFFICE USE ONLY:

APPROVAL DATE:

APPROVED CONSENT IRB VERSION NUMBER:

PI NAME:

IRB NO:

stored. Only the research team will have access to the data. Results will be presented in a way that does not disclose your identity.

Protecting subject privacy during data collection

Respondents will not be allowed to disclose their personal identities either on recordings or questionnaires as a strategy to protect their privacy. Data collection will be done in a period of one 14 days.

Right to refuse or withdraw

You may choose not to participate or withdraw from the study at any time without any consequences. Your decision will not affect your relationship with the researchers or any organizations involved.

Who do I ask/call if I have questions or a problem?

Chairman BSU-REC - Dr. Godfrey Zaari. Rukundo Chairman, BSU REC

P.O. Box 09 Mbarara Tel: 0772663671

What does your signature or thumbprint on this consent form mean?

Your signature on this form means.

1. You have been informed about the purpose of the study.

Leave blank for REC office only: BSU-REC Stamp:	REC OFFICE USE ONLY: APPROVAL DATE: APPROVED CONSENT IRB VERSION NUMBER: PI NAME: IRB NO:
--	--

2. You have been given a chance to ask questions before you sign.
3. You have voluntarily agreed to be in this study.

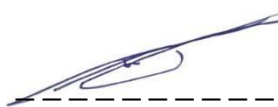
____ Name of adult participant

____ Signature of participant or

____ Date

____ Legally authorized representative

BYARUHANGA ARTHUR

 4/3/2024

____ Name of person obtaining consent

____ Signature

____ Date

____ Name of witness

____ Signature or thumb print or mark

____ Date

Leave blank for REC office only: BSU-REC Stamp:	REC OFFICE USE ONLY: APPROVAL DATE: APPROVED CONSENT IRB VERSION NUMBER: PI NAME: IRB NO:
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APPENDIX XV: OKUSHAABA OKUKWATANISA OMU KUKYONDOZA



BISHOP STUART UNIVERSITY

AKAKIIKO K'EMICWE N'EMITWARIIZE OMU
KUKYONDOZA, AKASHANDUKYE 09 MBARARA-
UGANDA,
ENAMBA Y'ESIIMU: +256 485-433468,
Omukutu gwa kanyabwengye: rec@bsu.ac.ug.

EKIRIKUKYONDOZIBWAHO: ENKURAKURANA YA'MATAWUNI HAMWE NANA
OKUKUMA OBUHANGWA OMU MATAWUNI AGARIKUHWANGWAHO BUSYA
OMURI MBARARARA DISTURIKITI.

Omukyondoza:

BYARUHANGA ARTHUR 22/BSU/MAPAM/1822

Okutandiika

Noshabwa kwejumbira omu kucondoza oku. Okucondoza kukwatsire aha “Enkurakurana

Ya'matawuni Hamwe Nana Okukuma Obuhangwa Omu Matawuni Agarikuhangwaho Busya

Leave blank for REC office only: BSU-REC Stamp:	REC OFFICE USE ONLY: APPROVAL DATE: APPROVED CONSENT IRB VERSION NUMBER: PI NAME: IRB NO:
--	--

Omuri Mbararara Disturikiti” Omugasho mukuulu gw’okucondoza oku nokwenda kumanya ebiiri omu kyagambwaho aharuguru.

Ebiiri Enyiima Y’okukyondoza

Enkurakurana ya’matawuni, omuringo gw’okuhindura emyanya etariimu bantu omu matawuni nenshonga nkuru omunsi yoona. Konka, okukurakurana kwa’matawuni kureteire okuteema ebibiira, okushisha obutuura bya ebindi bintu ebyiine amagara, okukyendera kwa amaizi hamwe nana ebindi kurugirira ahabahandiki (Abd-Elmabod hamwe na abandi, 2019). Abantu baingi nibatekwatekwata kutuura omutawuni gwaza kuuba omwaka gwa 2030, Mbweni okuhangaho amatawuni kukanyire omuri Afurika nana ahandi ahari enkurakurana mpango. Emiringo y’okumaraho ebizibu ebi eri omu bitongore bingi omunsi.

Omu Uganda, okuhangua kw’amatawuni n’okwamani, ekiretsire ebijubu omu kukuma obuhangwa. Entekateka zeihanga aha kukuuma obuhangwa nikyetaga kurinda obuhanwa nana obwegyendesereza.

Omuri Mbarara Disturikiti, Okuhangaho nana okukurakurana kwa’matawuni kireteire okushisha ebisharara, okusharasharamu amaataka, emitunga kandi enyamiswa hamwe n’ebimera. Okukozesa ebishararara omu miringo mibii kiretsirwe obuhingi nana oburiisa, okwombeka kandi byoona nibikanga obuhangwa. Nana obuharebe hariho emiringo y’okukuma ebishararam, okuta omunkoora kikiiri ekiizibu. Mbweni okumaraho ekizibu ekyi nihetage okukwatanisa kuruga omu bakulu omu gavumenti, abebembezi b’ebyaro hamwe na abataaka kwenda kuringaniza okuhangaho nana okukurakurana kwa amatawuni hamwe na

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okukuma obuhangwa.

Enshonga Enkuuru Munoonga Omukukyondoza oku

NInyenda kumanya ebirikuruga omu kuhangaho nana okukurakurana kwa'matawuni aha kukuuma eby'obuhangwa omu matawuni agarikuhangwaho omuri Mbarara Disturikiti.

Ahabwenkyi Noshabwa Okugarukamu?

Okugarukamu kwaawe nikwetengwa munoonga ahabw'okushoma kwonka. Wagarukamu ebibujo noiya kuuba wayamba omukyondoza kucwamu gye aha kukyondoza kwe. Maziima, tiharimu mpera yona, mbwenu noshabwa kuyamba omu kukyondoza oku.

Ebiiri Kukanga hamwe n'okwerarikiriiza Omukukyondoza Oku

Tihariha kizibu kyoona ekirikuteberezibwa kuteganisa okukyondoza oku. Kwonka nihabasa kubamu okuteganisibwa nka omu kukwata obwiire omukutebekanisa omwanya gw'okureramu ekirikurebeka hamwe na okurundana okyondoza.

Ebirungi ebirikutekwatekwa kuruga omu Kukyondoza Oku

Okwejumbira kwaawe omu kucondoza oku n'okwomugasho munoonga ahabwokuba ebirugamu birayamba abantu boona aba omuri Mbarara Disturikiti.

Okusiimwa aha'bwokugarukamu kwaawe:

Okugarukamu kwaawe omu kukyondoza oku nokwabusha. Tihariho kintu kyoona ekitekatekirwe

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kukuhebwa ahabwa okugarukamu. Kandi nobaasa kucwamu obutagarukamu ninga oyemereze okugarukamu kwaawe. Tihariho nshonga yoona omuri ekyo.

Oburinzi bwa ebiriruga omu Kukyondoza Oku:

Ebiri kunganywa byoona omu kukyondoza oku birakumwa gye nana obwerinzi kandi nibyija kukoze sibwa ahabwokushoma kwonka. Bwanyima ya emyaka etaano obwo omukyondoza amazire kuteeka ekibandiko kyirikworeka ebyarugiremu aha mukutu gwa kanyabwengye, ebindi nka obutambi hamwe empapura eziriba zikoze sibwe birayokibwa.

Okushurura ebikwasire aharyogwo Orikugarukamu:

Omutondoza aryaguma namanyisa orikugarukamu weena aha mugasho gw'omukyondoza oku.

Emiringo erikwija kukoze sibwa omu kukyondoza oku:

Ku oracwemu kugarukamu omu kukyondoza oku, noija kushabwa ebi:

- Okugrukamu ebibujo hamwe na okubagana aha bukungu bwaawe.
- Okwejumbira omu kubuzibwa butuunu kubaasa kubagaana obukuugu bwawe omu kuhinga nokuriisa.
- Okuhereza ebyorikumanya aha biika bya ebihimba ebyorikuhinga, ensharura hanwe nana ebizuubu ninga ebirungi ebyotungire.
- Oyiikirize abakyondoza batungye byoona ebyiine akakwate nana okuhinga nokurisa.

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Obugaabe bw'okwanga ninga Kwemereza okugarukamu

Oyiine Obugabe okugarukamu ninga kucwamu kurekyeraho okugarukamu kwawe n'obuwakuba watandikire. Okusharamu kwaawe kwoona tikurigiira buziibu ahari muntu wena oriba nagarukamu.

Ebirikukubaho wabura kugagrukamu?

Nobasa kucwamu obute'jumbira omu kukyondoza oku ninga ocwemu obutagarukamu ninga oyemereeza okugarukamu kwaawe kandi tikiyiine kizibu kyoona ninga akakwate nana omukyondoza.

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Mbuuze Oha/ Teere kuwakuuba oyiiine ekibujo nginga ekiziibu.

Omukyondoza: **Byaruhanga Arthur Tel: 0704437979**

Orikwebembera Okukyondoza aha itendekyero Bishop Stuart Dr. Godfrey Zaari Rukundo,
Akasandukye 09, Mbarara, Enamba y'esiimu : 0772663671

Omukono gwaawe nginga ekinkumu kyaawe nikimanyisaki?

Omukono gwaawe aha baruhu egi niugumanyisa ebi:

- Omanyisibwe aha mugasho gwokukyondoza oku, engyenderwaho, ebirungi ebirikutuekwatekwa kurugamu.
- Ohaibwe chance kubuuja otakateireho omukono gwaawe.
- Washaramu kwejumbira omukukyondoza ahatari mpera.

Eiziina rya

orikugarukamu

Okuziire

Omukono

gw'owamateeka

oyikiirizibwe

Ebiiro

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PI NAME:

IRB NO:

BYARUHANGA ARTHUR



4/3/2024

—

Eiziina ryo'muntuntu orikukyondoza

Omukoono

Ebiiro

Eiziina ry'orikubihamya

Omukono ninga ekinkumu

Ebiiro

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APPENDIX XVI: REC APPROVAL LETTER



Tel: 0772 512551



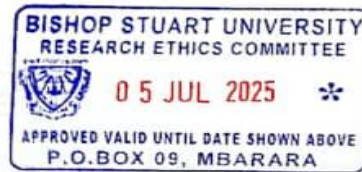
Website: www.bsu.ac.ug
E-mail: rec@bsu.ac.ug/info@bsu.ac.ug

RESEARCH ETHICS COMMITTEE

To: BYARUHANGA ARTHUR

Bishop Stuart University
0704437979

Type: Initial Review



05/07/2024

Re: BSU-REC-2024-371: URBANISATION AND ENVIRONMENTAL MANAGEMENT IN NEWLY CREATED TOWN COUNCILS IN UGANDA. A CASE STUDY OF MBARARA DISTRICT

I am pleased to inform you that at the 28 convened meeting on 13/06/2024, the Bishop Stuart University (BSU) REC meeting voted to approve the above referenced application.
Approval of the research is for the period of 05/07/2024 to 05/07/2025.

As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the REC for re-review and approval **prior** to the activation of the changes.
3. Reports of unanticipated problems involving risks to participants or any new information which could change the risk benefit: ratio must be submitted to the REC.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.
5. Continuing review application must be submitted to the REC **eight weeks** prior to the expiration date of 05/07/2025 in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following is the list of all documents approved in this application by Bishop Stuart University (BSU) REC:



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APPENDIX XVII: ACCEPTANCE LETTER

Telephone:

Office: 20002/21885/21433

Chief Administrative Officer: (Residence) 20003
Deputy Chief Administrative Officer

Our Ref: CR/ 164/2



MBARARA DISTRICT LOCAL GOVERNMENT
CHIEF ADMINISTRATIVE OFFICER'S OFFICE
P.O. BOX 1,
MBARARA UGANDA

Date July 9, 2024

Byaruhanga Arthur
Bishop Stuart University

Dear Sir

ADMISSION FOR RESEARCH

This is to inform you that you have been offered an opportunity to undertake research in this Local Government for a period of **1 Month** with effect from **9th July to 9th August 2024**.

During the period Research, you will be attached to **Mbarara District – Urban Councils** under close supervision of respective **Town Clerks**.

This is therefore, to request you to accord him the necessary information related to his research.

Your attention is drawn to Section j-f of the Ugandan Government Standing Orders and Circular Standing Instruction No. 3 of 2014 relating to Research Placements in the Public Service.

Kagaba Allan Rukira

For: **CHIEF ADMINISTRATIVE OFFICER**

For. CHIEF ADMINISTRATIVE OFFICER
MBARARA DISTRICT LOCAL
GOVERNMENT

Copy to: The Town Clerk –
The Principal Human Resource Officer – **Mbarara District**

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IRB NO: