ASSESSMENT OF THE IMPACT OF URBANIZATION ON ENVIRONMENTAL CONSERVATION MEASURES IN NAMANVE INDUSTRIAL PARK AREA, MUKONO DISTRICT, UGANDA

BY

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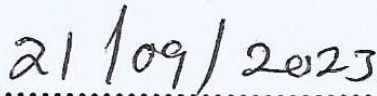
SEPTEMBER, 2023

DECLARATION

I hereby declare that this report is original and has not been published and/ or submitted for any other award to any other academic institution before.

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APPROVAL

This is to certify that this report titled "Assessment of the impact of urbanization on environmental conservation measures in Namanve Industrial park area, Mukono District, Uganda" has been written under my supervision and is now ready for submission.

Signature: 21/9/23

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DR. SUZAN LUYIGA (PhD)

SUPERVISOR

DEDICATION

This research is dedicated to my beloved mother and my uncle who has contributed immeasurably to my studies.

ACKNOWLEDGEMENT

The success in producing this work is attributed to such a number of people, to whom I wish to acknowledge my thanks. The completion of this piece of work has been such a task that would not have been a success when handled solely.

I first of all thank the Almighty Allah, who gave me abundant health, strength, and courage to be able to complete this work. My sincere gratitude goes to my supervisor whose commitment, patience and guidance, gave form to this piece of work.

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I further take recognition of my friends, for their encouragement and support in my academic endeavors.

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ABSTRACT

The study determined the impact of urbanization on environmental conservation measures in the Namanve industrial park area, Mukono District, Uganda. The objectives were to: 1) evaluate the effect of urbanization on the environmental conservation measure, 2) document the environmental conservation practices/measures and 3) suggest mechanisms for the implementation of environmental conservation efforts in the Namanve industrial park area, Mukono District, Uganda. The study utilised a mixed research design in its approach. Hence, data was collected from 296 quantitative respondents and 10 qualitative respondents from the study area. The study discovered that the rate of conservation does not depend on urbanisation. Also, afforestation and reforestation were part of the environmental conservation practices/measures. Second objective findings indicate that continued urbanisation has reduced environmental conservation measures. Thirdly the study indicates that there are some mechanisms put in place for the implementation of environmental conservation efforts in the study area such as air pollution control mechanisms, green environment conservation, the provision of information controls for the environment and the provision of conservation policies. The study concludes that there is ineffectiveness in the environmental conservation practices in Namanve industrial park. Furthermore, it affirms that there is limited environmental conservation practices/measure in Namanve Industrial park. The study concludes that increased urbanisation reduces the environmental conservation measures in Namanve industrial park area, Mukono District, Uganda. The study recommends sustainable environmental practices that will sustain the environmental conservation approaches engaged in the study area.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter presents the background of the study, the statement of the problem, the purpose, the objectives, the research questions, the scope and the significance of the study. It also has operational definitions of key terms.

1.1 Background of the study

The background of the study is presented from four perspectives namely historical, theoretical, conceptual and contextual perspectives.

1.1.1 Historical Perspective

According to Bodo, (2019a) has recounted mentioned the diverse origin of urbanization which has presented a significant negative feature on the environment. However, there seemed to be consensus in the literature that the earliest form of urban life started in the Middle and Near East, in what is called today Iraq around 3,500 BC (Vargo, *et al.*, 2018). In this regard, the oldest urban communities known in history are believed to have started approximately 6,000 years ago (Clark, 1998) and later emerged with the Maya culture in Mexico and the river basins of China and India. In the earlier period of the thirteenth century, the largest cities in the world were the Chinese cites of Chang'an and Hangzhou, which had over one million people. Even the city of London was less than one million until 1700. In the nineteen century, the insufficiency of food supply and the difficulty of the means of transportation necessitated a stable and low population with less than three percent of the world's population living in urban places around 1800 (Clark, 1998). On the other hand, in most developing countries, around 1950, the colonies became independent nations and the quest for development led to the accumulation of resources in core settlements (or areas of interest) that immediately became urbanized through two main factors: massive rural-urban migration and natural increase (Modal, 2018). The urbanization of developing countries, especially in Africa has been described as unique (Bodo, 2015). Urbanization pattern in African is different from that of other continents of the world. As compared with other regions, Africans are always moving to other parts of the world for greener

pastures, leisure and religious functions, but despite this, the continent is one of the fastest urbanizing regions of the world (Fay & Opal, 2017).

Currently, most places in Africa are largely rural and primitive; yet, the African urban population is expected to be more than triple in over forty years, from 395 million in 2000 to 1.339 billion in 2050, corresponding to 21st of the world's projected urban population (UNDESA, 2019). The geographical regions that constitute developing countries are Africa, East Asia, South Asia, Western Asia, Latin America and the Caribbean (Coglianese & Nash, 2012). Prior to1950, urbanization was a phenomenon that was only common to developed countries and these countries experienced rapid urbanization during the period of industrial revolution in Europe and North America in the 19th and early 20th centuries (Vargo, *et al*., 2018). Movements were usually from the rural settlements to the urban centers for better job opportunities. But after 1950, this trend slowed down in the developed countries (Modal, 2019). Currently people are moving from the big cities in developed countries to rural areas; resulting in what is regarded as Counter Urbanization (Modal, 2019). This trend is what gave birth to the growth of suburbs.

In Uganda, despite urbanization being relatively low at 18.2 percent compared to other East African counterparts such as Kenya and Tanzania, the environmental conservation solutions continue to be very low. The roots of urbanization in Uganda go back to the 1890s when the European footprint in the country began to be felt. With the building of the Uganda railway, economic and administrative centres were established, and they have since grown into big towns such as Pakwach, Tororo, and Kasese (Kahangirwe, 2012). Persistent rural poverty that causes migration to urban areas hoping to improve their livelihoods partly explains the urban growth rate. Economic transformation policies have been mainly focused on urban areas (for example on industrialization) so are also partly responsible for urban expansion. The central region has the highest number of people living in urban areas, but the eastern region is the fastest urbanizing region in Uganda (Dixon & McMichael, 2016). Economic growth and political stability over the last two decades have led to the expansion of urban centres, in particular Kampala and the growing of hundreds of small trading centres, particularly along transport route highways and the rail way. Unless environmental dilapidation is arrested, the development of physical infrastructure for the functioning of the economy in cities will not be sustained (Modal, 2019). In

addition, ecological infrastructure will not be achieved. One of the most challenging tasks is guiding the process of urbanization in cities of developing countries (Fay & Opal, 2017).

1.1.2 Theoretical Perspective

The Theory of self-generated urbanization suggests that urbanization occurrence requires two separate conditions, which are the generation of surplus products that sustain people in non-agricultural activities (Hawley, 1981) and the achievement of a level of social development that allows large communities to be capable of working successfully alone (Bodo, 2015; Lampard, 1965). It is believed that this type of change that resulted in urbanization took place simultaneously in the Neolithic period when the first cities emerged in the Middle East (Wheatley, 1971). This theory also holds that rural-urban migration was the source of this form of urbanization, as people began to move to the cities for factory jobs. Thus, industrialization was identified as the driver behind the exodus movement of people from rural settlements to urban areas. This theory concludes that industrialization produces urbanization. This theory has also been queried for focusing on the rural-urban shift within counties as the source of the urbanization, considering that there are other cities that are urbanized based on other factors, and not necessarily through rural-urban migration. Urbanization significantly affects the sectors of the environment (Bodo, 2015).

1.1.3 Conceptual Perspective

Urbanization is a process that leads to the growth of cities due to industrialization and economic development, and that leads to urban- specific changes in specialization, labor division and human behaviours (Breuste, 2004). Urbanization is a process whereby populations move from rural to urban areas, enabling cities and towns to grow. It can also be termed as a progressive increase in the number of people living in towns and cities. It is highly influenced by the notion that cities and towns have achieved better economic, political, and social mileages in compared to rural areas. Canter (1996) contends that Urbanization refers to the population shift from rural to urban areas, the decrease in the proportion of people living in rural areas, and the ways in which societies adapt to this change. It is predominantly the process by which towns and cities are formed and become larger as more people begin living and working in central/urban areas.

Environmental Conservation measures are the practice of preserving the natural world to prevent it from collapsing as a result of human activities, such as unsustainable agriculture, deforestation and burning fossil fuels. Side effects of these practices include toxic air, plastic pollution, destruction of natural habitats and most urgently, climate change (Palen, 2008). Environmental conservation is a practice that paves the way for protecting the environment and natural resources on the individual, organizational as well as governmental levels. There are various core environmental issues that are taking a heavy toll on human lives. These range from overpopulation, hydrological issues, ozone depletion, global warming to deforestation, desertification and pollution. All these issues pose a severe threat to the existence of humankind (Hillman, 2013). Unless environmental conservation is becoming an effective mass movement, it is futile to expect positive growth, especially in the age of digital media which holds the potential to bring a revolution to save our planet from destruction (Palen, 2008).

1.1.4 Conceptual Perspective

In order to analyze the operations in Uganda's industrial parks, we adopted the three-stage framework advanced by Yanga *et al.*, 2018). The three stages are: a) the promotion of business: b) facilitation of production, and c) the enhancement of economic returns. These stages are optimally observed in a successive and highly correlated pattern. The first stage (promotion of business) entails marketing and branding the park to create a corporate image to attract firms and innovators. The second stage (facilitation of production) involves shaping forward and backward linkages, enhancing business support, developing entrepreneurship, and creating opportunities for improving labour skills within the park. The third and last stage (economic returns) entails the creation of fiscal sustainability so that the parks pay their own operating costs as well as rewarding investors (in the parks and the firms) (Modal, 2019). Industrial growth has started to affect the entire environment with its severe downside problems. The formation of massive pollution making industries is the result of the constant need and greed of the human being. These industries include, transportation and manufacturing, which are exhausting the earth's resources, but also causing tremendous stress on the environment and ecological system. The productiveness of industries generally depends on the natural resources available.

Namanve industrial park is among the areas that have existed for a long time with environmental depletions, deforestations and general environmental spoilage being highly existing in the country. The state of environmental conservation is generally low among the existence stances of the parks in Uganda (Simandan, 2018). The occurrence of industrial limitations indicates that there are environmental limitations occurring amongst the people in the environment of Namanve industrial park, Kampala.

In June 2019 the Uganda Investment Authority (UIA) developed a National Industrial and Business Parks Development Strategy that outlines "criteria for locating of industrial parks" stating that they "should be located across the country on suitable land in or near urban centres such as Towns, Municipalities or Cities as specified in the Local Government Act (Simandan, 2018). The criteria provided do not however provide modalities of how the environment will be managed in any community. The environmental conservation measures are generally insignificant in assessing the state of urbanization generally in affecting environmental conservation.

1.2 Statement of the Problem

Countries and states are involved in the establishment of environmental conservation measures aimed at enhancing environmental management in communities and different environments. The state of environmental management in the communities including the urban areas continues to be low (Simandan, 2018). In Uganda, environmental conservation measures are significant in inducing environmental management in the country. However, deforestation, burning fossil fuels, environmental resources depletion and low environmental sustainability significantly exist among the communities, the environmental conservation in the urban areas remain low/ poor (Mugyenyi, Mugeere and Amumpiire, 2020). Namanve industrial park has not however embraced significant environmental conservation especially tree planting and coverage which is lacking, the state of environmental conservation in the areas appears to be low, and urbanization in the area may explain the high existence of environmental disturbances. United Nations recently projected that nearly all global population growth from 2017 to 2030 will be absorbed by cities, with about 1.1 billion new urbanites over the next 13 years (Kaggwa and Namanya, 2018). The existence of urbanization distorts the environment and the total eco-system necessary that holds the environment. Without the environmental conservation measures in places the

environment is highly affected. There exists little documented information on effect of urbanisation on environment in the Namanve industrial park. It on this basin that, that this study on the impact of urbanisation on environmental conservation measures in undertaken in Namanve industrial park area, Mukono district, Uganda.

1.3 Objectives of the study

1.3.1 General Objectives of the study

To determine the impact of urbanization on environmental conservation measures in the Namanve industrial park, Mukono district, Uganda.

1.3.2 Specific Objectives of the study

1. To evaluate the effect of urbanization on the environmental conservation measures in the Namanve industrial park area, Mukono district, Uganda.

2. To document the environmental conservation measures in the Namanve industrial park area, Mukono district, Uganda

3. To suggest mechanisms for the implementation of environmental conservation efforts in the Namanve industrial park area, Mukono district, Uganda.

1.4 Research Questions

1.4.1 General Research Questions

How does industrialisation affect environment and how can such challenges be managed in Namanve industrial park area, Mukono district, Uganda?

1.4.2 Specific Research Questions

1. How does urbanization affect the environmental conservation measures in the Namanve industrial park area, Mukono district, Uganda?

2. What environmental conservation measures are implemented in the Namanve industrial park area Mukono district, Uganda?

3. What possible environmental conservation mechanisms can be implemented in Namanve industrial park area, Mukono district, Uganda?

1.5 Scope of the study

1.5.1 Geographical Scope

The study was conducted in Namanve Industrial Park Area, the largest industrial park in Uganda, sitting on 2,209 acres (894ha/8.9 sq km) of land. It is located 0°21'27.0″N, 32°41'39.0″E (Latitude: 0.357500; Longitude: 32.694167). The park along Kampala Jinja highway is currently home to over 1000 businesses mainly in production and storage. Namanve lies in Bweyogerere Ward, on the southeastern side of Kira Municipality, in Wakiso District. It is located approximately 15 km, east of Kampala city. Namanve is bordered by Seeta in Mukono to the east, Namilyango to the southeast, Lake Victoria to the south, Kirinnya to the southwest and Bweyogerere to the west and northwest. Some parts of Namanve are found within the boundaries of Mukono Town Council.

1.5.2 Content Scope

The study determines the impact of urbanization on environmental conservation in the Namanve industrial park area, Mukono district, Uganda. It specifically to evaluate the effect of urbanization on environmental conservation, secondly to document the environmental conservation measures in the Namanve industrial park area; and thirdly to suggest possible mechanisms for the implementation of environmental conservation efforts in the Namanve industrial park area, Mukono district, Uganda.

1.5.3 Time Scope

The study took a period of 10 months from January to October, 2022.

1.6 Significance of the study

The study examined the rationale for ensuring environmental conservation in and around the Namanve industrial park. Thereby, the beneficiaries of the study included the industrial park, the Uganda investment authority and the Mukono community. The findings further might be useful to organizations responsible for conserving the environment and resources in the country. The

study may provide avenues necessary in ensuring the development of environmental sustainability approaches in the study area. The study in additional might add to the already existing source of information about the impact of urbanization on the conservation of the environment in the Ugandan context.

1.7 Operational definition of key terms

Urbanisation: Urbanization is the population shift from rural to urban areas, the corresponding decrease in the proportion of people living in rural areas, and the ways in which societies adapt to this change. It can also mean population growth in urban areas instead of rural ones. It is predominantly the process by which towns and cities are formed and become larger as more people begin living and working in central areas (MeSH, 2016).

Environmental conservation: Environmental conservation is the practice of protecting the natural environment by individuals, groups and governments. Its objectives are to conserve natural resources and the existing natural environment and, where it is possible, to repair damage and reverse trends (The Law Dictionary, 2012).

Industrial park: An industrial park is a portion of a city that is zoned for industrial use rather than residential or commercial needs. Industrial parks may contain oil refineries, ports, warehouses, distribution centers, and factories (www.investopedia.com).

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents a critical analysis of previous scholarly works related to the variables under study. The chapter begins with a theoretical review followed by the empirical review and lastly the research gaps. Literature sources include journal articles, research publications, human resource management text books and articles.

2.1 Theoretical Review

This study was underpinned on three theories that the Self-Generated Urbanization theory, modernisation theory and the dependency theory.

Self-Generated Urbanization theory

As discussed earlier in the introduction section, the Theory of Self-Generated Urbanization supports the concept that industrialization produces urbanization.

This theory suggest that urbanisation occurrence requires two separate conditions, which are the generation of surplus products that sustain people in non-agricultural activities (Hawley, 1981) and the achievement of a level of social development that allows large communities to be capable of working successfully alone (Bodo, 2015; Lampard, 1965). It is believed that this type of changes that result in urbanisation took place simultaneously in the Neolithic period when the first cities emerged in the Middle East (Wheatley, 1971). This theory also holds that rural-urban migration was the source of this form of urbanisation, as people began to move to the cities for factory jobs (Childe, 1950). Thus, industrialisation was identified as the driver behind the exodus movement of people from the rural settlements to urban areas. Before the industrial revolution in Great Britain in the twentieth century, historical evidence showed that no society could be described as urbanised. It was after this period that the West began to industrialise rapidly and soon after the accelerated industrialisation and then urbanisation in the rest of the world through the last century to the present. This theory concludes that industrialisation produces urbanisation. This theory has also been queried for focussing on rural-urban shift within counties as the source of the urbanisation, considering that there are other

cities that are urbanized based on other factors, and not necessarily through rural-urban migration (Davis, 1972; Pred, 1977).

The self-generated or endogenous urbanization theory suggests that urbanization is predicated on two separate prerequisites − the generation of surplus products that sustain people in non-agricultural actives and the achievement of a level of social development that allows large communities to be socially viable and stable. In a demographic sense, this theory focuses on the rural-urban population shift as the foundation of urbanization but it identifies industrialization as the basic driver behind the movement of rural population to urban areas for factory or industrial jobs. The historical development of urbanization is evidential of this theory in that most western countries first undertook accelerated industrialization and then urbanization followed. In view of this, if we focus on cities instead of urbanization, this theory accounts for the endogenous conditions that facilitated the transition from pre-industrial to industrial cities, first in the West and then in the rest of the world, in an uneven manner. A point to note here is that the trends of urbanization in cities today has not necessarily been industrialization-driven or accompanied by industrial expansion. Critical voices argue that urbanization today is demographic driven rather than economic because it has not propelled by radical transformations in agricultural productivity and industrialization (Songsore, 2009). Inspite of this concerns the self-generated or endogenous theoretical perspective of urbanization, perhaps, remains relevant today in light of the close relationship between industrialization and urbanization even in contemporary developing economies, however, the theory suffers from the drawback of focusing narrowly on the rural-urban shift within countries as the key to urbanization (Peng et al., 2011).

Modernization Theory

This theory was prevalent and influential from the 1950s the 1970s. The theory asserts that urbanization results from the introduction of new things and innovations within the society through industrialisation, technological application, information penetration and cultural diffusion (Smith, 1996). Considering urbanisation through the lens of modernization, first, it is common to see elements of modernisation (new things) in every society that has moved from the primitive era (Stone Age) to a new or modern pattern of doing things. Secondly, the importance of technology in social organisation and shaping of the society is very obvious; as

urbanisation usually results afterwards. The present state of urbanisation and development in the world today cannot be separated from its initial state at the onset of modernization (Kasarda and Crenshaw, 1991). Most developments are products of technologically driven societies, which could boost or increase economic capabilities, provide surplus food through improve agricultural system and the use of mechanical and electronic tools or machines to reduce workload on citizen; yet increasing speed and efficiency of work done (Lenski and Nolan, 1984; Nolan and Lenski, 1985).

It is assumed in this context that technology is more important than social organisation of the society. Thus, the application of technology is seen as the main driving force of urbanisation in the society. According to Kasarda and Crenshaw (1991); industrialisation rather than capitalisation is often seen by scholars in this tradition as having major impact in the transformation of the third world societies. Previous scholars have asserted that the modernization approach encourages cultural diffusion and breeds uneven development especially in the third world countries (Hawley, 1981; Kasarda and Crenshaw, 1991). It is believed that this kind of urbanisation may have been triggered by the concentration of social amenities and developmental projects in certain parts of the society, due to ethnic, racial or religious divisions and corrupt politics, that has created economic dichotomy and uneven developments in the world today (Alonso, 1980). With investments and opportunities concentrated in few places (most likely cities); massive rural-to-urban migration is necessitated stemming from rural-push and urban-pull factors (Berliner, 1977; Kasarda and Crenshaw, 1991).

Dependency/World-System

Theory There had been several theoretical statements as regard dependency/world-system theory, making it difficult to harmonize these ideas into a single thought (Kasarda and Crenshaw, 1991; Frank, 1967; Baran 1957; Evans, 1979; Timberlake, 1985, 1987). This perspective of urbanisation emerged from the failure of modernization theory to account for both the conditions and consequences of urbanisation in developing countries (Bodo, 2015). The theorists in this tradition believe that, this kind of system is introduce through either intentional coercion or through the inherent logic of capitalism in certain areas; and also the presence of underdevelopment among the population (Wallerstein, 1980; Galtung, 1971). A more critical analysis of dependency/world-system theory had been reviewed at a more basic

level, whose views were rested on three assumptions (Kasarda and Crenshaw, 1991; Hermassi, 1978; Chirot and Hall, 1982).

Firstly, these critical theorists believed that a unique form of capitalist development pattern exist in societies, attributing it to a form of social organisation. Secondly, for capitalism to be in place, certain social structure will manifest in the form of unequal exchange, uneven development, individual social inequality, core-periphery hierarchies and dominance structures (Kasarda and Crenshaw, 1991). Perhaps, these features of underdevelopment were not available in such societies; the dependency/world-system theorists asserted that a capitalistic development will necessitate such scenario or create them into the system (Hermassi, 1978; Kasarda and Crenshaw, 1991).

The views of these theorists were clear, that the social changes in the third world were as a result of structures and processes of the capitalist world system. Thus, this system thrive through the unequal structure and disproportionate development in the society; as the world cities of the developed world are using primate capitals of the third world as accumulators and transmitters of wealth (Portes and Benton, 1984; London, 1987; Bornschier, 1981; Cohen, 1981).

Individually, each of the four theories reviewed here, selective as it is, offers a distinctive perspective on urbanization during different times that were conducive to the gestation and evolution of each theory. To a large extent, each theory has transcended these times in either sustaining or losing its applicability to countries (cases) that have experienced urbanization differently. While the so-called theory on self-generated or endogenous urbanization uncovered its important general conditions, it does little to account for the recent urbanization of developing countries. Besides failing on the same score, modernization theory does not stress class relations or capitalism per se, but rather the inevitable tensions created by the shifts in social organization encouraged by industrialism (Kasarda and Crenshaw, 1991). Dependency/world-system theory is stronger in suggesting the association rather than proving a causal relationship between urbanization and capitalist development. It may also fall short in explaining the large scope and powerful ways of the state in creating and sustaining rapid urbanization in the context of China and the rise of Shanghai as a new global city (see Chen, 2009). Scholars like John Friedmann

and Saskia Sassen have alerted students of the city to see and appreciate the real impact of global forces on the city. Armed with this global perspective, we should be in a stronger position to examine and understand how the global forces play out in the specific context of a city. One major weakness of the global city perspective may be that its theorizing and analysis are based primarily on a few dominant and heavily studied cities in Western industrialized countries (Orum and Chen, 2003).

Hence the study adopts the conceptual framework below to link the theory with the experimental and practical aspects of the study.

2.2 Conceptual Framework

Independent Variable   **Dependent Variable**

Urbanization   **Environmental Conservation Measures**

- Industrialization

- Population growth

- Urban areas creation leading

  to:

  - Pollution

  - Erosion

  - Noise

  - Siltation

  - Deforestation

  - Wetland reclamation

  - Loss of cover

- Improved environment management

- Livelihoods and environmental sustainability

Moderating Variables

- Afforestation

- Reforestation

- Wetlands rehabilitation

- Waste management

- Wetland restoration

- Awareness raising

- Policy implementation

- Law enforcement

- Use of mitigation technologies

Figure 2.1: Showing the conceptual framework

Source: Researcher Self-generated, 2022.

The framework shows the independent and dependent variables. The independent variable is urbanization which is measured in terms of industrialization, population growth, urban areas creation leading to: pollution, erosion, noise, siltation, deforestation, wetland reclamation and loss of cover, however on the other hand the dependent variable which is environmental conservation measures was measured in terms of improved environment management and livelihoods and environmental sustainability. Thus there were also moderating variables which were measured in terms of afforestation, reforestation, wetlands rehabilitation, waste management, wetland restoration, awareness raising, policy implementation, law enforcement and use of mitigation technologies. The framework assumes that the presence of urbanization limits environmental conservation measures while improving environmental conservation in an urban area enhances urban development.

2.3 Effect of urbanization on environmental conservation measures

Urbanization is very common in developing and developed worlds as more and more people have the tendency of moving closer to towns and cities to acquire "privileged" social and economic services as well as benefits. These include social and economic advantages such as better education, health care, sanitation, housing, business opportunities, and transportation. Urbanization refers to the population shift from rural to urban areas, the decrease in the proportion of people living in rural areas, and the ways in which societies adapt to this change. It is predominantly the process by which towns and cities are formed and become larger as more people begin living and working in central areas.

The process of urbanization affects all sizes of settlements, so villages gradually grow to become small towns, smaller towns become larger towns, and large towns become cities. This trend has led to the growth of mega-cities. It is possible that in some localities, residents may not need to relocate or migrate to nearby cities for greener pastures, but may see the opportunities they desire, come to them; as some rural settlements metamorphosed into urban settlements (Bodo, 2019a).

The biggest influence on urbanization today is the government policies and programs that are available in individual countries of the world. Nigeria for instance has a system that focuses development in the capital cities alone, with every government that comes into power focusing

on transforming and adding more colours to the already built city where the seat of power is located. The Niger Delta people of Nigeria had over the years complained that the resources generated from the region have been used to build up Lagos and Abuja (former and present nation's capital cities) into mega cities, at their own detriment (Bodo, 2019b; Bodo & David, 2018). The 36 state capitals in Nigeria have been the only areas of infrastructural development and creation of employment opportunities; thereby creating permanent poverty and suffering in the town and villages surrounding these capital cities (Bodo, 2019a).

A typical example of the conscious efforts of the government to kill off the self-surviving town is the case of some towns in Rivers State in Nigeria. In the late 80sand 90s, there were popular towns like Bori, Isiokpo, Abonnema, Buguma, Ahoada, and others that were known for commercial activities, but the State Government overtime focused on development (security, social amenities, health and educational facilities) in Port Harcourt metropolis (Port Harcourt and Obio-Akpor Local Government Areas); these once beautiful towns have been deserted and are now reverted to rural settlements (Bodo, 2019a).

Although people are pulled towards the advantages of cities, the impacts of urbanization are mixed. First, we will look at the many positive impacts of urbanization before going on to describe some of the challenges created by rapid unplanned urban growth. Thriving towns and cities are an essential element of a prosperous national economy. The gathering of economic and human resources in one place stimulates innovation and development in business, science, technology and industry. Access to education, health, social services and cultural activities is more readily available to people in cities than in villages. In cities, child survival rates are better than in rural areas because of better access to health care (Vargo, Habeeb and Stone, 2018). The density of urban populations makes it easier and less costly for the government and utilities to provide essential goods and services. A variety of educational courses are available, offering students a wide choice for their future careers (UN-Habitat, 2016).

However, these many benefits of urban life do not apply to all. Rapid population increases and unplanned growth create an urban sprawl with negative economic, social, and environmental consequences. In Ethiopia, the rate of urban growth often strains the capacity of the local and

national government to provide urban residents with even the most basic services of housing, water supply, sewerage and solid waste disposal (MWUD, 2008).

Housing: In developing countries, about a third of urban inhabitants live in impoverished slums and squatter settlements (UN-Habitat, 2012). Slums are urban areas that are heavily populated and have sub-standard housing with very poor living conditions, creating several problems. In Addis Ababa, a report in 2008 found that 80% of the houses in the city were classed as slums due to the physical deterioration of its housing, overcrowding, high density, poor access and lack of infrastructure services (Reusswig, 2018)

Slum areas typically suffer from poor housing with small, overcrowded houses built very close together using inadequate materials and with uncertain electricity supply, restricted access to water supplies, little or no sanitation/latrine facilities and no solid waste disposal, which leads to a polluted and degraded local environment, inadequate health care facilities which, coupled with the poor living conditions, increases sickness and death rates, insecure living conditions slum dwellers may be forcibly removed by landowners or other authorities (Suparb & RanjithPerera, 2018).Many low-income families gravitate to these informal settlements that proliferate in and around towns. Poverty is one of the most critical issues facing urban areas. Urban poverty degrades both the physical and social environment. In developing countries, about a third of urban inhabitants live in impoverished slums and squatter settlements (UNCHS, 1982).

Poverty, Poor Sanitation, Health and Spread of Diseases: When people move in their numbers to a particular location, there will be pressure on food supplies and food distribution in such areas. In rural areas in developing countries, the majority of the residents are subsistence farmers who have no food challenges, but rather usually have food in excess for market supply (Tamale, 2016). However, as people continue to migrate from their villages (place of origin) to the cities, they tend to use purchased food instead of their own crops and this makes them more vulnerable to changes in food prices. When they cannot afford the cost of food in the city, they settle on rotten or expired food for survival and then to a total lack of food supply; and finally in abject poverty and misery in the city. A situation that defeats their expectation of a better life, resulting in what could be termed as "suffering in paradise (Nyakaana & Sengendo, 2014).

Water supply and sanitation: The provision of water and sanitation services to growing urban settlements, a peri-urban and slum area presents critical challenges. The increased demand for water from the growing population can place added stress on already stretched resources. In and around cities, water is commonly in short supply and subject to increasing competition by different users. Urban growth leads to increasing demand for water for industrial and domestic use, which conflicts with agricultural demands (Roseland, 2018).It is especially difficult to provide water and sanitation services to deprived areas and the poorest people. Many people in these areas live without access to safe drinking water and proper sanitation.

Even where adequate water supplies are available, sanitation and wastewater disposal are often inadequate or missing. Pit latrines and septic tanks are the usual methods for human waste disposal but they have limited capacity and are not always adequate to cope with the quantity of waste produced by many people living close together. Overflowing latrines and septic tanks contaminate surface water and create a serious health risk. The lack of these essential services threatens not only the health and the environment of people in slum areas but also that of people living in formal urban areas (Wang, Ma and Zhao, 2018).

Wastes and Pollution: Urbanization affects land, water, air and wildlife because of the number of people, the amount of buildings and construction, and the increased demands on resources. It has impacts on the physical environment in several ways. In developing countries, including Ethiopia, many rivers in urban areas are more like open sewers (Saboori & Sulaiman, 2016). The lack of sanitation and sewerage systems has a dramatic impact on urban watercourses. People use the rivers to dispose of all their waste from homes, industries and commercial businesses.

Solid waste: In many towns and cities solid waste management is inefficient or non-existent. Solid waste management means the proper collection, transfer, recycling and disposal of all the solid material we throw away, including plastics, paper and cardboard, food wastes, electrical waste, etc. It also includes industrial, hospital and institutional wastes which often contain pathogens as well as hazardous and toxic chemicals, which need special care. Urban waste often ends up in illegal dumps on streets, open spaces, wastelands, drains or rivers. This is frequently a problem in peri-urban areas, which are convenient for dumping wastes because of the availability of open space and ease of access from central urban areas (Tebajjukira, 2018).

Urbanization affects land, water, air and wildlife because of the number of people, the amount of buildings and the increased demands on the available resources in the cities. The lack of sanitation and sewerage systems has led to the blockage of the drainage system, causing flooding in the city. Toxic wastes from industries are often deposited into rivers. This results in the contamination of rivers which makes the water unsafe for drinking and irrigation, as well as harming the fish. The environment is often contaminated by the emissions from the industries and cars in the cities which affect the health of city residents (Bodo & David, 2018).

Health: Urbanization can have both positive and negative effects on health. The main benefits are associated with easier access to hospitals, clinics and health services in general. If you live close to these services you can reach a doctor in minutes rather than hours or days, so this improves emergency care and general health. There are also benefits from easier access to sources of information such as radio and television which may be used to communicate information about health to the general public. For example, women living in towns and cities are more likely to be informed about family planning, which results in a reduction in family size and less frequent childbirth, with consequent benefits to general health. However, urban life can also damage your health (Li, et al., 2015).

Food: Population movements also put pressure on food supplies and on food distribution. As people migrate to the cities, they tend to use purchased food instead of their own crops and this makes them more vulnerable to changes in food prices. As the population grows and the demand for water and land increases, it becomes difficult to increase food production in a sustainable way (McMichael, 2017).

Economic and social systems: The process of urbanization has positive as well as negative economic and social changes. The positive effects include economic development and education. However, urbanization places stress on existing social services and infrastructure. Crime, prostitution, drug abuse and street children are all negative effects of urbanization. Also, there tends to be a lack of social support for children in school and at home by their hard-working, usually poor, parents. Inadequate income, overcrowded housing and poor living conditions create a fertile ground for the development of violence (Tang, Tang and Lee, 2019).

Traffic Congestion: When more people move to towns and cities, one of the major challenges posed is in the transport system. More people mean an increased number of vehicles which leads to traffic congestion and vehicular pollution. Many people in urban areas drive to work and this creates a severe traffic problem, especially during rush hours. Also as the cities grow in dimension, people will move to shop and access other social needs/wants which often cause traffic congestion and blockage (Stevenson, 2017).

2.4 Environmental conservation Measures

There are several ways we can use to conserve the environment such as De-stocking (reducing the number of livestock). This refers to the process of reducing the number of animals in the environment because when the number of animals increases in the environment, they can feed on all the plants which helps to prevent soil erosion or landslides. Therefore reducing the number of cattle help to conserve the environment since fewer cattle means less grass and plants are destroyed which in turn help to restore areas that were once overgrazed (Coglianese & Nash, 2012).

Afforestation Measures

Forestation refers to the process of planting trees on bare land and replanting trees in the presence of other trees (Su & Ang, 2018). Afforestation helps to conserve the environment by planting trees where there were no trees hence preventing soil erosion and encouraging rainfall formation. For example in some parts of Dodoma Tanzania where there was serious soil erosion afforestation has helped to reduce erosion and stabilize the ecosystem.

Reforestation Measures

Kyeremeh (2015) contend that reforestation is the natural or intentional restocking of existing forests and woodlands that have been depleted, usually through deforestation. Reforestation can be used to improve the quality of human life by soaking up pollution and dust from the air, rebuilding natural habitats and ecosystems, mitigating global warming since forests facilitate bio sequestration of atmospheric carbon dioxide, and harvesting resources, particularly timber(Su & Ang, 2018). Asante (2005) contends that, the term reforestation is similar to afforestation, the process of restoring and recreating areas of woodlands or forests that may have existed long ago

but was deforested or otherwise removed at some point in the past. In this study, reforestation is measured in tree planting, forest maintenance and monitoring of the forests.

Reforestation is the natural or intentional restocking of existing forests and woodlands (forestation) that have been depleted, usually through deforestation but also after clear-cutting. Reforestation is whether or not the succeeding forest will have the same biodiversity as the original forest. If the forest is replaced with only one species of tree and all other vegetation is prevented from growing back, a monoculture forest similar to agricultural crops would be the result. However, most reforestations involve the planting of different selections of seedlings taken from the area, often of multiple species (Goosem & Tucker, 2013). Another important factor is the natural regeneration of a wide variety of plant and animal species that can occur on a clear-cut. In some areas, the suppression of forest fires for hundreds of years has resulted in large single-aged and single-species forest stands. The logging of small clear cuts and/or prescribed burning actually increases the biodiversity in these areas by creating a greater variety of tree stand ages and species (Goosem & Tucker, 2013).

Control industrial gases Measures

Industrial waste is one of the sources of water and soil pollution hence control of this waste can be very useful in conserving the environment. Industrial wastes and gases can be controlled by treating them before dumping them and taxing the industries to raise money which can be used to clean the environment of the industrial wastes (Von, 2015).

Industrial sewage Treatment Measures

Industrial wastewater treatment describes the processes used for treating wastewater that is produced by industries as an undesirable by-product. After treatment, the treated industrial wastewater (or effluent) may be reused or released to a sanitary sewer or to surface water in the environment (Von, 2015). Some industrial facilities generate waste water that can be treated in sewage treatment plants. Most industrial processes, such as petroleum refineries, chemical and petrochemical plants have their own specialized facilities to treat their wastewater so that the pollutant concentrations in the treated waste water comply with the regulations regarding disposal of wastewater into sewers or into rivers, lakes or oceans (Von, 2015). This applies to industries that generate waste water with high concentrations of organic matter (e.g. oil and

grease), toxic pollutants (e.g. heavy metals, volatile organic compounds) or nutrients such as ammonia. Some industries install a pre-treatment system to remove some pollutants (e.g., toxic compounds), and then discharge the partially treated wastewater to the municipal sewer system.

Control of industrial fertilizers

Instead of depending on industrial fertilizer, we can use manure since manure has no effect on the soil while industrial fertilizers add acid to the soil. Fertilizers from farms drain into water bodies and cause eutrophication, therefore, farmers should be encouraged to use farming methods which conserve both the soil and the nearby water bodies (Antoci, Borghesi and Russu, 2016)

Control fishing activities Measures

Regulations regarding fishery management are often established through a mixture of national and international laws. These measures can include bans on fishing, such as minimum catch sizes, what type of fishing gear is allowed, conservation efforts for endangered species, and monitoring and control over the areas in which these activities occur. Countries will also regulate aquaculture practices, that is, aqua farming. This term stands for the cultivation of marine organisms such as fish or plants as a controlled activity under human supervision. Regulating this activity is important for preventing or mitigating potential adverse environmental impacts that might occur if there are no fishery management plans in effect (Goosem & Tucker, 2013).

Control construction Measures

This help to avoid the construction of building on steep slopes because this can accelerate soil erosion.in order to increase the speed of environmental conservation, people should know the importance of environmental conservation and how they can help in the process. Many people destroy the environment simply because they do not know the impact of their actions and sometimes people who wish to be part of the conservation process lack the knowhow of environmental conservation (Di Vita, 2019).

Encouragement of environmentally friendly technology to conserve the environment the government and other stakeholders must encourage and use more environmentally friendly technology such as electric vehicles and solar power. Also in rural areas, electricity and energy-efficient technology should be supplied at reasonable prices to help discourage deforestation (Di Vita, 2019).

Soil conservation

Soil conservation is one of the prominent methods for environmental conservation, the need for soil conservation has arisen to tackle the harmful effects of soil pollution**.** On earth, the soil is the main element that plays a pivotal role in soil erosion, land degradation and floods. Soil is filled with rich nutrients for plant production. Soil conservation can be carried out by ensuring minimal use of fertilizers and venomous chemicals as well as abolishing the disposal of harmful industrial waste in the soil (Antoci, Naimzada and Sodini, 2016).

Waste Management

Especially in developing countries and congested places, on a daily basis, a large amount of waste is thrown away recklessly on the streets and roads. The improper disposal of waste segregation can lead to various dreadful diseases as well as soil pollution (Antoci & Borghesi, 2017). To ensure minimal wastage as well as facilitate waste disposal, we can opt for various techniques like the 3Rs, Reduce, Reuse and Recycle, dry and wet waste segregation, amongst others. With the boom of information technology and the advent of digital media, public awareness pertaining to environmental conservation can potentially yield promising results. There is a dire need to aware the masses of the consequences of environmental pollution and degradation. Further, every individual should be made conscious of how they are polluting the environment and what steps can be taken to implement environmental conservation, be it through using greener energy sources to following the 3Rs of Reduce, Recycle and Reuse (Goosem & Tucker, 2013).

Pollution Control

Pollution control is the process of reducing or eliminating the release of pollutants into the environment. It is regulated by various environmental agencies which establish pollutant discharge limits for air, water, and land. As the increase in temperature is concerning, there is a need to keep a watch on the toxic compounds we ingest that pollute the atmosphere. We need to adopt environmentally sustainable methods to minimize multiple forms of emissions, such as eliminating waste, saving electricity, limiting the unnecessary usage of fertilizers, insecticides and pesticides, and using energy-efficient appliances, among others. Air pollution control strategies can be divided into two categories, the control of particulate emissions and the control of gaseous emissions. There are many kinds of equipment which can be used to reduce particulate emissions. Physical separation of the particulates from the air using settling chambers, cyclone collectors, impingers, wet scrubbers, electrostatic precipitators, and filtration devices, are all processes that are typically employed (Goosem & Tucker, 2013).

Agro-forestry Measures

Agro-forestry is a long-established farming practice in many parts of the world. Broadly defined, agro-forestry refers to a land-use system in which trees are grown simultaneously, sequentially, or in conjunction with annual crops or livestock. The trees are cultivated primarily for agricultural uses, for example, to protect or enrich top soils for the benefit of crops or to provide browse and fodder for livestock (Otsuki, 2010). Although the term "agro-forestry" has been in use since the late l970s, experts still debate over a concise definition of the concept. For example, at least 11 definitions were discussed at the l979 International Cooperation in Agro-forestry Conference sponsored by the International Council for Research in Agro-forestry (ICRAF). The most cited definition of agro-forestry is by ICRAF, which refers to agro-forestry as a collective name for land use systems and technologies where woody perennials such as trees, shrubs, palms, and bamboo are deliberately used on the same land management unit as agricultural crops or animals either in some form of spatial arrangement or temporal sequence.

2.5 Mechanisms for the implementation of environmental conservation measures

Building Sustainable and Environmentally-friendly Cities: Governments should pass laws that plan and provide environmentally sound cities and smart growth techniques, considering that people should not reside in unsafe and polluted areas (Arboleda, 2016). The objective here is to build sustainable cities that embrace improved environmental conditions and safe habitats for all urban populations. Governments should also encourage sustainable use of urban resources and support an economy based on sustainable environments such as investment in green infrastructure, sustainable industries, recycling and environmental campaigns, pollution management, renewable energy, green public transportation, and water recycling and reclamation.

Provision of Essential Services: Urban stakeholders must ensure all populations within the urban areas have access to adequate essential social services namely education, health, sanitation and clean water, technology, electricity, and food. The objective here is to provide and implement employment opportunities and wealth-creation activities so that people can earn a living to pay for the maintenance of the services. Subsidies can also be availed by the government to lower the costs of basic healthcare, basic education, energy, education, public transportation, communication systems and technology.

Creation of More Jobs: To lessen the negative effects of rapid urbanization while at the same time conserving natural ecosystems, private investments should be encouraged so as to utilize natural resources and create more job opportunities (Kahangirwe, 2012). Tourism promotion and the sustainable exploitation of natural resources can create more jobs for urban populations. Subsidies and grants may as well be provided to foreign and private investment in environmentally friendly development projects that encourage job creation. Modal (2019) contends that key stakeholders in urban areas must provide campaigns and counselling for effective medical health clinics and family planning to help reduce the high rates of population growth. Medical health clinics oriented towards family planning options must be made accessible across the entire urban area with the objective of controlling diseases and population growth.

Spread and Even Development Even and spread development is possible, however ethnic and political sentiments has-been the major barrier to national development. Political leaders in developing countries usually start developmental projects running into billions (US dollars) in their home towns (communities of birth) and not necessary where it is needed (Bodo, 2015). If developments were to be planned and distributed fairly to ensure equity in society; the people in every locality will be contented and may not need to migrate in search of food or employment. The backwardness of the rural settlement in Nigeria has been ascribed to a lack of government presence through the provision of basic amenities (Olayiwola and Adeleye, 2005).

Policies That Favours Rural Settlements Policies of government can be seen in the environment. It is true that countries that are regarded as developed, attained such status through effective policy implementation that is geared toward improving the standard of living of its citizens, while the underdeveloped and developing countries either have no policies or have policies that are not effective, as corruptions and gross mismanagement of every available fund is always the end result of every action (Bodo 2019b).

Forest Conservation: Forestation and reforestation help in conserving the forests, which are responsible for absorbing a huge amount of carbon dioxide from searching the atmosphere. We should make it our life mission to plant trees as much as possible. Afforestation is the process of introducing trees and tree seedlings to an area that has previously not been forested. Afforestation can be done through tree planting and seeding, naturally or artificially. Similarly, reforestation can be considered a form of afforestation (Mederly, Bezák and Izakovičová, 2017).

Reforestation is the alteration of a non-forested area to a forested area through tree planting and seeding. Afforestation, reforestation and other forms of conservational forestry methods are often thought to be used for stopping the effects of climate change by reducing atmospheric carbon. The issue is which type of tree sequesters the most amount of carbon and does this have a positive or negative effect if any at all? The tree types that are widely discussed are old growth vs young-growth forests (Bodo, 2019b). Old-growth forests are said to have massive carbon storage capabilities however these trees are capturing carbon incredibly slowly or are unable to

capture any more. With reforestation, this process is 'solved' by cutting down old-growth and planting young-growth trees.

Soil Conservation: It helps control corrosion and improves the soil for agricultural purposes. We should protect pasture lands and grow cover crops which regulate the blowing away of soils. Soil provides the nutrients essential for plant growth, animal life, and millions of microorganisms. However, if the soil becomes unhealthy, unstable, or polluted, the life cycle stops. Soil conservation focuses on keeping soils healthy through a combination of practices and techniques. Individuals committed to soil conservation help ensure that soil is fertile and productive, and protect it from erosion and deterioration (Wustemann, Kalisch and Kolbe, 2017).

Managing Waste: Solid waste is produced by market areas, industries, homes, settlement areas and many other locations. Municipalities should conduct programs that mange solid wastes, designating litter bins all over the towns and collecting the waste regularly. Proper management of waste is important for building sustainable and livable cities, but it remains a challenge for many developing countries and cities (Schene, *et al.,* 2018). A report found that effective waste management is relatively expensive, usually comprising 20%–50% of municipal budgets. Operating this essential municipal service requires integrated systems that are efficient, sustainable, and socially supported. A large portion of waste management practices deals with municipal solid waste (MSW) which is the bulk of the waste that is created by household, industrial, and commercial activity.

Control Pollution: Pollution should be controlled as much as possible. Composing can be adopted. Avoid chemical fertilizers herbicides, pesticides and insecticides that pollute the environment. Improvements in the state of the environment were brought about by direct regulation based on standards for pollution and the environment. Regulations in many areas emission restrictions, emission levels and emission volumes were used to ensure adherence to environmental standards, making it possible to reduce emission volumes at minimal cost (Haase, Frantzeskaki and Elmqvist, 2018).

Create Public Awareness: Make people aware of the consequences of our activities through the various means available such as social media, seminars and traditional media. Everyone should be made aware of the ways to conserve the environment and the potential consequences if we do not take care of the Environment. Environmental awareness is to understand the fragility of our environment and the importance of its protection. Promoting environmental awareness is an easy way to become an environmental steward and participate in creating a brighter future for our children (Albert, *et al*., 2016).

2.6 Research Gap

Although there are various pieces of research conducted about the effect of urbanization on environmental conservation measures, there is a lack of research conducted in academic institutions in 2022 on the same topic, especially in the urban areas of Kampala such as Namanve in 2022, and particularly on the institution under study presenting contextual gaps. Moreover, the studies conducted such of Bodo, 2019a), MWUD, 2008), Reusswig, 2018), Saboori and Sulaiman, 2016), Tebajjukira, 2018 and Bodo and David, 2018) were all conducted outside Uganda; hence, the current research aims at throwing light into these research gaps.

Time Gap. Information in the literature is before 2021, hence the researcher conducted this study in 2023 hence closing the time gap.

Contextual gap. Literature was a named from other countries like USA, German, Kenya other than Somalia. Therefore the researcher intended to close this gap by focusing on Uganda.

Methodological Gap. I used methods of questionnaire, interview and focused group discussion compared to the study of Clayton and Zetterberg, (2018) which was majorly on one method.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents a detailed description of the methodology that the study employed. It mainly looks at the study design, target population, sample size, sampling techniques, data collection instruments, validity and reliability, data analysis and ethical considerations.

3.1 Area and Location

The Government of Uganda, through the Uganda Investment Authority (UIA) is supporting the development of the Kampala Industrial Business Park (KIBP), located at Namanve, to the west of Kampala.

A site visit was made on 2 April 2019, accompanied by personnel from Q&L, Lagan DottJVwho are the appointed construction contractor, and a representative from the UIA. The representative from the UIA confirmed that flooding has been experienced on the proposed KIBP site, particularly along the Namanve River where the culverts are located. Effluent discharge can also make up a significant portion of the flow through the site. It was confirmed that illegal sand mining operations were occurring in particular areas of the site. The proposed Scheme site stretches approximately four kilometres from west to east and about eight kilometres from north to south and sits around 1,143 meters above sea level. The general slope is southwards within the Lake Victoria drainage basin. The site lies within a basin on the edge of Lake Victoria, surrounded by higher areas of ground to the north, east and west (around 180m higher). The Namanve River runs through the KIBP site for around 5km, before discharging into wetlands, which eventually flow into Lake Victoria south of the Kampala Industrial and Business Park (KIBP) site.

The Namanve catchment area has been estimated 2170.28 hectares, as the area of wetlands, also depicted. The district boundary between Mukono (east) and Wakiso (west), which runs through the centre of the site (dashed black line), follows the course of the Namanve River. The Kampala Industrial and Business Park lies towards the north of the catchment area, which reduces the amount of catchment area contributing to flow through the site. A fast runoff response is

therefore likely to occur. Existing under-designed drainage structures act as pinch points on the route to the discharge point in Lake Victoria.

Figure 3.1: Showing Map of Industrial Park
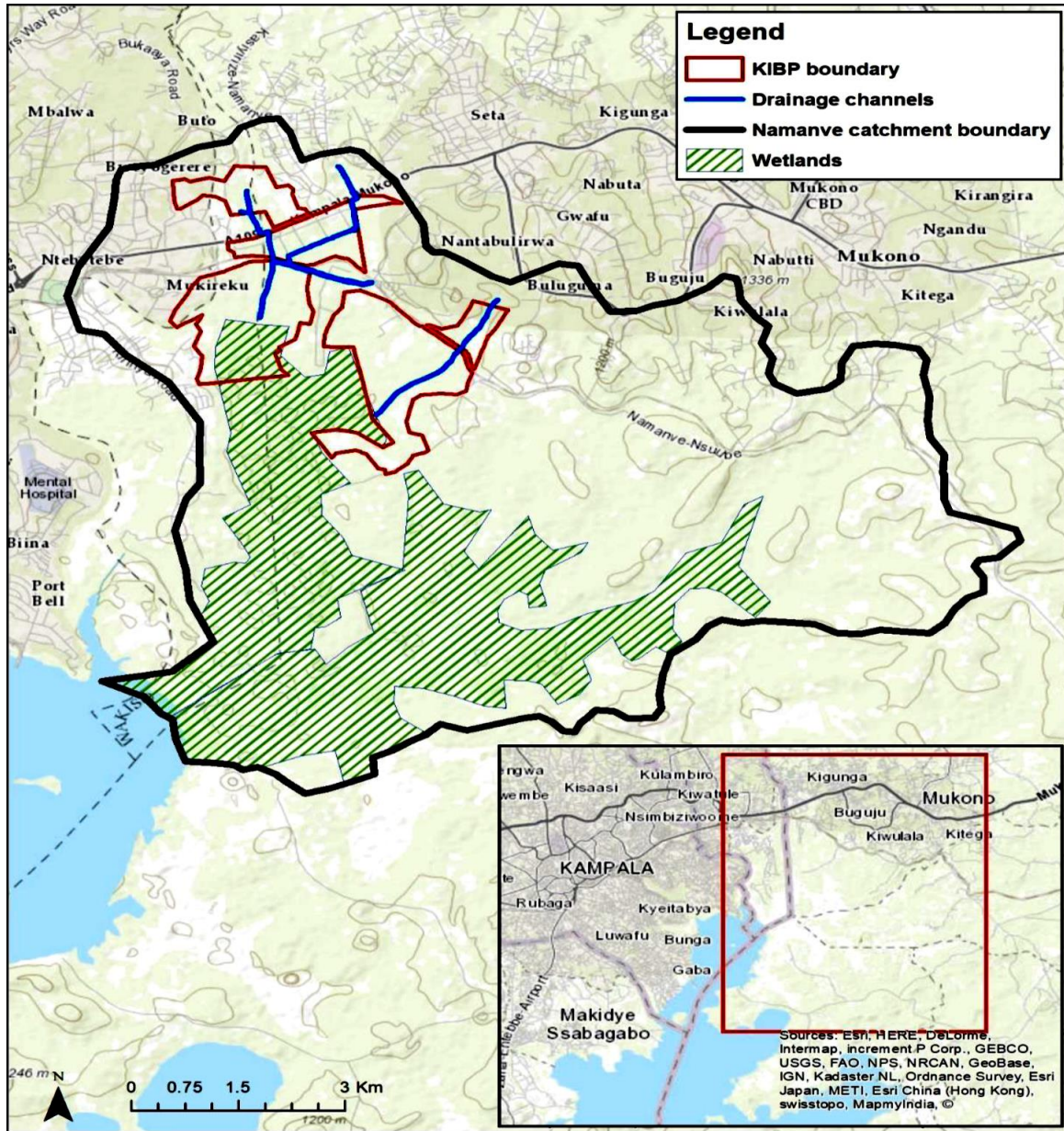
3.2 Hydrological background

The KIBP falls within the Lake Victoria water management sub-basin, which is the largest sub basin unit within Uganda. The KIBP area borders Lake Victoria which is the country's largest lake and is recharged mostly during the two main wet seasons (March to May and September to

December). The water level in Lake Victoria has shown a significant downward trend since 1998, culminating in an 80-year low in October 2006 (Since 2006) however, the lake levels have risen back up to average water levels (Ministry of Water and Environment, 2014). There are also a number of sources describing a larger flood event in 1878, where Lake Victoria rose to levels estimated at 0.5-0.7m higher than the peak water level recorded in 1964 (Gibb, 1984). The Namanve catchment is the largest drainage area discharging into Lake Victoria within Inner Murchison Bay. The Namanve River flows through the KIBP site for around 5km.The catchment area I s 86.7km², with around 25% made up of wetland areas (Uganda Investment Authority, 2004 and EMA Consult Ltd, 2008). During periods of dry weather, the flow from these catchments is typically made up of groundwater springs (Uganda Investment Authority, 2004) and effluent discharges further upstream.

3.2.1 Location

KIBP is located in Namanve, Kira Municipality, Wakiso District. This location is approximately 15 kilometres (9 mi), by road, east of the central business district of Kampala, Uganda's capital and largest city, on the Kampala-Jinja Highway. The coordinates of Kampala Business and Industrial Park are: 0°20'35.0"N, 32°41'55.0"E (Latitude:0.343050; Longitude:32.698600) (Julius, 2014).

3.2.2 Rainfall

The sub-daily data has been compiled for Uganda from the Road Design Manual Volume 2: Drainage Design. The climatic conditions within the proposed development site are strongly influenced by Lake Victoria. Kampala and the surrounding districts receive high rainfall from March to May, and September to December. Relatively drier months are January to February and June to August. The highest rainfall tends to be in April. Annual rainfall is between 1750mm and 2000mm (African Development Group Bank, 2018).

3.2.3 Vegetation

The most likely source of reduced channel efficiency is the growth of vegetation within the channel and the channel sides. Onsite observations have confirmed the existence of thick vegetation within the Namanve River as it flows from north to south through the KIBP. This reduces the volume and flow of water within the channel, thus increasing the water level within the channel and the likelihood of out-of-bank flow and flooding. Provided there are adequate sizing and hydraulic design of channels the growth of vegetation may be accommodated as part of a more natural flood solution

3.2.4 Wetlands and upstream attenuation

It is possible that upstream areas within and immediately outside the KIBP could be set aside for wetlands, in order to compensate for the loss of wetland function elsewhere within the site. The KIBP site would have been almost entirely wetland at one point until the area was drained in the early 20th century (Uganda Investment Authority2004). Surface water flows have a much greater potential to cause damage without the native vegetation to reduce flow and bind the soil. Creating purpose-built wetlands located upstream of and through the KIBP can help to slow the flow of, and attenuate, flood waters. Wetland areas can also provide further benefits by encouraging the deposition of suspended solids before they wash into watercourses and Lake Victoria, improving the water quality. The wetland positioning within the KIBP will be critical to the success of the mitigation measure. It is recommended that wetlands are created directly downstream of the drainage inflows and gullies on the western, northern and eastern edges of the KIBP to have maximum attenuation impact. Measures should be taken upstream of the KIBP if possible, including the inclusion of riparian buffer strips and vegetation planting to stabilize the land and prevent the erosion and deposition of material within the channels. It is recommended to work with local communities to implement these measures.

3.3 Research Design

According to Mugenda & Mugenda (2003), a research design is a framework of methods and techniques chosen by a researcher to combine various components of research in a reasonably logical manner so that the research problem is efficiently handled. The study employed a

descriptive research design, based on both qualitative and quantitative research design. The design is chosen in order to provide an elaborate the state of assessment of the impact of Urbanization on Environmental Conservation Measures in Namanve industrial park, Mukono district, Uganda. It employed the quantitative approach in that it was partly based on variables with numbers and analyzed with statistical procedures. It employed a qualitative approach because it was aimed at obtaining data expressed in non-numerical terms. In particular, it was descriptive design because it was seek to gather data from a sample of a population at a particular time and in so doing, pertinent data was collected from all respondents once and for all to reduce on time and costs involved.

3.4 Study Population

The target population is defined as a collection of elements or objects that possess the information sought by the researcher (Malhotra & Birks, 2006). The study population targeted were the environmentalists, industrialists and local community members are of a total population of 2,518 (KIBS, 2022). The target population was the employees since they were part of the municipality, and had an understanding of the study area.

3.5 Sample Population

According to Yamane (1967) to determine the number of elements to be selected from each stratum the researcher can use a simplified formula for the calculation of sample size suggested that for a 95% confidence level and e=0.05, with a population of 2,518, the size of the sample representatives, 107 respondents are targeted for this research based on the formula:

$$n = \frac{N}{1+N[e]^2}$$

N=Number of population

n= sample

e=standard error at 95% confidence level

The sample population is 345 respondents.

Table 3.1: Population and Sample size

Category	Population	Sample
Environmentalists	025	4
Industrialists	120	16
Community Members	2,373	325
Total	**2,518**	**345**

Source: Primary Data, 2023

3.6 Sampling Technique

The stratified sampling technique was used to represent the characteristic of the targeted population so that the researcher can draw a general conclusion about the entire population (Amin, 2006). A stratified sampling technique was used in this research and it is one of the probability sampling techniques. The used probability sampling technique is because there is a defined sampling frame for this research. Therefore, the probability of inclusion for every member of the population was determinable. As it was stated in the scope of the study, clerical, on-clerical, junior and apprentices were not included in the study.

3.7 Data Collection Instruments

3.7.1 Questionnaire

A five-point Likert scale structured questions were used to collect the primary data. Hard copies of the questionnaires were passed personally to the target respondents while soft copies of the questionnaires were sent through e-mails to the target respondents in an effort to obtain their responses (Saunders, 2005). The designed instrumental questions include two main parts. Part one aimed at collecting demographic characteristics and profile information of the respondents and part two is closed-ended and aimed to collect independent and dependent variables which consist of questions which were intended to measure the perceptions. The scale of measurement used for the study interval included nominal and ordinal stales (Kothari, 2004). An interval scale of measurement was based on the ordered interval that was of equal length and zero value is arbitrary, the nominal scale of measurement was applied for categorical data and the ordinal

scale of measurement was used based on categorical data that involve rankings and ordered values.

3.7.2 Interview Guide

The researcher used an interview guide in data collection. The questions for the interview were both open-ended and closed-ended. The open-ended questions will give chance for more discussions, while the closed-ended questions were asked for particular responses. The interview guide helped in collecting information from industrialists and environmentalists.

3.8 Validity and Reliability

3.8.1 Validity Test

Validity refers to the extent to which data accurately reflects what they are meant to reflect. It means that the instrument measures what it is supposed to measure. Thus, the effect of incentive scheme measurements was adopted from various scholarly works. Items in the questionnaire were prepared using a five point-Likert scale except for the demographic items and additional comments related to the study. Maximum effort was e exerted to create the logical link between the items in the questionnaire and the objective of the study. The researcher will directly contact the staff of the company to collect primary data and he also had a chance to assess all appropriate sources of information that makes the data obtained valid. The researcher used the following formula to establish the validity of the research instruments as seen below.

$$\text{Content Validity Index (CVI)} \quad = \text{CVI} = \frac{No.\,of\,questions\,declared\,valid}{total\,No.\,of\,questions\,in\,the\,questionnaire}$$

$$= \quad \frac{33}{36}$$

$$= \quad 0.91$$

The criterion is that; if the overall Content Validity Index (CVI) of the instrument is equal to the average acceptable Index of 0.7 or above, then the instrument is accepted as valid (Amin, 2005). Since the CVI acquired is 0.9 and an above 0.7, therefore, this implies that the questionnaires were valid.

3.8.2 Reliability Test

A reliability test was conducted to ascertain the reliability level of the research. The reliability of a measure indicates the extent to which the measure is without bias and offers consistent measurement across time (Sekaran, 2003). Cronbach's alpha is a reliability coefficient that indicated how well the items are positively correlated to another. The closer Cronbach's alpha is to 1, the higher internal consistency reliability (Sekaran, 2003). Classification on quality of Cronbach's Alpha value by Stevens (2013) states that a value exceeding 0.9 is excellent, between 0.9 and 0.8 is good, 0.7 to 0.8 is acceptable, 0.6 to 0.7 is questionable and 0.5 to 0.6 is poor, and below 0.5 as unacceptable. The Cronbach's results should be between 0.75 and 0.8 respectively to be interpreted as acceptable (Stevens, 2013).

Table 3.2. Showing the Reliability of the Instrument

No.	Coefficient of Cronbach's alpha	Reliability level
1.	0.9	Excellent
2.	0.9 -0.8	Good
3.	0.7 - 0.8	Acceptable
4.	0.6-0.7	Questionable
5.	0.5- 0.6	Poor
6.	< 0.5	Unacceptable

To ensure the reliability of the instrument, the researcher used the test-retest method. The questionnaire was given to 15 people and after two weeks, the same questionnaire was given to the same people and the Cronbatch Alpha was computed using SPSS. The minimum Cronbatch Alpha coefficient of 0.75 was used to declare an instrument reliable.

3.9 Method of Data Analysis

Data collected from the respondents was entered into a computer and analyzed with the use of statistical packages for social scientists (SPSS) Version: 22, which assisted to summarize the coded data and expedited data analysis. Data collected from the questionnaires were carefully analyzed, summarized and interpreted by using both descriptive and inferential statistics. The

descriptive statistics include frequencies and valid percentages to measure the levels of prevalence of urbanization on environmental conservation measures. Data through inferential statistics were analysed in form of t-test. Tests to test the association between urbanization and environmental conservation measures. The coded data was entered into the Computer, checked and statistically analyzed using the Statistical Package for Social Scientists (SPSS) software package to generate descriptive statistics. Descriptive analysis was applied to describe the primary variable and associated indicator items related to the study objectives. The results for the study presented inform of tables then discussed in relation to existing literature. The presentations were done using frequency and percentages and then personal analysis according to the questionnaire presentations.

Data Collected from the interview guide was manually coded on the transcripts to identify the significant statements across individual interviews. Subsequent readings of the significant statements helped in identifying sub-themes emerging within the patterns. Subsequent readings of the significant statements helped in identifying sub-themes emerging within the patterns. For presentation of thematic findings, both textural and structural descriptions were used in the results section. Textural descriptions are significant statements used to write what the participants experience. Structural descriptions are the interpretation of the context or setting that influenced participants' experiences. For textural descriptions, the quotes of participants will be given in italics with the respondent to whom that quote belongs marked with type. The structural descriptions as interpreted by the researcher were provided in plain text.

3.10 Ethical Considerations

1) The researcher used data from respondents which are collected through self- administer questionnaire; permission is obtained from employees. To maintain confidentiality, the respondents were informed that the information they provide was confidential and used only for academic purposes.

2) The respondents were informed not to write their names on the questionnaire. The data that was collected is kept confidential and the researcher tried to work on the paper with standard professional ethics.

3) It also had to be clearly and expressly explained to the respondents as to the aim of conducting the study, as well as assuring them that the information that they provide was purely for academic use only.

4) Wherever there is doubt in the research; clarification had to be sought by the researcher from the supervisor.

5) The data obtained in the study was interpreted according to the accepted standard methodology and any elements which will be irrelevant to the interpretation of the data had to be excluded.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

4.0 Introduction

In this chapter, the researcher presents the analyses and the interpretation of the data. The presentation, analysis and interpretation of the data are dependent on the objectives and scope of the study. Hence, the results are presented based on quantitative and qualitative data from the questionnaire and the focus group discussions with respondents. The data obtained quantitatively is presented based on frequency and percentages and simple linear regression while qualitative analysis uses content analysis.

4.1 Response Rate

The study set to obtain data from the sampled 325 respondents from the field. However, data was obtained from only 296 respondents. The study got a response rate of 91% respondents from the questionnaires that were administered to the respondents and 10 (66.7%) responses from the interviews. Therefore with this response rate, there is high confidence that the responses received on the study are reliable. Mugenda (1999) as well as Saunders (2007) suggest that a response rate of 50% is adequate when quantitative data is manually collected. Table 4.1 below presents a breakdown of the response rate of the respondents by their categorization.

Table 4.1: Response Rate

Sample Size	Actual returned	Percentage
325	296	91%
15	10	66.7%

Source: Primary Data, 2022

4.2 Demographic profile of the respondents

Analysis of respondents demographic characteristics (gender, age, level of education, marital status, and time of stay in community) was analysed and presented in table 4.2.

On gender, 65.4% were male, 49.6% female, 30.7% were in 4-49 years; 29.7% in 30-39 year while 16.2% in 20-29 years.

4.2.1 Gender of respondents

Here the researcher was interested in attaining the information about gender of the respondents. The information from the respondents is provided in the table 4.2 below.

Table 4.2: Gender of respondents

Responses	Frequency	Percent
Male	167	56.4
Female	129	43.6
Total	**296**	**100.0**

Source: Field Data, 2022

Findings from Table 4.2 on the gender, male were 167(56.4%) and the female was 129(43.6%). The study results indicate that information was attained from both genders, it sought to identify the gender representation for the respondents in the study, and it indicates that all respondents provided their views irrespective of gender.

4.2.3 Age of respondents

Here the researcher was interested in attaining the information about the age of the respondents. The information attained from the respondents is provided in the table 4.3 below.

Table 4.3: Age of respondents

Responses	Frequency	Percent
20-29 Years	48	16.2
30-39 Years	88	29.7
40-49 Years	91	30.7
50 years above	69	23.3
Total	**296**	**100.0**

Source: Field Data, 2022

Results in table 4.3 further present findings on the age of respondents show that the majority of respondents in the study were between the age of 40-49 who was 91(30.7%) respondents them those of 30-39 years 88(29.7%) respondents, then those of 50 years above were 69(23.3%) and finally those of 20-29 years were 48(16.2%) of the respondents. Results indicate that responses were attained from mature respondents, it's evident enough to argue that information was attained from mature people an indication of data attained from understanding responses, this could contribute to the viability of results on urbanisation and environmental management.

4.2.4 Education of respondents

Here the researcher was interested in attaining the information about the education of the respondents. The information attained from the respondents is provided in the table 4.4 below.

Table 4.4: Education of respondents

Responses	Frequency	Percent
Secondary	59	19.9
Certificate	58	19.6
Diploma	73	24.7
Degree	63	21.3
Total	**296**	**100.0**

Source: Field Data, 2022

Results in Table 4.4 on education shows that diploma holders constituting 73 (24.7%), certificate holders were (19.6%), secondary holders (19.9%), degree holders (21.3%) respondents and (14.55) had post-graduate certificates. The study sought to investigate the age of respondents in order to attain the views of respondents with an age group representation. The data attained indicate that the majority respondents had a reusable education background, they have an adequate understanding of the study and hence have been able to answer the questions for the respondents.

4.2.5 Marital Status of respondents

Here the researcher was interested in attaining the information about the Marital Status of respondents. The information attained from the respondents is provided in the table 4.5 below.

Table 4.5: Marital Status of respondents

Responses	Frequency	Percent
Single	63	21.3
Married	210	70.9
Separated	23	7.8
Total	**296**	**100.0**

Source: Field Data, 2022

On marital status, on married constituted 70.9%, single respondents were 21.3%, divorced were 7.8%. The results indicate that respondents were attained from different marital groups, majorly many were married a sign of respondents indicating that the, mature and could provide mature information.

4.2.6 Time of stay of respondents

Here the researcher was interested in attaining the information about the Time of stay of the respondents. The information attained from the respondents is provided in the table 4.5 below.

Table 4.6: Time of stay of respondents

Responses	Frequency	Percent
1-4 Years	25	8.4
5-9 years	23	7.8
10-14 Years	35	11.8
15 years above	213	72.0
Total	**296**	**100.0**

Source: Field Data, 2022

Time of stay of respondents in community was analysed and the results indicate that majority of respondents had lived in Namanve industrial park for 15 years above 72% respondents, followed by 10-14 years at 11.8% then, 5-9 years at 7.8% and finally, 1-4 years at 8.4%. The research results indicate that the majority of the respondents had been in the study areas for a long, therefore, have an adequate understanding of the study area including the status of urbanisation and environmental conservation issues and the information provided could be relied upon.

4.3 Effect of urbanization on the environmental conservation measures in Namanve industrial park area, Mukono district, Uganda

Research objective one was to evaluate the effect of urbanization on environmental conservation measures in the Namanve industrial park area, Mukono district, Uganda. The results are presented in figure 4.1.

4.3.1 Awareness of the effect of Urbanisation on environmental conservation measures
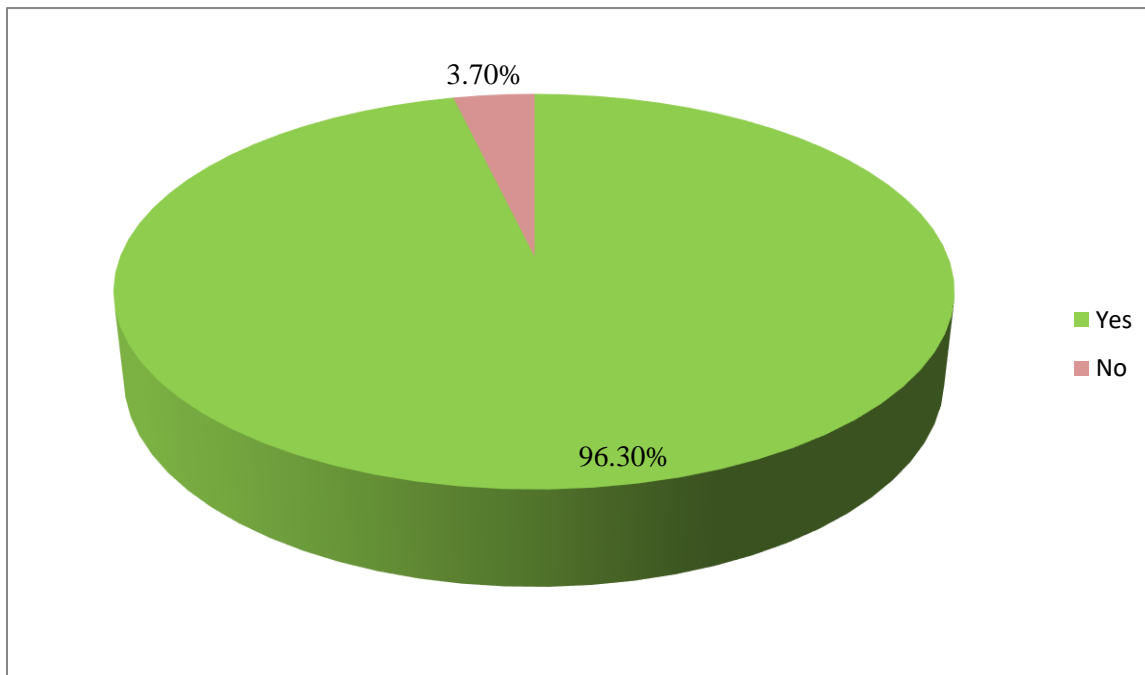
Figure 4.1: showing awareness of the effect of Urbanisation on environmental conservation measures.

Source: Primary Data, 2022

Awareness among respondents on environmental conservation as analysed and the results indicate 96.3% were aware; while 3.7% not aware.

4.3.2 Effect of urbanization on environmental conservation measures

Table 4.7: Effect of urbanization on environmental conservation measures

Responses	Frequency	Percent
Congestion	54	18.2
Environmental Degradation	102	34.5
Burning Fossil fuels	77	26.0
Air pollution	63	21.3
Total	**296**	**100.0**

Source: Primary Data, 2022

Effects of urbanisation on environmental conservation were analysed. Results 34.5% indicate environmental degradation, 36% reported burning fossil fuels, 21.3% stated air pollution, and lastly 18.2% indicated congestion as effect on environment. The study reveals that respondents are aware of the negative impacts of urbanisation are environment in the study area.

One of the key industrial officers interviewed said:

> *"Urbanisation has generally led to the degradation of the environment in the Namanve industrial park. The shrubs and trees have been completely destroyed in the area for the purpose of the industries"*

Another industrial officer stated:

> *"The presence of urbanisation has reduced the eco-system in Namanve area with the plants being destroyed and the animal species being killed into the communities which has presented an ecological danger to the communities around the park".*

Also, an industrial officer reiterated:

> *"Generally, the occurrence of urbanisation in the areas of Mukono has led to congestion, affected water and sanitation and livelihoods have been affected, the communities are living in fear of pollution and its dangers to the communities".*

In addition, the environmental officer said:

> *"The environment has been depleted, some communality have shifted from the area, yet less efforts have been allocated to the improvement of the areas in order to preserve the environmental conditions in place".*

Based on the findings above, there are fairly established environmental control practices undertaken in Mukono district industrial area. In the study, the researcher contends that the practice of urbanisation has an effect on the management of the communities environment situation in Namanve industrial area.

4.3.3 Inferential Analysis (regression analysis) on urbanization and environmental conservation measures

Table 4.8: Inferential Analysis (regression analysis) on urbanization and environmental conservation measures

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.557[a]	.433	.387	1.02184

a. Predictors: (Constant), environmental conservation practices

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.015	1	1.015	.972	.025[b]
	Residual	306.982	294	1.044		
	Total	307.997	295			

a. Dependent Variable: effect on the environment

b. Predictors: (Constant), environmental conservation practices

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.614	.127		20.625	.000
	environmental conservation practices	-.034	.035	-.557	-.986	.025

a. Dependent Variable: effect on the environment

Source: Primary Data, 2022

From the table above; the value of the regression coefficient between urbanisation and environmental conservation practices the r-coefficient was computed to be at 0.557. This figure

indicates that urbanisation had a 55.7% effect on environmental conservation measures in Namanve industrial park. The standard error estimate of .61597 shows a close scatter of the data.

Table further shows the analysis of variance (ANOVA) explains further the relationship between the independent variable (urbanization) and the dependent variable (environmental conservation measures). The significance level is 0.025 implying that there is no significant effect detected between urbanization and environmental conservation practices.

The table further illustrates the regression analysis between urbanization and environmental conservation measures in Namanve industrial park, Mukono, Uganda. The regression analysis shows that the rate of conservation measured which does not depend on urbanisation is2.614. The t values for the constant and β are (20.625) and-.986) respectively with their respective levels of significance as (.000 and .025) respectively, the results indicate that continued urbanisation has reduced environmental conservation measures in Namanve industrial park.

4.3.4 Effects of urbanisations on settlements, in the Namanve industrial park

Table 4.9: Effects of urbanisations on settlements, in the Namanve industrial park,

Responses	Frequency	Percent
Congestion in households	60	20.3
People congestion	83	28.0
Poor housing	81	27.4
Poor water and sanitation	72	24.3
Total	**296**	**100.0**

Source: Primary Data, 2022

Effect of urbanisation on settlement was analysed 28.0% reported congestion; 27.4% reported poor water and sanitation; and 20.3% indicated congestion in the households.

Quality of settlement has been undreamed in the industrial area.

4.4 Environmental conservation measures in Namanve industrial park area, Mukono district, Uganda

The study's second objective set to document the environmental conservation measures in Namanve industrial park area, Mukono district, Uganda. The study results based on the field findings are presented in the tabulations and figures below.

4.4.1 Awareness of environmental conservation measures in the Namanve industrial park
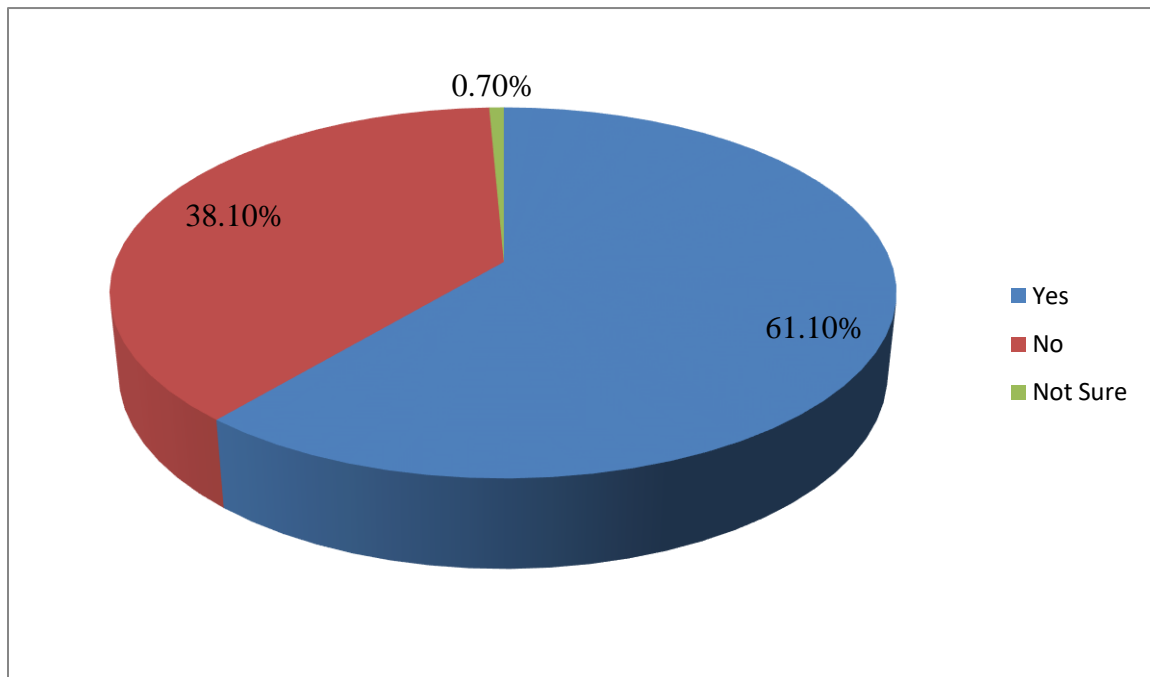
Figure 4.2: Pie chart showing awareness of environmental conservation measures

Source: Primary Data, 2022

Results in figure 4.2 on awareness of the respondents on environmental conservation measures in the industrial park area were evaluated. Results show 61.1% were aware, 38.1% were not aware, and 0.7% were not sure. Generally respondents were informed /aware of effect of urbanisation and environment in the study area and could respond for environmental conservation.

4.4.2 Environmental conservation measures in Namanve industrial park area

Table 4.10: Environmental conservation measures in Namanve industrial park

Responses	Frequency	Percent
Afforestation and Reforestation	67	22.6
Gas controls	46	15.5
Industrial waste controls	56	18.9
agricultural controls	45	15.2
Construction controls	42	14.2
Soil conservation and pollution control	40	13.5
Total	296	100.0

Source: Primary Data, 2022

Results in Table 4.10 on environmental conservation measures were assessed. Respondents indicated various responses: 22.6% indicated afforestation and reforestation; 18.9% stated. Industrial waste control, 15.5% pointed out gas controls, 15.2% indicates agricultural control, 14.2% said construction control and lastly, 13.5% resorted for social conservation and pollution. Industrial practices are in place, except for their effectiveness in addressing environmental conservation challenges.

One of the officer said:

> "Yes there are some environmental aspects provided in the Namanve industrial park with Afforestation and reforestation in places near the park, there has been continued monitoring of the park by the government and environmental watchdogs to ensure compliance with environmental guidelines"

Another officer stated:

> *"Furthermore, industries have also put controls for pollution though this is not yet much in the offing but policy and direction with some industries already established for the air pollution in the park".*

The environmental officer reiterated:

> *"There are also soil management and controls such as waste management, soil handling in order to avoid the effect of construction on the environment conditions and degradation in Namanve Park".*

4.4.3 Effectiveness of environmental conservation measures Namanve industrial park

Table 4.11: Effectiveness of environmental conservation measures Namanve industrial park

Responses	Frequency	Percent
Effective	117	39.5
Non effective	179	60.5
Total	**296**	**100.0**

Source: Primary Data, 2022

Results in Table 4.11 on the effectiveness of environmental conservation measures Namanve industrial park, Mukono revealed that 117(39.5%) respondents provided that the environmental conservation practices were effective while the majority, 179(60.5%) respondents provided that the environmental conservation measures were ineffective. The study findings based on the field indicate that the state of the results is an indication of the low effectiveness of the environmental conservation practices in the Namanve industrial park.

One of the officer stated:

> *"It is true, that efforts exist, but they are very few in ensuring the management of the environment effectively in Namanve Park".*

Interview with Industrial officer. 004

> *"The findings provided both indicate that there is less effectiveness of the approaches to enabling the conservation efforts of the environment".*

4.4.4 Whether Mukono municipality established mechanisms for environmental conservation measures in Namanve industrial park
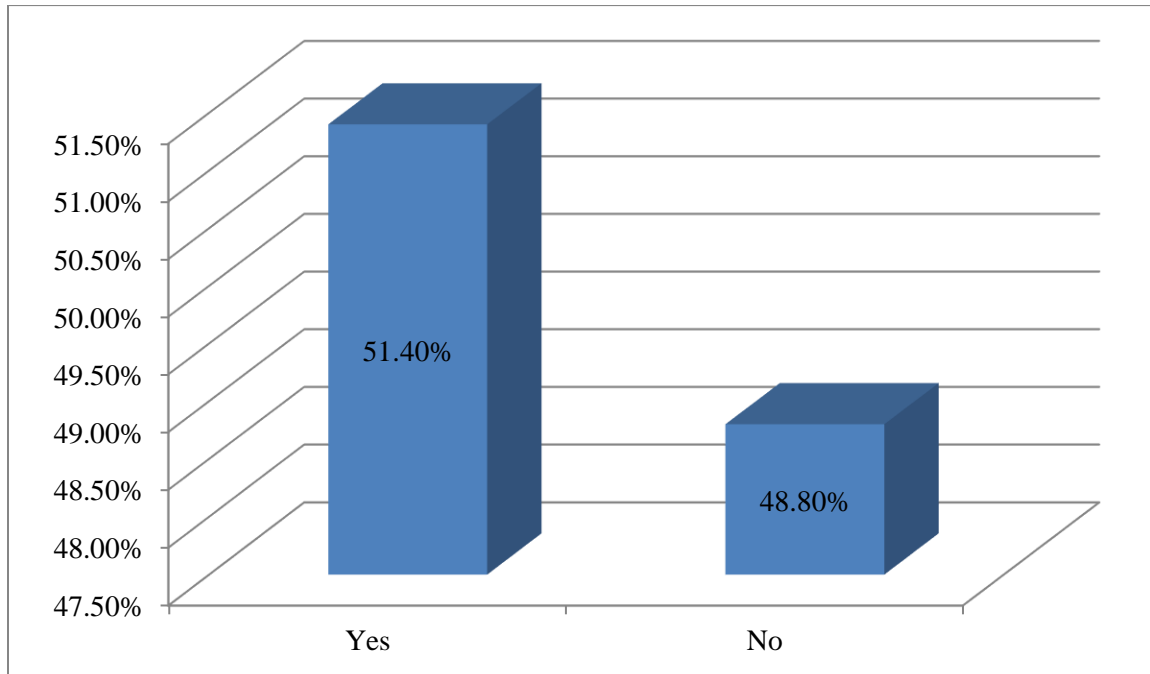
Figure 4.3: Whether Mukono municipality established mechanisms for environmental conservation measures in Namanve industrial park

Source: Primary Data, 2022

Analysis of established mechanism for environmental measures in figure 4.3 showed that 51.4% and aware, and 48.8% do not know. Respondent know about the mechanism.

4.4.5 Policy mechanisms have enhanced the provision of environmental conservation measures in the Namanve industrial park

Table 4.12: Policy mechanisms have enhanced the provision of environmental conservation measures in the Namanve industrial park

Responses	Frequency	Percent
There are bye-laws on environmental control	89	30.1
There are established environmental standards	61	20.6
There is policy on administrative management	48	16.2
There is environmental regulations and monitoring	98	33.1
Total	**296**	**100.0**

Source: Primary Data, 2022

Policy mechanisms on environmental standards analysed was revealing: 33.1% reported environmental regulations and monitoring; 30.1% indicated by laws environmental control, 20.6 stated that there are established environmental standards and lastly, 16.2% presented policy and administrative management. Indeed, the revelation is that policy mechanism to regulate environmental conservation is in existence.

4.5 Mechanisms for the implementation of environmental conservation efforts in Namanve industrial park area, Mukono district, Uganda

The third research objective was to suggest mechanisms for the implementation of environmental conservation efforts in the Namanve industrial area, in Uganda. The results attained from the field in the data collected are presented in the tabulations provided below.

4.5.1 Are their mechanisms in place implementation of environmental conservation efforts in the Namanve industrial park
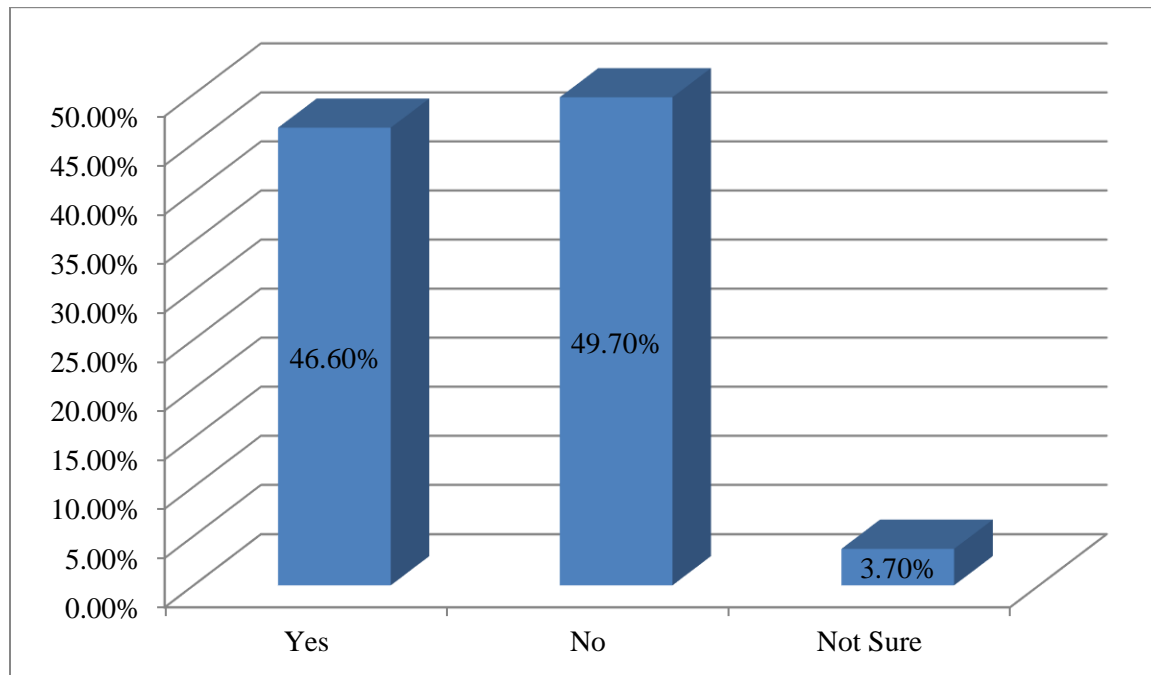
Figure 4.4: Whether there are there mechanisms in place implementation of environmental conservation efforts in the Namanve industrial park

Source: Primary Data, 2022

Analysis of mechanisms in place for the implementation of environmental conservation efforts in Namanve indicates that 46.6% of respondents were not aware and 49.7% were not aware, while 3% were not sure. The mechanism designed is not popular.

4.5.2 Mechanisms put in place for the implementation of environmental conservation efforts in the Namanve industrial park

Table 4.13: Mechanisms put in place for the implementation of environmental conservation efforts in the Namanve industrial park

Responses	Frequency	Percent
There is green environment conservation	79	26.7
There is provision of conservation policies	45	15.2
There are air pollution control mechanisms	98	33.1
The provision of information controls for environment	74	25.0
Total	**296**	**100.0**

Source: Primary Data, 2022

Mechanisms put in place for the implementation of environmental conservation efforts analysed were revealing: 26.7% reported there is green environment conservation; 15.2% indicated there is green environment conservation, 33.1% stated that there are air pollution control mechanisms and lastly, 25.0% presented the provision of information controls for environment. Indeed, the revelation is that policy mechanism is put in place for the implementation of environmental conservation efforts

4.5.3 Effectiveness of mechanisms for the control in the implementation of environmental conservation efforts in the Namanve industrial park

Table 4.14: Effectiveness of mechanisms for the control in the implementation of environmental conservation efforts in the Namanve industrial park

Responses	Frequency	Percent
Yes	137	46.3
No	117	39.5
Not sure	42	14.2
Total	**296**	**100.0**

Source: Primary Data, 2022

Analysis on the effectiveness of mechanisms for the control in the implementation of environmental conservation efforts showed that 46.3% indicated yes; only 39.5% indicated no and lastly 14.2% were not sure about the effectiveness of mechanisms for the control in the implementation of environmental conservation efforts.

4.5.4 What has the Mukono district local government done in guidance to the locals on the deforestation

Table 4.15: What has the Mukono district local government done in guidance to the locals on the deforestation

Responses	Frequency	Percent
Establishment of bi-laws on forest preservation	89	30.1
Community awareness campaigns on forest value	53	17.9
Enhanced the development of skills for proper forest usage	87	29.4
Environmental enforcement controls	67	22.6
Total	296	100.0

Source: Primary Data, 2022

Analysis on what has the Mukono district local government done in guidance to the locals on the deforestation were revealing: 30.1% reported establishment of bi-laws on forest preservation; 17.9% indicated community awareness campaigns on forest value, 29.4% stated enhanced the development of skills for proper forest usage and lastly, 22.6% presented environmental enforcement controls. Indeed, the revelation is that Mukono district local government has done something in guidance to the locals on the deforestation

One of the officers stated:

> *"There is a need for the media in raising awareness about the impacts of deforestation. Traditional leaders should call community members in traditional gatherings to raise awareness about the impacts of deforestation. Government should integrate social and environmental policies by using the community*

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education model to mobilize, impart knowledge, and change attitudes and practices to deal with the impacts of deforestation".

An environmental officer stated:

"Guiding principles should be followed as agreed upon before the opening of an industry. For example, putting restrictions on energy to be used in industries such as there must be no use of firewood".

In the study, the researcher found that the state of the environmental controls exist in Namanve industrial area although not very appropriate in facilitating the development of an effective and green environment for Namanve industrial area.

4.5.5 Avenues that can be developed for implementation of environmental conservation efforts in the Namanve industrial park

Table 4.16: Avenues that can be developed for implementation of environmental conservation efforts in the Namanve industrial area

Responses	Frequency	Percent
Planting of trees	36	12.2
Reducing deforestation	60	20.3
Reporting those cutting trees	63	21.3
Effective environmental monitoring	137	46.3
Total	**296**	**100.0**

Source: Primary Data, 2022

Analysis on avenues that can be developed for implementation of environmental conservation efforts were revealing: 46.3% reported effective environmental monitoring; 21.3% indicated reporting those cutting trees, 20.3% stated reducing deforestation and lastly, 22.6% presented

planting of trees. Indeed, the revelation is that there are avenues that can be developed for implementation of environmental conservation.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter is concerned with the discussion of the findings based on the objectives of the study. These discussions are done based on the information obtained from the research in comparison to the previous studies indicated in the literature.

5.1 Discussion of findings

5.1.1 Effect of urbanization on the environmental conservation measures in the Namanve industrial park area, Mukono district, Uganda

The regression analysis between urbanization and environmental conservation measures in Namanve industrial park, Mukono district, Uganda. The regression analysis shows that the rate of conservation measured which does not depend on urbanisation is2.614. The t values for the constant and β are (20.625) and-.986) respectively with their respective levels of significance as (.000 and .025) respectively, the results indicate that continued urbanisation has reduced environmental conservation measures in Namanve industrial park area. The findings agree with Bodo, (2019a) that urbanization affects all sizes of settlements, so villages gradually grow to become small towns, smaller towns become larger towns, and large towns become cities. This trend has led to the growth of mega-cities. It is possible that in some localities, residents may not need to relocate or migrate to nearby cities for greener pastures, but may see the opportunities they desire, come to them; as some rural settlements metamorphose into urban settlements. Also, it is in agreement with Reusswig (2018) who contend that inhabitants live in impoverished slums and squatter settlements (UN-Habitat, 2012). Slums are urban areas that are heavily populated and have sub-standard housing with very poor living conditions, creating several problems. Also, literature such as Tamale (2016) affirms that when people move in their numbers to a particular location, there will be pressure on food supplies and on food distribution in such areas. However, in the rural areas in developing countries, the majority of the residents are subsistence farmers who have no food challenges, but rather usually have food in excess for market supply.

5.1.2 Environmental conservation measures in the Namanve industrial park area, Mukono district, Uganda

The study results found that afforestation and reforestation were some of the environmental conservation measures engaged in the study area. Others included industrial waste controls, gas control mechanisms, then agricultural controls and construction controls. However, it was discovered that there was low effectiveness in the environmental conservation measures. The results agree with Von (2015) who contends that industrial waste is one of the sources of water and soil pollution hence control of this waste can be very useful in conserving the environment. These industrial wastes and gases can be controlled by treating them before dumping them and taxing the industries to raise money which can be used to clean up the environment of the industrial wastes. Kyeremeh (2015) indicated that reforestation is the natural or intentional restocking of existing forests and woodlands that have been depleted, in the industrial area. Therefore, reforestation can be used to improve the quality of human life by soaking up pollution and dust from the air, rebuilding natural habitats and ecosystems, mitigate global warming. Hence, people need to know the importance of environmental conservation and how they can help in the process. This is because some people destroy the environment simply as they do not know the impact of their actions while those that would have loved to be part of environmental conservation lack the know-how.

5.1.3 Mechanisms for the implementation of environmental conservation efforts in the Namanve industrial park area, Mukono district, Uganda

The study indicates that there are some mechanisms put in place for the implementation of environmental conservation efforts in the Namanve industrial park area, Mukono district, Uganda. Mechanisms put in place for the implementation of environmental conservation efforts analyzed were revealing: 26.7% reported there is green environment conservation; 15.2% indicated there is green environment conservation, 33.1% stated that there are air pollution control mechanisms and lastly, 25.0% presented the provision of information controls for environment. Indeed, the revelation is that policy mechanism is put in place for the implementation of environmental conservation efforts. The findings were in agreement with Arboleda (2016) who argues that building sustainable and environmentally-friendly cities must

involve the passing of laws that sustains the planning and provide environmentally sound technologies. Kahangirwe (2012) affirms that to lessen the negative effects of rapid urbanization and at the same time conserve natural ecosystems, private investments should be encouraged to utilize natural resources and create more jobs. In agreement with Bodo (2019b) who argued that policies that favor rural settlements policies of government must be visible in the environment. Consequently, countries that are regarded as developed, attained such status through effective policy implementation that is geared toward improving the standard of living of its citizens, while underdeveloped and developing countries have no policies or have few policies on environmental sustainability and conservation.

5.2 Conclusion

The results indicate that continued urbanisation has frustrated environmental conservation in Namanve industrial park area, Mukono district, Uganda.

On the first objective, the study shows that increased urbanisation reduced the environmental conservation measures in Namanve industrial park, Mukono district, Uganda, thereby, when increased urbanisation is not properly managed.

Secondly the study realizes that there was ineffectiveness in the environmental conservation practices in Namanve industrial park area, Mukono district, Uganda.

Thirdly, the study concludes that there is limited existence of environmental conservation measures in the Namanve industrial park area, Mukono district, Uganda. This indicates that environmental conservation mechanisms are far below the standards expected. Therefore there is a need to increase afforestation and reforestation alongside other conservation measures that were put in place by the industries in the Namanve industrial park area, Mukono district, Uganda.

5.3 Recommendations

- Local government should be given power in the implementation and monitoring of policies because they are near to the society compared to the central government hence be easier to ensure that policies are being adhered to especially on the control of waste

products from households and industries. That is Policy monitoring and implementation should be across the society and decentralized.

- The National Environmental Management Authority (NEMA) together with the government and other organizations should carry out various projects like tree and flower planting within urban areas to curb down the effects of rapid urbanization as they implement other strategies like, recycling of wastes, Environmental Impact Assessment and ensuring better urban planning.

- There should always be regular monitoring and evaluation of the study area by the environmental officer of the NEMA and the concerned local government

- Environmental Audit of industries and the industrial layout must be monitored, evaluated and enforced by ministry of trade.

- District lower local government need to continue teaching the community about the effect of improper use of the environment. This can be effective through regular workshops and the provision of environmental should start at the family level which is the grass root, and later by government and religious institutions.

- The Ministry of Water and environment should be encouraged to reduce and use a proper system of disposing of emissions in industries by using alternative ways. This can be done through proper conduct of Environmental Impact Assessment which must be highly considered before opening any industry as well as a community should be involved in decision-making concerning industries around their residents.

- Local communities should be continuous in afforestation and reforestation in the study area.

- Industrialists together with the government should promote sustainable management of urban natural resources. Sustainable development requires careful cost-benefit analysis in order to craft development and environmental policies.

5.4 Areas for further study

Further analysis of the survey data on urbanisation and environmental management needs to be further assessed on the following.

- Urban Planning and Environmental Management
- Environmental controls and community wellness

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APPENDICES

Appendix I: Questionnaires for the Respondents

Dear respondents,

I am, **2021-08-05035** a **master's degree of environmental management of Kampala International University** conducting a research on "**Assessment of the impact of urbanization on environmental conservation measures in Namanve Industrial Park area, Mukono District, Uganda**. You are among the respondents randomly selected will provide me with the appropriate information. The information you will provide here will be treated with utmost confidentiality and used for academic purposes only.

In this section, you are kindly requested to tick that alternative response that fits your opinion.

SECTION (A)-DEMOGRAPHIC ASPECTS

1. **Gender**
   a) Male $\qquad$ ☐
   b) Female $\qquad$ ☐

2. **Age**
   a) 20 – 29 $\qquad$ ☐
   b) 30 – 39 $\qquad$ ☐
   c) 40 - 49 $\qquad$ ☐
   d) 50 + $\qquad$ ☐

3. **Qualification academically**
   a) Certificate $\qquad$ ☐
   b) Diploma $\qquad$ ☐
   c) Degree $\qquad$ ☐
   d) Masters $\qquad$ ☐

4. **Marital status**
   a) Single $\qquad$ ☐
   b) Married $\qquad$ ☐
   c) Separated/divorced $\qquad$ ☐

5. **Position**

   a) Administrator [　　　　]

   b) Staff [　　　　]

   c) Manager [　　　　]

6. **Time period**

   a) 1-4 years [　　　　]   c) 10-14 years [　　　　]

   b) 5-9 years [　　　　]   d) 15 and above [　　　　]

Section B: Effect of urbanization on environmental conservation measures in Namanve Industrial park area, Mukono district, Uganda

9. Are you aware of the effect of Urbanisation on environmental conservation measures in Namanve Industrial park area, Mukono, Uganda

   a) Yes [　　　　]

   b) No [　　　　]

   c) Not sure [　　　　]

10. What is the effect of urbanization on environmental conservation measures in Namanve Industrial park area, Mukono, Uganda

    a) Congestion

    b) Environmental degradation

    c) Burning of fossil fuels

    d) Air pollution

    e) Any other mention...

11. What are the effects of urbanisations on settlements, in Namanve Industrial park area, Mukono, Uganda

    a) Congestion in households

    b) People congestion

    c) Poor housing

    d) Poor water and sanitation

    e) Any other mention...

Section C: Environmental Conservation Measures in Namanve Industrial park area, Mukono district, Uganda

7. Are you aware of any environmental conservation measures in Namanve Industrial park area, Mukono, Uganda?

Yes   ☐

No   ☐

Not sure   ☐

8. What are the environmental conservation measures in Namanve Industrial park area, Mukono, Uganda?

Afforestation Practice   ☐

Reforestation practice   ☐

Control industrial gases Practices   ☐

Industrial sewage Treatment Practices   ☐

Control of industrial fertilizers   ☐

Control fishing activities Practices   ☐

Control construction Practices   ☐

Soil conservation   ☐

Waste Management   ☐

Pollution Control   ☐

Other, Please, mention..

....

9. How effective are the environmental conservation measures Namanve Industrial park area, Mukono, Uganda?

Effective   ☐

                      ☐

Less effective

10. Has Mukono municipality established mechanisms for environmental conservation in Namanve Industrial park area, Mukono, Uganda?

Yes   ▭

No   ▭

11. What Policy mechanisms have enhanced the provision of the environmental conservation measures in Namanve Industrial park area, Mukono, Uganda?

There are bye-laws on environmental control

There are established environmental standards

There is policy on administrative management

Any Other, mention.   ....

....

Section D: Mechanisms for the implementation of environmental conservation efforts in Namanve Industrial park area, Mukono district, Uganda

12. Are there mechanisms in place implementation of environmental conservation efforts in Namanve Industrial Park area, Uganda?

     a) Yes

     b) No

     c) Not Sure

13. What are the mechanisms put in place for the implementation of environmental conservation efforts in Namanve Industrial park area, Uganda?

a) There is green environment conservation

b) There is provision of conservation policies

c) There are air pollution control mechanisms

d) The provision of information controls for environment

e) Any other mention...

14. How effective are the mechanisms for the control in implementation of environmental conservation efforts in Namanve Industrial park area, Mukono, Uganda?

a) Yes

b) No

c) Not Sure

15. What avenues can be developed for implementation of environmental conservation efforts in Namanve Industrial park area, Mukono, Uganda?

a) Planting of tress

b) Reducing deforestation

c) Reporting those cutting trees

d) Any other Mention …………………...

16. If Yes, What has the Mukono district local government done in guidance to local on the deforestation in Mpanga forest reserve?

a) Establishment of bi-laws on forest preservation

b) Community awareness campaigns on forest value

c) Enhanced the development of skills for proper forest usage

d) Any other, please mention

Appendix II: Interview Guide

1. What environmental conservation measures are implemented in Namanve industrial park area, Mukono, Uganda?

2. How are the environmental conservation measures implemented in Namanve industrial park area, Mukono, Uganda?

3. How does urbanization affect the environmental conservation measures in Namanve industrial park area, Mukono, Uganda?

4. How does urbanization affect the settlements in Namanve industrial park area, Mukono, Uganda?

5. What are the possible constraints to environmental conservation mechanisms can be implemented in Namanve industrial park area, Mukono, Uganda?

6. What possible environmental conservation mechanisms can be implemented in Namanve industrial park area, Mukono, Uganda?