PLASTIC WASTE MANAGEMENT - RECYCLE THROUGH SCULPTURAL INNOVATION: THE CASE FOR IGANGA MUNICIPALITY

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DECLARATION

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DEDICATION

I dedicate this book to my beloved ones. To my mother, Ann Mary Nsalasatta, who started me off and encouraged me on my long journey of academic work. To my wife Miria and my children, Esther, Jorum, Joyce, and Herbert, for their endurance during my course of study.

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DEFINITION OF TERMS

Disposal—this, in terms of waste, refers to the gathering, subjecting them to certain processes, and putting them to use by human beings who obtain them thereafter.

The term "environment" refers to a collection of items, which may include humans, plants, animals, insects, or waste, that define the geographical layout of a given area.

Packaging can refer to the technical management or a process which involves design, evaluation, or production of items subject to preservation, transportation, information, and sales.

Plastic-implies an annually discarded item or substance that is artificial and in varying sizes, for example, nets used for fishing and those that can only be seen using microscopes on land, along or in water bodies. Plastics have a wide range of applications, from domestic to industrial, depending on who you ask.

Plastic waste refers to artificial materials or objects that are discarded on land or in bodies of water after they have lost their value. Plastic waste is mostly in the form of containers.

Waste management refers to the various ways of putting objects that have been disposed of by human beings to use through industrial or technical processes. The products from waste are later brought back to the community and used in different forms.

Hygiene refers to a combination of activities initiated by human beings to keep the environment around them clean and safe for them to be healthy physically and mentally.

Sculptural innovations is the artistic visual inventions of three dimensional form practically made in the studio.

Sculptural methods are manipulative techniques of producing three dimension, sculptural forms.

LIST OF ABBREVIATIONS AND ACRONYMS

PET	Polyethylene Terephthalate
HDPE	High-Density Polyethylene
PRI	Plastic Recycling Industry
OAG	Office of the Auditor general report.
EMF	Environmental Management Forum
PP	Polyethylene
EPA	Environmental Authority.

ABSTRACT

This Study was intended to demonstrate how well solid waste can be turned into useable materials through a process called recycling. The recycled material can then be used as source of income for the workforce involved in beautifying the compounds, sitting rooms, designing areas for tourism attractions, and other major uses. This study explored possibilities of manipulating plastic waste (pet bottles and polythene bags) to produce sculptural art forms in order to promote plastic waste mitigation. The objectives of the study were : (i) to assess the effectiveness of plastic waste management in Iganga Municipality; (ii)to analyze the physical properties of plastic waste damped in Iganga Municipality; (iii) To explore studio-based means of manipulating plastic waste for sculpture production and (iv) to produce prototypes of sculptures from selected plastic waste in Iganga Municipality.

The study employed qualitative and studio –based sculptural methods. Data collection tools included questionnaire, observation, photography, interviews and studio explorations. During the studio exploration materials were woven together using plastic threads with interlacing of bottle seals to produce ropes of various impressions. These were assembled to form a variety of sculpture forms.

The study revealed that most household respondents use plastic bags to store plastic waste. And that burning (incineration) was a common method of disposal within households. Recycling was done by a few manufacturers because it was considered expensive. The study also confirmed that the existing policy on plastics (ban on polythene bags thinner than 30 microns) lacks implementation. It was revealed that there was no statistically significant association between the methods of plastic disposal and other variables. It was established that most waste collectors have a negative attitude towards plastic waste collection because they earn little income from it. The study revealed that most households carelessly throw plastics away and that they end up on the streets, drainage channels and the lake despite the government's ban on the use of plastic bags. Consequently, there is continuous circulation of polythene bags and other plastics within the municipality. The study revealed that most of the stakeholders are not willing to sort plastics from waste. The municipality has no clear plastic waste management strategy. The study revealed that plastic waste management practices in Iganga are still ineffective, and this is attributed to a lack of implementation of government policy and legislation on plastic waste. There is a need to sensitize the public about the environmental damage caused by plastics. Artists have a role to play through sculptural innovations. The findings of this thesis will help artists to learn new skills of plastic waste manipulation. The studio exploration revealed that art, and in particular sculpture, can be developed from plastic waste. This provides an opportunity for municipal councils to sensitize the community about the prospects that art presents in the fight against plastic waste pollution within their communities.

CHAPTER ONE: INTRODUCTION

This study was intended to demonstrate how well plastic waste can be turned into usable materials through art by process of recycling. The recycled materials can then be used as a source of income for the workforce involved in beautifying the compound, sitting rooms, designing areas for tourist attractions, and other major uses. This study is premised on the realization that everywhere across the universe, the aspect of plastic waste is necessary. It does not consider the status of people living in an environment, nor does it consider gender. Art has been recognized as a medium through which environmental conservation can be successfully addressed in Iganga municipality .Many people have limited knowledge about using art to form sculpture from plastic waste. Everyone attempts to account for solid waste each day. Most of the solid waste dissolves, but plastic waste takes a long time to dissolve, if it does. The un- dissolved plastic waste then becomes so difficult to contain as it has adverse effects on the natural resources such as lakes and rivers, in turn causing adverse effects on the marine life. Considering the agricultural zones, plastic waste may interfere with the ability of land to be agriculturally productive. All the fore mentioned, are without taking a close look at the environmental contamination side of plastic waste. With all this at stake, artists can play a pivotal role of creating awareness to communities through sculptural innovations. This chapter presents the background to the study, statement of the problem, purpose, objectives, research questions, significance, scope the study and conceptual perspective.

1.1 Background to the study

According to Nathanson (2022), all human activities have the capacity to create waste. It's the way these wastes are gathered, stored, and disposed of that can pose risks to the surroundings and to public fitness. As city populations grow and consumption patterns change, solid waste management (SWM) has become a growing global issue. As a result, the problems, and troubles of SWM seem of vast importance in developing cities. Demanding

situations that relate to waste tracking and strategic management are numerous. They vary from rapid loss of biodiversity, depletion of natural ecosystems, unsustainable use of natural resources, depletion of nonrenewable sources, and over-exploitation of fishing resources mainly in the inshore areas. Emerging pollutants of inland river sediments with micro plastics and consequently the implications on rivers as shipping of micro plastics into the water loads is of foremost significance. According to Nabukenya (2018), a local artist whose work is out of carrier bugs (kavera). The gathering of municipal solid waste is a public service that has important impacts on public fitness and clean appearance of cities. Unfortunately, many city administrations seem to be losing the war on dealing with the ever-increasing quantities of waste. Benjamin, et al., (2015) points out that the challenge is made greater by the diversity of materials within the waste, which is not specifically food waste and ash, but consists of more plastic packaging, paper, and discarded electronic systems. At the climate Lab Africa 2022, Suubi (2020) a plastic artist made a costume from 500 green plastic bottles and presented to fully packed stadium.

Figure 1: Uganda artist Nabukenya using carrier bags (kavera)

Plastic waste disposal has caught the interest of environmentalists due to its lack of biodegradability and in aesthetic terms because it is not disposed off scientifically and has the potential to contaminate soil and subsoil water due to leachates (Ackerman, 2000). The technology employed is mechanical recycling, which is based totally on traditional grinding

extrusion to attain granules. Ugandan artist S. Ssenkaaba (2019) made various artisict works using waste materials. Mechanical recycling is the most desired and broadly used method of recycling, and it recycles all sorts of polymers used in water and soft drink bottles. Because it requires selected plastic waste, the value for sorting, cleansing, and keeping apart decided on polymers increases the running cost. The present mechanical recycling system may additionally emit harmful gases due to its vintage design and not having provision for pollution control. Despite all this, most of difficult situations for the procedure are associated with plastic waste content, which includes laminated plastics and carry baggage.

Plastic is the overall term for a wide variety of artificial or semi-artificial natural solid materials. Plastics are generally polymers of excessive molecular weight. They are mostly synthetic, with the majority derived from petrochemicals; however, many are partially herbal. A polymer may include different components like plasticizers, stabilizers, lubricants, UV-absorbing fabric, flame retardants to improve overall performance. Suubi (2020) Sandra Suubi is a gospel artist who recycles plastic into drums. Plastics have permeated each facet of human life, such as entertainment, packaging, agriculture, water transportation, building creation, telecommunication, schooling, medication, transportation, defense, consumer durables, to name some. One of the reasons for the extreme popularity of plastics is the remarkable range of properties exhibited by their use due to their ease of processing. Hence, the demand for plastics has been increasing in contemporary dwellings to enhance the satisfaction of existence. The quantum of plastic waste in municipal solid waste (MSW) is growing due to growth in the population, sports development, and changes in lifestyle (Oksana, et al. 2019). The health and environmental implications related to stable waste control are growing, especially within the context of developing international locations and regulatory requirements for environmental clearance. At the same time, structural analysis of

huge engineered systems has been used to help SWM groups in industrialized countries since the sixties, when collection and elimination dominated the SWM quarter in growing nations.

The multiplied uses of plastic products as packaging applications within the last few years have increased the quantity of plastics in the solid waste flow. Similarly, the amount of solid waste is increasing because of population growth, development activities, lifestyle changes, and socioeconomic situations (Mikael, et al., 2019). As compared to natural waste, plastic can take hundreds and lots of years to completely decompose in nature (Wafar et al., 2016). In 2016, the world generated 242 million lots of plastic waste. This waste mostly originated from three regions, which might be fifty-seven million heaps from East Asia, 45 million heaps from Europe and primary Asia, and 35 million heaps from North America. As an example, in India, due to its developing urban populace, it is estimated that approximately 15722 tonnes of plastic waste were generated on the premise of according to capita intake primarily based on population.

EPA (2022) established that plastic waste has an enormous element in General Municipal Solid Waste (MSW). Although municipalities have designed formal systems of waste collection within their regions, the waste control services have been supplemented via the non-public casual zone. The plastic waste creditors inside the personal quarter regularly collect fee-added plastic waste, which includes pet bottles, jerry cans, and jars. This has caused disparities in the types of plastic waste being accumulated by the groups and has caused the retention of unsafe plastic carry baggage and occasional-great plastic of less than 20 microns. A look carried out with the aid of the national Environmental Engineering research Institute (NEERI) for the Brihan Mumbai Municipal corporation, which handles more than five thousand metric tons of MSW a day, suggests that plastic waste is 0.75%. In Europe and the USA, plastic waste makes up 8% of general MSW. The rest is made up of

natural substances (33%), paper and paperboards (30%), glass and metals (16%) and others (13%).

About one-to-two thirds of the strong waste generated is not collected. As a result, the uncollected waste, which is blended with human and animal excreta, is dumped indiscriminately in the streets and in drains (Awuchi, 2017). This contributes to flooding and the breeding of insect and rodent vectors that spread illnesses. Furthermore, even gathered waste is regularly disposed of in out-of-control dumpsites and/or burnt, polluting water assets and the air. In the growing international context, it is the urban poor, frequently within the peri-urban regions, who are suffering most from the lifestyle-threatening situations deriving from deficient SWM, as municipal authorities tend to allocate their limited monetary assets to the richer areas of better tax yields where residents with more political strain are living. An essential feature regularly stated while dealing with the urbanization of the developing world is the rapid increase of "huge" cities and metropolitan regions. Rapid urbanization is taking place, especially in low-profit nations. However, they are no longer the most effective because those huge city agglomerations represent a massive mission for environmental services (Awuchi, 2017).

The packing containers and packaging category had a plastic tonnage of over 14.5 million tons in 2018. This category includes luggage, sacks, and wraps; other packaging; Polyethylene Terephthalate (PET) bottles and jars; high-density polyethylene (HDPE) herbal bottles; and different boxes (Awuchi, 2017). Manufacturers also use plastic in durable items, including home equipment, furniture, casings of lead-acid batteries and other products. Moreover, plastics are found in nondurable products, including disposable diapers, trash bags, cups, utensils, medical gadgets, and household items, inclusive of bath curtains. As a result, implementation of plastic waste control tasks is vital. The demanding situations associated with plastic waste management relate to financial and licensing methods for

tracking of imposing companions. For instance, it has additionally been stated that the strategies for recycling and the technology often utilized by most municipalities in developing international locations are outdated. In addition, it has additionally been observed that recycling industries in less advanced nations engage in unhygienic and health-hazardous practices of recycling plastic waste and scrap. Over 300 million metric tons of plastic are produced worldwide each year, with approximately half of this volume used for disposal packages, or products that are discarded within a year of purchase. The resultant pollutants clog up our rivers, oceans, and lands and adversely influence biodiversity (Awuchi, 2017).

Plastic waste management has come to be a topical problem in Africa. According to Babayemi, Nnorom, Osibanjo, and Weber (2019), the African continent could consume approximately 344,000 tonnes of polymers and plastics by 2030. The predominant challenges especially relate to the elevated infection of marine and freshwater environments across the continent. Almost 513 million tonnes of plastic end up in the oceans each year, with Egypt (0.97 tonnes), Nigeria (0.85 tonnes), and South Africa (0.63 tonnes) ranking seventh, ninth, and eleventh in the list of 20 major polluters. In lots of African international locations, approximately 12% of waste plastics are recycled, and the rest are disposed of, burned, or buried.

According to Ritchie (2018) over time, most plastic degrade and can be transported by storm run-off. The wide variety of registered polymers makes it a huge task managing the products when they become wastes, especially when they are mixed. The scenario in some African countries is worse as wastes are not separated at the source and the basic waste management facilities are lacking .Lack of infrastructure and logistical requirements in Africa, prevents recycling of plastic waste especially when it's combined. The prices associated with recycling plastics, which include hauling, sorting, cleansing, and breakdown into flakes known as fiber, are pricey. All plastic recycling calls for devices, this requires excessive electricity fees or

needs and adequate or reliable electricity source.(gadian,2019). As a result, plastic waste is dumped in open, out-of-control landfills.

The Environmental Sciences Europe journal (Babayemi, Nnorom, Osibanjo & Weber; 2019) offered the primary continental ancient evaluation of mass-imported polymers and plastics in number one and number two papers, and the associated pollution capability in Africa, by means of figuring out and synthesizing dispersed worldwide alternate facts on the imports through the United Nations (UN) Comtrade database and the usage of harmonized device (HS) codes for various polymer categories and product classes. Furthermore, the study assessed the volume of waste generated by plastic products as well as the popularity of recycling. It showed that more than 117.6 Mt (anticipated at $194.5 billion), inclusive of about 86.14 million tonnes (Mt) of polymers in primary form and 31.50 Mt of merchandise, entered Africa through 33 nations between 1990 and 2017 (the other 19 countries do no longer have enough data). Of this amount, there have been considerable contributions from Egypt (18.4%), Nigeria (16.9%), South Africa (eleven.6%), Algeria (eleven.2%), Morocco (9.6%) and Tunisia (6.9%). The study discovered that by 2030, about 235.3 Mt of polymers and plastics in that paperwork would be eaten up in these 33 African countries if there weren't any coverage modifications to reverse this fashion. For the whole continent, this would amount to the consumption of 344 Mt of plastics by 2030.

As a result, there may be a need for sustainable control of waste plastics in Africa. Capacity mitigating techniques include discounts, reuse, recycling, waste conversion to energy, and suitable policy frameworks for plastic management and restriction. A model may be made from the Rwandan experience (Anna, Dimmock, Ruwanthi, Irakoze, & Nia, 2021). Rwanda demonstrates that, with bans on plastic baggage, regulations, and strict enforcement, an extensive discount on plastic import and use may be finished. For instance, the usage of polymers from classes HS 3908–3916 is now at the minimum levels of the remaining decade.

In June 2019, Rwanda's cabinet approved a draft regulation seeking to limit the manufacture, use, and sale of single-use plastics.

In the last decade, Rwanda has witnessed a yearly GDP growth of between 4.7% and 8.9% and a growth in GDP in keeping with capita GDP from $1229/year in 2008 to $2080/yr in 2017. This demonstrates that, with the right policies, a reduction in plastic imports and use in a rural area is possible alongside universal industrial growth without negative consequences. But the fun in Rwanda, contrasts with the otherwise increasing plastic intake in other African international locations (Anna et al., 2021).

Uganda is going through a speedy urbanization of 5.1% per annum, leading to overcrowding and the improvement of slums and informal settlements with negative waste control practices. City dwellers usually devour more assets than rural dwellers, and so generate large quantities of solid and plastic waste. Waste control in these regions is hampered with the aid of more than one land tenure system, with many tenants now not having a right to the land and, consequently, no longer capable of managing waste regionally. Municipal councils well know that the amount of solid and plastic waste generated overwhelms their ability to collect and dispose of it given their full-size series fees. In Kampala, the capital town, out of 1,200–1,500 tons of waste generated in a day, only 400–500 tons are accrued, giving a set efficiency at best 40%. This means that 60% of solid and plastic waste generated every day isn't well collected and disposed of. This has resulted in indiscriminate disposal by the public.

Plastic and waste pollution remain one of the most serious environmental concerns in most Ugandan municipalities, particularly given the rise of single-use plastics. Plastic pollutants contain toxic pollutants that damage the environment and cause land, water, and water pollution. Many growing international locations on the African continent depend on the casual waste selecting and accumulating sector (Harinaivo, et al., 2016). These waste pickers

are usually young people who are unemployed, have low levels of schooling, and are searching for any form of income to sustain themselves (Auler, 2014). They presently play an invaluably crucial role in the recycling efforts of pets and other plastics. It's predicted that there are approximately 15 to twenty million casual waste creditors globally (Oates, 2019). Their function is to collect, normally by hand; recyclable plastic after it has already been consumed and dumped. They then transport this plastic both by bicycle and by walking to a set website in exchange for payment (Gall, 2020). Several Ugandan websites are still widely distributed in the United States. Once packaged and taken care of at a set website using a small institution of full-time employees, the plastic is sent to aggregation websites and recycling vegetation, such as Plastic Recycling Industries (PRI), that's accountable for recycling approximately 18% of all plastic waste generated within the capital city (Oates, 2019). After preparation of the uncooked fabric inputs of PET, the plastic can then be molded into bottles again and is ready for future use. The recycling industry is in its infancy in Uganda and, as such, the hassle of strong waste accumulation on the landfill keeps rising. However the artist has come in strongly to put plastic waste to use by manipulating them into sculptural forms.

Precisely, there are over 30 corporations registered as plastic recycling agencies in Uganda (KCCA Cost Chain Mapping Record, 2017). These encompass both formal and casual recyclers. Most of those are engaged in the recycling of polyethylene (both HDPE and LDPE) and polypropylene (PP). It is the most recycled plastic in Uganda. Four fundamental corporations are involved in turning plastic into PET flake for export to China and India, mainly to be used in making polyester cloth. They manufacture puppy flakes in the main for export to China and, to a lesser volume, recycle HDPE bottles to feed local production of plastic merchandise together with jerry cans, basins, and bottle caps. The 4 groups export

582MTT in total per month, worth $250k. The largest recycler, of course, is PRI, a Coca-Cola subsidiary with a 45 percent market share.

Paper and cardboard recycling is also occurring on a small scale, whereas metal recycling is the most developed recycling enterprise in Uganda, driven by growth in the creation enterprise as well as welding and fabrication in the informal foundry quarter. The polythene bag ("Kaveera") industry has been in turmoil, with a government ban that the government has not been successful in enforcing. Ugandans have constantly failed to enforce the ban on Kaveera. The industry has a lobby group, Uganda Plastic Producers and Recyclers Association (UPMRA), created by forty-five manufacturers and recyclers of Kaveera.

Plastic Recycling Industries Uganda Limited (PRI), the biggest plastic recycling enterprise in Uganda, in partnership with KCCA, has created a version that creates and helps a CBO to collect plastics at the household level. Almost all the waste accrued by families and institutions is blended or unsorted waste. While a waste collection truck picks up waste, the collector's employees, or "loaders," fast rummage through the waste and extract as many of the valuables as feasible, especially plastics (e.g., puppy bottles, plastic packing containers, Kaveera, and steel (e.g., aluminium, copper, and metal). Most plastic recyclers also recycle used jerry cans, plastic plates, and a variety of other items have been used in making new merchandise. 22% of PRI's recycling fabric is HDPE (its 2nd-largest product). HDPE isn't always easily to be had, and its scarcity is contemplated in its rate of 850/= to 1,050/= ($zero.24–$0.029) in step with kg. This could be because of the enduring nature of the goods, e.g., jerry cans, plastic plates, and so on. The recycled resin is sold domestically to producers which include Victoria Nile (for Jerry Cans), Mukwano (for bottle caps), or even local plastic ground tile manufacturers.

With plastic pollutants and climate change at the vanguard of everybody's minds, it's no surprise that artists are starting to look at our waste in a new way, growing effective art works

that are not only beautiful, but also serve as a stark reminder of the effect of our waste on the environment. As a result, recycling has come to be a critical movement to protect the environment. Inside this location, two tactics have emerged: down cycling and up cycling. Even as inside the former, the negative cycle is slowed down, but the ensuing gadgets lose quality due to the procedure, even as inside the latter they collect cost for the creative interventions through art (Malaka, 2020).

Innovations via up-recycling have emerged in different elements of the sector in reaction to the demanding situations offered by plastic waste pollutants. Those improvements have led to the emergence of a creative movement known as recycled artwork. Such movements have been a source of ideas for many artists around the sector, upholding vital messages regarding excessive intake and environmental pollutants. Recycled art seeks to transform waste into works of art, including plastic, paper, cardboard, wood, glass, metals, and rubber. The idea, goes past the conventional recycling of substances by means of growing gadgets that exceed the financial, cultural, and social price of the authentic product (Hamid, 2016).

Plastic waste management mitigation started in the early decades when diverse countries and municipalities got engaged in finding diverse mitigation measures to cut back on waste of all paperwork. Although the definition of the concept affords a diverse vocabulary, the general concept of recycled art was born in 2002 while William McDonough and Michael Braungart defined up cycling in their e-book "Cradle to Cradle redesigning the way, we do matters" (Kelly, 2017). Traditionally, such varieties of art aren't new. Indeed, they can be compared to movements from other times. For instance, one should compare them to Pablo Picasso or George Braques' collages made with vintage newspapers or magazines at the start of the 20th Century. They are also comparable to works from faculties such as Pop art, Trash art, and Drap art. In other spheres, the concept has additionally been known as plastic waste control mitigation (the action of decreasing severity and/or seriousness).

In China, the use of functional art as a waste management strategy became embraced in 2005 when plastic waste became an extraordinary circle of relatives of substances that accrued interest due to their ubiquity within the global economic system and the environment that impacted on associated current disposal techniques (Ellen, 2017). Visual art about plastic pollution creates visible and emotional facets and opens dialog with a target audience that results in extra environmental cognizance.

Rapid monetary improvement and population increase, inadequate infrastructure and knowledge, and land scarcity make the control of municipal solid waste grow to be one of every one of Uganda's most essential environmental problems (Kayemb, 2015). The Iganga municipal governance council has made efforts to reduce plastic waste pollution. The council has shrunk private collectors as well as promoted campaigns aimed toward sensitizing the public about the dangers of plastic waste pollution (Domic, 2022). The initiatives put in place are both steeply priced and unsustainable. Currently, the council falls short of exploring fee-powerful techniques that aim at reducing plastic waste pollutants in the municipality. This study is aimed at evaluating the technology, characteristics, and management of stable waste primarily based on published statistics to supply sculptures from plastic waste material (bottles and polythene paper) as a way of handling plastic waste in Iganga Municipality (Domic, 2022).

1.2 Statement of the Problem

The accumulation of plastic debris in the environment is a global problem (USAID, 2004). International organisations (See, for example, Giz, 2010; United Nations, 2017; World Bank Group, 2018) have engaged in scientific endeavors aimed at eradicating its damaging impacts on the environment. As a result various interventions are currently in place aimed at plastic waste containment. The facts regarding the harmful effects of plastic waste and the accompanying plastic waste mitigation measures currently differ.

Studies (Sharma & Jain, 2020; Sharuddin, Abnisa, Daud, & Aroua, 2016; Van & Waltman, 2017; Wang, Yu, X., and Li, 2020) have emphasized the dangers that micro plastics pose to the marine environment. These have necessitated the need for developed nations to promote plastic waste recycling as an efficient method of managing plastic waste. As a result, they have placed a strong emphasis on keeping material prices in check using circular economics in plastic waste policies. Such tactics are expensive, unsustainable, and ultimately ineffective in developing nations like Uganda. Additionally, these measures do not emphasize community involvement and as such are not sustainable.

This study aimed at making a cost-effective community based intervention. Taking the case of Iganga municipality to close this gap the study adopted a network-focused method of improving plastic waste disposal within the municipality. The community was sensitized to collect and manipulate plastic waste for creation of sculptural forms using single use plastic waste. The plastic sculpture placed in strategic places for creating awareness to the community

1.3 Purpose of the Study

To explore how plastic waste (pet bottles and polythene bags) can be used to produce sculptural art forms to promote plastic waste mitigation.

1.4 Objectives of the Study

a) To assess the effectiveness of plastic waste management in Iganga Municipality.
b) To analyse the physical properties of plastic waste in Iganga Municipality.
c) To explore studio-based means of manipulating plastic waste for sculpture production
d) To produce prototype sculpture models from selected plastic waste in Iganga Municipality.

1.5 Research Questions

i) How effective is plastic waste management in Iganga Municipality?

ii) What are the physical properties of plastic waste in Iganga Municipality?

iii) How can plastic waste be manipulated for production of sculpture.

iv) What proto type sculptural models can be created from using plastic waste found in Iganga Municipality?

1.6 Significance of the study

The study educates the public on the risks to human health and the environment associated with improper plastic wastes disposal. It will raise awareness of these threats and suggest that artists should take preventative step in construction of real and practical sculptures of uteliterian or authentic value.

The study aids in educating and advising the Iganga Municipal Council on practical and affordable strategies for managing plastic waste.

The study makes decisions that can facilitate the management of plastic waste in Iganga Municipality and the nation at large by showing policymakers the value of art in the field of managing plastic trash.

Academically, the study will contribute to the body of knowledge and give researchers references, possibly inspiring more investigation.

1.7 Scope of the study

1.7.1 Geographical scope

The study was conducted in Iganga Municipality, it is in Iganga District Eastern part of Uganda, 230 Km from the capital Kampala. It has eight (8) sub-counties with urban local governments, these include Kigulu South, Kigulu North and Bulamogi. Iganga Municipality is located near Lake Victoria as a result it is endangered by the accumulated waste that lay

along the water shores. Plastics waste has been seen to block water passages causing stagnate water environment that led to breeding grounds for mosquitos.

1.7.2 Content Scope

This study has examined Iganga municipal environmental and implementation reports. The selection of Iganga municipality for this study draws from a November 2017, Monitor Publication report that cites Iganga among the districts with waste management challenges.

1.7.3 Time scope

The activities that related to this study were carried out between August 2018 and December 2020. However due to challenges of COVID 19 the study was extended up to 2022.

1.8 Conceptual Perspective

In this study, the researcher has gathered aspects plastic waste management supported by the literature. The literature identifies nine contemporary improvement bands (DB)s in place round the world, consequently the name (9DBs) conceptual framework'. The 9DBs framework is in effect as an international concept of waste and development: it offers a road map, allowing an overview of the 'massive photo', wherein does this every use, place or metropolis match into the general spectrum of waste and resource control (heat) sector improvement. although the level of heat development at anybody time regularly varies inside and between areas/towns, especially in Low- And Middle-Income Countries (LMIC)s, it is viable to perceive a 'centre of gravity' that correlates to at least one band. The evolution of warm structures over time, associated with economic and social development, can then be defined as a progression among DBs.

This examine adopts this conceptual attitude because it relates with the wider waste control device throughout international locations, area, and municipalities. The observe is geared toward setting up plastic waste as a cloth for sculpture and managing plastic waste through

experimenting with plastic material and generating status sculptures of various land and aquatic animals. All aimed at contributing in the direction of creating attention and decreasing the quantity of plastic waste inside the surroundings.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

An intricate issue caused by the excessive disposal of plastic waste in the environment and water sources is plastic pollution, (Earth Eclipse Staff, 2019). The issue has significant effects on the environment and public health. Since plastic pollution can be physically seen, this issue has drawn a lot of attention from international stakeholders, including scientists, policymakers, and notably the public and the media (Laura, 2019). Contrary to other contaminants in science history, this issue has received enormous attention, (EPA, 2022).

New paradigms and comprehensive viewpoints have arisen to assess, investigate, and manage the plastic waste problem because of the problem of plastic and micro plastic contamination receiving more attention. This chapter provides an analysis of the relevant literature that is entirely grounded in contemporary study. The in-depth parts go into greater detail on issues that many students have brought up (EPA, 2022).

2.1 Effectiveness of Plastic Waste Management

The overcrowding of cities and the careless disposal of waste plastics, according to Spiegelman (2007), contributed to the spread of infectious diseases like cholera and diarrhea that later posed a threat to the health of city residents.one of the essential demanding situations is that plastic has many precious uses, over the years ,we've got hooked to single use plastics. All over the world, a million consuming bottles are bought every minute while five trillion single use plastic luggage are used globally every year,(UN environmental program report, 2018) which led to public investment in municipal sanitation infrastructure, workforce, and resources for municipal waste collection and disposal at suggested locations (Spiegelman, 2007). Depending on whether the waste was dangerous or not, several waste management systems were developed.

It is an offense under Section 20d of the SWMO 2000 to scatter or litter solid waste on any private or public property, public street, roadsides, or in a ditch, river, stream, pond, channel, or in a park, excavation, or any other place where it may be or become a nuisance. However, the ordinance lacks the power to 'bite' despite the existence of the law enforcement officials. The policy also proposes a fee for solid waste to be borne by the generator of solid waste, yet it does not provide a mechanism of collecting these fees, which has made fees collection unrealistic, hence increasing the volume of solid waste generated in the municipality as a result of the growing urban population, concentration of industries in the towns poor behavior and consumption habits of residents and inappropriate waste management practices due to limited awareness provided by the ordinance (Nsibambi, 1992).

SWM methods fall under three categories: disposal, recycling avoidance, and reduction methods. Land fill and incineration are disposal methods, while recycling includes biological reprocessing, energy recovery, and salvage, and avoidance and reduction include incineration, re-use. The best way of combating the time-bomb of waste is by reducing waste generated in our homes by recycling, re-using, disposal, giving waste to people who need it, prepare and incineration of animal feeds such as those of dogs and pigs, banana and sweet potato peels can be fed to cows and goats, and old clothes and shoes can be given to the needy (Wicklief, 2008).

Metzger (2009) establishes that the awareness about proper handling of solid waste in countries such as Britain ushered in the modern "age of sanitation. However, in most of the developing world, attempts to create awareness about solid waste management are still weak due to an imbalance between the rate of population growth and awareness of solid waste management, and this has reduced the level of sanitation in cities. According to the UN Report (2014), like in the developed countries, population growth in urban areas is always on the increase, even in developing countries, and it is projected that by 2050, 66% of all people

in the world will be in urban areas. Projections show that urbanization combined with the overall growth of the world's population could add another 2.5 billion people to urban populations by 2050, with close to 90 percent of the increase concentrated in Asia and Africa (UN, 2014).

Generally, in Africa, while the population of numerous urban areas such as Accra, Kampala, and Lilongwe is growing rapidly, heaps of solid waste materials are littered throughout these cities (Martin, 2013). In most of these cities, awareness about proper SWM approaches is not obvious since they cannot even differentiate between reusable and non-reusable solid wastes.

In East African countries, notably Uganda, Tanzania, and some parts of Kenya, SWM practices have for a long time been centralized such that central authorities use trucks to collect waste from sources or transfer points and deliver it to designated solid waste dumps (Kiriaserie, 2010). However, solid waste is accumulating in cities in East Africa. In Tanzania, disposal is by way of crude dumping, and the current management system is based on the "end of the pipe" solution, i.e., collection-transportation–dumping out of the city boundaries in conformity with the "out of sight, out of mind philosophy" following a centralized systems approach with limited recycling and resource recovery (Adebayo & Kabbashi, 2016).

Local governments are usually charged with the responsibility of managing solid waste, and most local government laws give local governments exclusive ownership over waste once it has been placed outside a home or establishment for collection (World Bank, 2009).

According to the World Bank, community participation in collection, community consultation on cost recovery, and public participation in facility sighting and design are all inherently necessary for the successful development of any solid waste project. This means that the World Bank recommends involvement of the public in solid waste management, a call that Ordinance 2000 seems to provide for. Section 4 of Ordinance 2000 makes every owner or

occupant of dwelling or commercial premises responsible for waste generated at those premises until it is collected by the Council, its appointed agents, or operators licensed by the Council (Azabou & Nurgent, 2008).

According to Kassie (2016), a significant component in any waste management plan is public environmental awareness and participation in addition to appropriate legislation, strong technical sustainability, and adequate funding. Hsiao (2014), cited in Kassie (2016), explained that solid waste is because of human activities and everyone needs to have a proper understanding of solid waste management practices without which the success of even the best conceived solid waste management plan becomes questionable.

In LaGrega, Buckingham, and Evans (2010), they noticed that though the characteristics of the solid waste and its constituents in most cases determine the type of littering method that can be applied, there is improper littering in some markets resulting from the fact that solid waste is generated from many sources, such as agricultural produce, domestic, trade, and many others.

2.2 Physical Properties of Plastic Waste Damped

Vallero (2011) notices that before categorizing wastes as hazardous or non-hazardous, they were all managed by dumping them onto land or water. Hickman (2009) stresses that at the time, every developed country condoned the existence of open and unregulated disposal sites, without considering them as potential threats to public health. However, in 1969, authorities started acknowledging the dangers of solid waste to human health, which led to the enactment of the first comprehensive SWM legislation in Washington, United States of America, noted in the Co-op Vetos parking decision (Hickman, 2009). This law provides for the reuse of some solid wastes and the burning or having proper disposal methods of disposal. Research continues to show that after the enactment of the SWM legislation, laws and regulations in different countries changed a great deal to address the evolution in awareness about the

proper handling of solid waste and the proper construction, monitoring, and closure of landfills in other countries(Agarwal, Mona, & Jayveer, 2015).

Re-usable versus disposable: - Urban households are more exposed to the "disposable economy", which is cheap products meant to be used once or twice and then thrown away. This translates into more money for companies since you have to keep buying their things, and therefore more landfills. Mogan (2001) advises use of cloth napkins instead of paper, cloth diapers instead of disposables, metal and certain clinic ware instead of plastic and paper, as super markets have them with re-usable carry bags, re-chargeable batteries and re-usable jam bars. This is an idea that, once borrowed, can reduce the accumulation of waste common among the rich (Bortone, 1995).

Biological processing: The waste materials that are organic in nature, such as plant materials, food leftovers, and paper products, can be recycled using biological compositing and digestive processes to decompose the organic matter. The resulting organic materials are then recycled as mulch or compost for agricultural or land scarping purposes (Elizabeth, 2006).

Urban centres in Uganda produce plastic waste that covers bottles, toothbrushes, basins, budgets, jerry cans, plastic disposable cups, plates, and spoons. Other kinds consist of detergent bucket containers and water boxes (OAG record, 2010). Of the full waste accrued inside city centres, less than half (1,500 heaps) per day is dumped in landfills in the surroundings. In Ugandan urban centres, throwing plastic waste into landfills is the most popular method of plastic waste disposal. This technique of waste disposal focuses attention on burying the waste in the land. There's a method used that removes the odors and dangers of waste before it is positioned into the ground. Many advanced economies have reconsidered the use of landfills because they give upward thrust to air and water pollutants, which critically impacts the surroundings and may prove fatal to the lives of humans and animals (Babayemi, et al., 2019).

Burning, reusing, and recycling plastic materials are other common plastic waste disposal strategies. The above-noted techniques are accomplished for precise use together with the processing of plastic waste to extract or recover substances and assets or convert them to power in the form of useable warmth, strength, or gasoline. Recycling entails the method of converting plastic waste merchandise into new products. Recycling is the 1/3 factor of the Reduce, Reuse, and Recycle waste hierarchy. The concept behind recycling is to reduce electricity utilization, reduce the quantity of landfills, lessen air and water pollution, reduce greenhouse gas emissions, and maintain herbal assets for future use (EMF, 2017). On the 18th of January 2020, a crew from Takataka Plastics visited Recycling Enterprise (PRI), one of the largest processing floras in Uganda. They set up that on the plant, plastic is turned into transformed into flakes which are sold to overseas nations. The flakes have been then used to manufacture merchandise like polyester fibres, cloth for manufacturing of clothes, pillows, carpets, and polyester sheets. China is currently the world's most important market for plastic flakes. In the case of Uganda, China and India have closed doors to the importation of Ugandan flakes.

2.3 Feasibility of Creating Sculptures from Plastic Waste

Plastic has numerous precise attributes that make it a beneficial material. It's far from transparent, bendy, and immune to water. It's also immune to strength and mild weight. It has the potential to be molded into distinct sizes. Plastics can mimic fibres from the herbal world, such as cotton, silk, wool, porcelain, and other artificial materials, including clear sheets and flexible films (Domic, 2022). Plastics are also resistant to chemical substances, so they no longer corrode. Plastics are an excellent material for packaging. They are each a thermal and electric insulator. They do not now transfer warmth or strength. In the end, plastic is regularly used to fabricate kitchen wear (Auler, 2014).

The gravity of plastic is the ratio of the burden of the weighed pattern to the load of the same extent of water at a certain temperature; the unit is g/cm3, and the liquid buoyancy method is normally used as a dimension method (Anna et al., 2021). Absorption of water: The water absorption of plastic refers to the amount of water absorbed after a sample of a certain length is immersed in distilled water at a certain temperature for 24 hours. The scale and shape of the water could be suffering from the absorption of water, and the water absorption price is expressed by way of weight. That is regularly expressed in % (Anna et al., 2021).

Breathability: permeability refers to the extent of gas permeated via a plastic film of a certain thickness in a space of one rectangular meter underneath an atmospheric stress in 24 hours. Permeability is related to the thickness, region, time and temperature of the skinny wax and air stress difference (Awuchi, 2017).

Jamberk (2017) reveals that the costs related to secure plastic waste management are a challenge to many municipalities. Related economic costs include the ones connected to easy-up operations and clutter removal. Similarly, to the challenges referred to above, unsafe plastic waste management causes harm to the fishing gadgets, leading to a lack of revenue. It's been reported that bad waste control practices have caused terrible and low-quality fish in Iganga municipality. Because communities within the municipality live around the lake regions, earnings have substantially decreased because of the demanding situations supplied by lake plastic pollutants.

2.4 Prototype for Sculptures

Art has been used for a long time as a powerful creative tool for political and social activism. With plastic pollution and climate change at the leading edge of all and sundry's minds, it's of no surprise that artists are beginning to think of innovative strategies to fix this undertaking. Via art for social change tasks, effective art works are being made to serve as a

stark reminder of the impact of waste on the planet and its inhabitants. The waste is getting used to encourage communities to rethink intake and exchange behaviour (Kelly, 2019).

Artwork crafted from recycled waste is powerful in communicating this message. It may respond to the environmental name by remodeling regular waste gadgets into valuable paintings. Plastic waste has been seen to be used as an alternative and reasonably-priced uncooked material that leads to the production of creative art. Artists have answered the reuse, reduce, and recycle call by locating modern ways to show their concern for the surroundings. Artists have been seen using recycled or reused gadgets to make attractive pieces of modern art, Al-Banna (2019). Eco-artists are repurposing antique, recycled, and reused objects into superb pieces of present-day artwork. Fashion rose to prominence in the 1980s, as museums and galleries in Western Europe opened their doors to such innovation and creativity. With waste disposal posing a severe environmental challenge, it's widely anticipated that such projects will spur governments to take concrete steps aimed toward removing this worldwide challenge (Salwa, 2019).

Educational institutions have additionally been seen to develop such projects. The graphic design college at Sharjah, better faculties of generation, stresses the significance of the usage of art and recycling in the curriculum, Salwa (2019). The prospectus states that installation art is right for the environment as it takes ordinary objects and transforms them into treasured art works. That is because using raw or new substances may be luxurious and people are limited in what they should purchase. The Sharjah higher faculties of media students are endorsed to use recycled objects like fabric leftovers, wood, and paper to create collages and different inspirational artworks.

As a more collective solution, sports that raise awareness about plastic waste control aim to change environmental attitudes and inspire seasoned environmental behaviors on a larger scale. Regulations (bans, levies, see above), statistics campaigns, instructional programs,

point-of-sale interventions (e.g., asking clients if they want plastic bags rather than handing them out), and participation in easy-up activities are all examples of behavior change interventions (Heidbreder, 2019; Pahl, 2020). Importantly, Pa(2020) notes that it "is advisable to build on private and social norms and values, as this could cause spillover into different pro-environmental domains and behaviors." This is going in step with the concept that recognition of plastic pollution is a gateway to wider pro-environmental attitudes (Ives, 2017).

This looks at many of the several opportunity strategies that have been superior toward eliminating plastic waste pollution. It advocates for creative solutions to the plastics crisis. Do your personal "making" with waste plastic materials. Nothing beats trying to make waste into something new to assist human beings in figuring out the potential of various plastics. Whether it’s making models, junk modelling, making works of art, or hands-on work which allows human beings to examine, all of them work towards collection, reusing, recycling, and overall eradicating plastic waste from the environment.

2.5 Literature Summary

Uganda Plastic Manufacturers and recyclers Association is aimed at sensitizing the masses about proper waste disposal particularly plastic.(UPMRA 2019) .Overcrowding of cities and careless disposal of plastics waste contributed to the spread of infectious diseases like cholera and diarrhea that later posed a threat to the health of city residents. It is an offense under Section 20d of the SWMO 2000 to scatter or litter solid waste on any private or public property, public street, roadsides, or in a ditch, river, stream, pond, or channel. There is an imbalance between the rate of population growth and awareness of solid waste management (SWM) in developing countries. In Africa, for example, solid waste is accumulating in cities such as Accra, Kampala, and Lilongwe. In Tanzania, disposal is by way of crude dumping, and the current management system is based on the "end of the pipe" solution. In some East

African countries, notably Uganda, Tanzania, and some parts of Kenya, SWM practices have been centralized. Azabou and Nurgent (2008). According to Kassie (2016), a significant component of any waste management plan is public environmental awareness and participation. This is in addition to appropriate legislation, strong technical sustainability, and adequate funding.

Urban households are more exposed to the "disposable economy," which is comprised of cheap products meant to be used once or twice and then thrown away. Mogan (2001) advises the use of cloth napkins instead of paper, cloth diapers instead of disposables, metal, and certain clinic ware instead of plastic and paper. Organic waste materials such as plant materials, food leftovers, and paper products can be recycled using biological compositing and digestive processes to decompose the organic matter. Ugandan urban centres produce plastic waste that covers bottles, toothbrushes, basins, budgets, jerry cans, plastic disposable cups, plates, and spoons. Of the full waste accrued inside city centres, less than half (1,500 heaps) per day is dumped in landfills in the surroundings. There's a method used that removes the odors and dangers of waste before it is positioned into the ground.

Plastics are an excellent material for packaging and are both thermal and electric insulators. The water absorption of plastic refers to the amount of water absorbed after a sample of a certain length is immersed in distilled water at a certain temperature for 24 hours. It's been reported that bad waste control practices have caused terrible and low-quality fish in Iganga municipality.

Eco-artists are repurposing antique, recycled, and reused objects into superb pieces of present-day artwork. Plastic waste has been used as an alternative and reasonably-priced uncooked material that leads to the production of creative art. The waste is getting used to encourage communities to rethink intake and exchange behaviour. Sports are a great way to raise awareness about plastic waste control and inspire seasoned environmental behaviors on

a larger scale. Recognizing plastic pollution is a gateway to wider pro-environmental attitudes (Ives, 2017). This looks at many of the several opportunity strategies that have been superior toward eliminating plastic waste pollution.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

Chapter 3 elaborates on the general systematic movement plan of investigation. It includes the study design, location and population research, pattern populace and selection, sampling strategy, data collection method, and data collection strategies. The researcher additionally presents strategies observed in the exploration of plastic waste fabric through studio exploration sports.

3.1 Research Design

Claybaugh (2020) defines research design as the overall strategy utilized to carry out research that defines a succinct and logical plan to tackle established research questions through the collection, interpretation, analysis, and discussion of data. This observer used both qualitative and practical-based sculptural strategies. The look was created to generate records on substances derived from specific plastic waste. The researcher used qualitative processes of gathering statistics to discover reasons, mindsets, and behavioral patterns that inform precise picks made. The method enabled the researcher to gain human beings' perceptions and well-known attitudes toward the usage of plastic waste as a material for sculpture.

3.2 Study Area

The study was conducted in Iganga municipality, one of the first growing municipalities in the Uganda. Iganga is characterized by a primary growing population. Its population was predicted at 39500 in 2002, whilst the latest Uganda Bureau of Data (UBOS) file places the contemporary populace at 51000. The vicinity is close to Lake Victoria and, as such, is laid low with lake-face plastic pollutants. This study area was identified due to dumping of waste everywhere in the environment.

3.3 Target Population

The study targeted families and all users of plastic objects inside Iganga municipality. The sample population was obtained after identifying the number of households in area of study. These are people who are directly involved in daily use of waste plastics. Utilized plastic waste such as plastic bottles, plastic bottle tops, bottle seals, polythene carrie bags and straws for the study. That plastic bottle waste and carrier bag (Kavera) was chosen because it is currently the most commonplace plastic waste dumped and disposed off at a typical household level.

3.4 Sample size

During the exercise, 73 different household interviews were done and sample size was determined using Krejcie and Morgan (1970) sample size determination table. A standard expertise in the topic at hand, 14 respondents were chosen as key informants. The important respondents were able to provide pertinent information about the municipality's handling of plastic garbage. Leaders of market sellers, municipal officials, NEMA officials, garbage collectors, and political figures were among the major informants.

3.5 Sampling Strategy

Purposive sampling was used in conjunction with the snowballing technique as part of the sample strategy. To select respondents for the household man or woman interviews, the snowball sampling technique is used. In qualitative research, a strategy known as deliberate sampling is frequently used to identify and choose data-rich cases for the most efficient use of limited sources. Patton(2002). According to Creswell (2011), this entails locating and choosing individuals—or groups of individuals—who have specialized knowledge of or experience with a topic of interest. Key informants were also purposefully chosen among municipal stakeholders who knew about and understood the field of research (Creswell & Clerk, 2011).

The necessity of availability, willingness to participate, and the ability to speak views and opinions in an eloquent, expressive, and reflective manner are points made in this research. Leaders of market companies, municipal authorities, NEMA officials, and political figures who should represent the population were chosen as key informants for the study, whereas creditors were chosen at random using a basic random approach.

Table 1: Showing the Breakdown of Samples

Category of respondents	**Population**	**Sample Size**	**Sampling technique**
Individual household	90	73	Snow balling technique
Leaders of Market Vendors	10	10	Purposive sampling
Municipality officials	05	2	Purposive sampling
NEMA Officials	09	3	Purposive sampling
Waste collectors	16	2	Simple random sampling
Political leaders	04	2	Purposive sampling
Total	**135**	**92**	

3.6 Data collection Methods

The researcher used the questionnaire, key interview, photography and observation. The researcher carried out interviews on the above respondents, transcribed the interviews, reviewed the documents, and used observation to collect data which was later interpreted in the studio through several experimentations to answer objective one to three of the study which was to assess the effectiveness of waste management in Iganga municipality, to analyse the properties of plastic waste dumped in Iganga municipality, and to explore on how plastic waste can be manipulated into sculptural forms.

3.7.1 Questionnaire

The self-administered open-ended questions were administered on selected households. Overall, 73 individual household interviews were conducted during the data collection exercise. This was in answer to the first objective and the first question intended to assess the effectiveness of waste management in Iganga municipality. The questionnaire was developed and administered to selected respondents in the respective sampled zones in the municipality. Households were then stratified according to the different areas that make up the zones.

3.7.2 Key informant Interviews

A total of 14 key informant interviews were conducted with selected leaders from market vendors, municipality officials, NEMA officials, waste collectors, and political leaders were interviewed because they had vital information regarding the study. This tool was intended to answer questions one and three as directly associated with objective one and two respectively. The use of interviews assisted the researcher in minimizing subjectivity associated with questionnaire responses. In addition, the interview schedule allowed respondents to talk about the subject matter deeply since it was a one-on-one interview.

3.7.3 Observation

Key observable aspects of the study were taken into consideration. Of great interest were the methods of waste collection in the municipality, types of plastics that were dumped and logged on the lake shores, level of involvement of the local government. This tool was aimed at investigating objective one and two respectively intended to find out the levels of community waste management sensitization within the household, and the alternative plastic waste management prospects (if any).

3.7.4 Document Review

Secondary data was gathered through reviews of existing data in the reports of other municipal libraries. From the review of related literature the researcher was able to answer research questions 3 and 4 on what other people have done on manipulation of plastic waste into artistic forms as a way of mitigating plastic waste. Reports reviewed included those of Iganga municipal, Kampala City Council (KCCA) - served as a capital city benchmark and NEMA. This ensured that the study objectives were captured comprehensively.

3.8 Studio Experiments and Exhibitions

The researcher looked at the plastic waste bottle and its characteristics. In addition, he examined and identified qualities that enabled plastic bottle waste to be used to produce sculptural artwork of aesthetic and utilitarian value. Experiments were carried out on different components of a plastic bottle to test their inability and flexibility in the production of sculptural work. The sculptures made were related to the effect of plastic waste on animals, both aquatic and those that live on land. All were aimed at raising awareness on the environmental impact of plastic waste, with a particular focus on Lake Victoria and Iganga Municipality, the host community closest to the lake.

3.9 Procedure for Data Collection

The researcher sought permission from Kyambogo University Faculty of Vocational Studies to collect data from selected respondents through an introductory letter addressed to the Town Clerk, Iganga Municipal Council. With full permission to continue with the exercise, the researcher approached the heads of departments, who guided him to find the respondents. A meeting was scheduled and held at a time convenient for them. Household interviews were held with the heads of the households. The research team using snowball would move from one house to another and request to hold the interview. The acceptable interviewee would then direct the researcher to the next potential respondent.

3.10 Data Analysis

Analysis of qualitative data started in the field through visualization and attribution. After fieldwork, content analysis was used to generate and summarize qualitative data into major themes. The themes were derived from the research objectives. Where appropriate, voices of the respondents were captured and the verbatim used to support some of the key findings and field report writing. However, the specific identifiers such as name were "hidden" in compliance with the confidentiality clause in Uganda's ethical conduct in performing research.

3.11 Ethical Considerations

The main ethical issues considered in this study were physical and psychological harm, deception, informed consent, and privacy. Confidentiality was considered to protect the respondents' or participants' privacy. Respondents/participants were assured that the study is solely for academic purposes, and the self-administered questionnaires were purposefully anonymous. Consequently, participants/respondents were given a provision for informed consent. Participation in the study was voluntary, and if for any reason, the participants want to withdraw, they can do so. Anonymity was maintained by not asking the respondents not to write their names on the questionnaires. There is no known physical or psychological harm to the respondents by participating in this study.

Respect and dignity was taken into consideration when setting the questionnaires. All respondents and participants were accorded equal treatment to enable each of them to participate willingly without bias and unrealistic expectations. In addition, all researchers, and scholars whose work was referred to in this study was quoted, acknowledged, and cited accordingly. The researcher ensured that findings are reported with exactness to avoid the fabrication of information through the presentation of fraudulent results.

3.12 Safety Precautions

During collection of data and manipulation of plastics, a lot of care was taken to avoid pollution and infections caused by dirty plastic materials. The researcher always wore an overcoat, gloves and a face mask since this was a COVID-19 pandemic period. Washing hands was the order of the day to avoid infections from dirty plastic waste.

The plastic waste collected were placed in a birth of Jik detergent for one day before cleaning them so as to disinfect them and placed in sunshine to dry before use.

CHAPTER FOUR: PRESENTATION AND DISCUSSION OF FINDINGS

4.0 Introduction

This chapter presents and discusses the findings of the study. It, in addition, presents a studio artistic experience. The study was guided by four objectives, which were i) to determine the effectiveness of the management of plastic waste in Iganga Municipality; (ii) to analyse the physical properties of plastic waste damped in Iganga Municipality; (iii) to experiment through studio means the possibility of using plastic waste for sculpture production; and (iv) to produce prototypes of sculptures from selected plastic waste in Iganga Municipality.

The chapter explored the dangers of waste plastic material to aquatic, land, and human beings through different themes, namely, the fish, the octopus, the bird, and the crocodile. These themes were created from collected waste plastics, that is, bottles and *Kavera* that are poorly disposed on the streets of Iganga municipality to create awareness of the dangers of these waste plastics. The researcher used bottles and polythene bags commonly called "*Kavera.* These plastics are selected because they are abundantly available at any household level. In addition, Kavera is flexible and, as such, easy to manipulate in the production of sculptures.

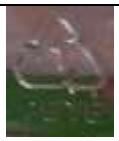
Through studio experimentation, these themes were creatively developed into sculptures which were later installed in different strategic places such as Bishop Willis core primary teachers' college (CPTC), Busoga University, Igamba trading centre, and Kasokoso primary school in Iganga municipality. The intention was to sensitize the community about the dangers of poor disposal of plastic waste and to present art as one of the ways through which plastic waste can be recycled, reused, and utilized. The above-mentioned places (sites) were selected for the sculpture installation because they are highly populated and surrounded by collections of plastic waste.

4.1 Determining the Effectiveness Plastic Waste Management in Iganga Municipality.

The studies promoted the use of plastic scraps as sculptural fabric. The investigations went through a process of picking the right kind of solid waste to experiment with. The observer established that Iganga Municipality has a variety of plastic trash categories that would be used in a number of tests. These included plastic bags among other things, as well as wrappers, boxes and bottles, furniture, appliances, cutlery, shoes, even baby wipes and tea bags. The researcher researched specific waste materials inside the studio and later profited on Kavera and bottles due to their abundance, ability to soak up an additional percent of all plastic waste in the environment, and reliable flexibility in sculpture production.

The researcher found that the way stable waste is disposed of influences the surroundings. Plastic waste is a difficult component of urban solid waste. As it is non-biodegradable, it may live in the surroundings for a longer time, inflicting extreme environmental degradation. Environmental degradation could doubtlessly harm human and organic wealth.

Table 2: Categories of plastic waste disposed of in Iganga Municipality

Symbol	Acronyms	Full name	Use
	PET	Polyethylene terephthalate	It is used for fizzy drink bottles and frozen ready meal packages
	HDPE	High density polyethylene	Used for milk and washing up liquid bottles
	PVC	Polyvinyl chloride	Used for food trays, cling firms, bottles for squash mineral water and shampoo.

	LDPE	Low density polythene	Used for carriers and bean carriers
	PP	Polythene	Used for margarine tubs and microwavable trays
	PS	Polystyrene	Used for yoghurt pots, form meat or fish trays, cartons, cutlery.

The figures in the table above were collected by the researcher from various collection centers and streets in Iganga Municipality. It shows the various scientific classifications of plastics. The triangular symbol with the arrows indicates that the material can be recycled. The study established that PET and LDPE make up the greatest percentage of plastics disposed of in Iganga Municipality. As a result of the general increase in the problem of plastic waste management, it has escalated to an alarming level in Iganga municipality and Uganda in general.

According to the findings, Iganga municipality officers are similarly responsible for ensuring proper disposal of solid waste and accumulating within the municipal, but this is inadequately completed due to diverse and demanding situations such as budget. Consistent with the municipality counsellor Kalemba (2020), budgets are performed but budgets are not released as budgeted. Investment for waste control activities is primarily based on nearby revenue at the time. If it isn't launched for this reason, it takes a long time to gather waste. A few traditional practices of waste management are still applied, not like in the other metropolis

councils, like in Mbale, in which recycling is one of the key strategies that management is focusing on to reduce challenges of waste management.

Consistent with Mawazi, a manager at one of the collections centres for plastic waste in the municipality, officers do not offer any assistance to the creditors; alternatively, they demand bribes to allow the collectors to use the venue. Furthermore, the municipal council rarely ventured into learning about good practices in the control of plastic waste, which lacked approved gazetted waste disposal locations. All this, blended with a restricted group of workers' workforces and a good fortune of know-how for plastic waste control, implies that during most instances, waste is amassed after a long period of time, which creates a deficiency in the effectiveness of waste plastic control practices. The collection and disposal of plastic waste have been poor in the examined region, consistent with the researcher's observations.

4.2 Turning plastic waste into sculptural material

The amount of plastic waste in Iganga Municipality is mainly plastic bottles, scientifically referred to as PET. According to the state of environmental report for Uganda (2006), population increase and poor industrial practices, inefficient water use and pollution of rivers and lakes, including wetlands, pose a threat to the water system and the general environment. To use waste plastic as a material for sculpture, the researcher had to go through activities as elaborated below:

The researcher underwent a process of selecting the type of plastic waste needed for experimentation. However, it should be noted that this took some good time because some of the plastics like Kavera found were in bad condition (tone), others were covered in other waste and in dust, so they couldn't go through the experiments. Therefore, the researcher

chose to go on the streets and public places, picking up the recently disposed bottles and Kavera (pp) polythene, as shown in Figure 1.

Figure 2: The degradable and non-biodegradable waste dumped together

Figure 3: Researcher picking plastic waste from the street

Source: Researcher Photo.

Figure 4: Children removing bottle top seals from sorted waste plastic bottles.

Source: Researcher Photo

The researcher discovered that when filthy plastics are dumped outside in the sun for an extended period, gases are produced that engulf nearby residents and may spread diseases like cancer and stomach distress. These plastic wastes are also mosquito breeding grounds because of the water that has accumulated in the bottles.

From among the numerous plastics that can be discovered in the Iganga municipality—including on the streets, in public spaces, and at waste sites—the researcher decided to use two for this study: PET bottles and Kavera. These plastic bits could be easily assembled to provide pleasing aesthetic effects and were commonly available. By creating sculptures out of used bottles and Kavera, the researcher hoped to establish alternative methods of reducing the amount of plastic waste that is improperly disposed of in the Iganga municipality and to demonstrate to the public how waste can be used for both aesthetic and financial benefits.

Figure 5: Dumping site in Kasokoso, Iganga Municipality.

Source: Researcher Photo

4.3 The process of studio experimentations with plastic waste as a material for sculpture

Figure 6: Washing waste bottles to remove dirt.

Researcher Photo

Figure 7: **Cutting plastic bottles**

Source: Researcher Photo

Figure 5 above shows the researcher trying to wash soil out of the bottles as a way of preparing them for sculptures. This was done to have the original colour of the bottles. This color inspired the researcher to use them because of their appearance truly glows. See figure 4.3 above, which illustrates the colour concept.

Figure 8: Ironing of plastic bottle cuts

Source: Researcher Photo

The ironing of the material was intended to flatten the surface of plastic material and bring out the desired texture, which makes it easy to patch various pies of plastic together. In relation to the texture of the source of inspiration (fish), plastics also produce a beautiful surface texture when a medium amount of heat is applied to them, as shown in figure 7 above. The researcher ironed the bottle cuts to make them flat to lie very well on the metal frames and give an artistic impression on the sculpture.

Figure 9: Piercing flattened plastic bottle using a soldering iron

Source: Researcher Photo

Figure 4.8 above shows a researcher using a hot electric soldering iron to make holes for easy sawing of plastic flattened plastic bottles onto the metallic frame. However, the researcher had to use strong protective gear to protect himself from the fumes coming out of the burning plastic.

Figure 10: Patching flattened plastics

Source: Researcher Photo

The source of inspiration

Tilapia are shaped much like sunfish or crappie but can be easily identified by the interrupted lateral line characteristic of the Cichlid family of fishes. They are laterally compressed and deep-bodied, with long dorsal fins. The forward portion of the dorsal fin is heavily spined. Spines are also found in the pelvis and anal fins. There are usually wide vertical bars down the sides of fries. Theme One: Fish in Popma (1999).

Figure 11: Tilapia fish (source of inspiration)

Source: Popma 1999

The fish inspired the researcher because it is a common source of food for the people of Iganga municipality. The various body parts of tilapia fish also inspired the researcher to use them as they can easily be manipulated into different shapes for the sculpture. From studying the source of inspiration, the researcher realized that fish are one of the aquatic life suffering from waste deposited by running water into the lake. Iganga municipality is next to Lake Victoria. Therefore, these animals face the danger of waste deposited in the municipality.

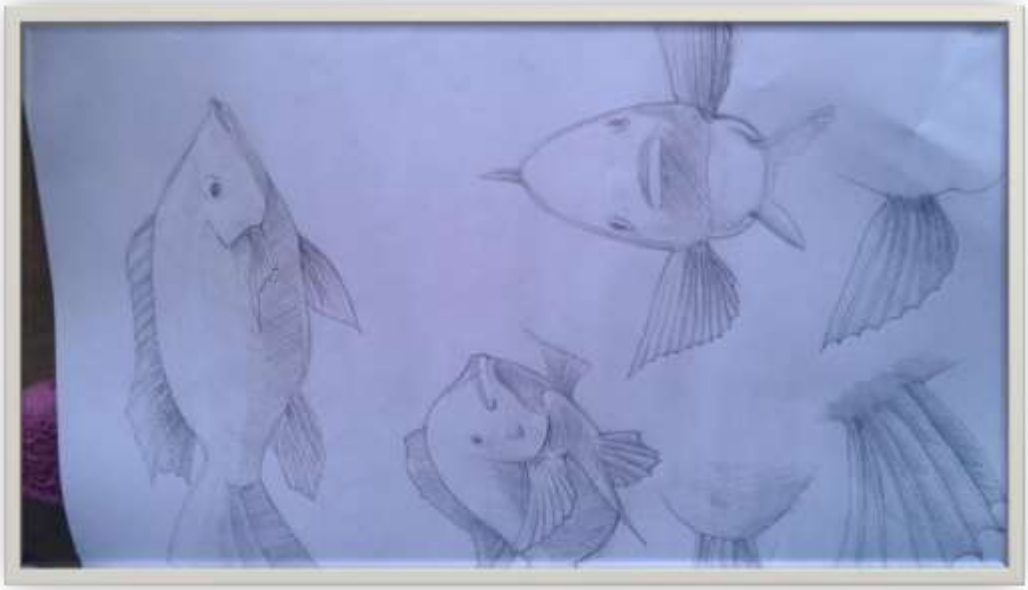


Figure 12: Studies of tilapia fish in pencil on paper.

Source: Researcher

The fins of the fish when spread out look beautiful and attractive, but they can be dangerous when needed for protection. Likewise, the plastic bottles look beautiful in their various transparent colours, but they are similarly dangerous when they are poorly disposed of in the environment. The researcher was inspired to produce sculptures that can be placed on the beach to show people the dangers of poorly deposed waste and, at the same time, functional sculptures as shown in the figure below.

Figure 13: A drawing of a beach bed derived from fish fins.

Source: Researcher

Figure 14: A prototype beach bed

Source: Researcher Photo

The researcher used smaller iron bars and biding rings in welding a frame for the beach bed and lampshades because these were found to be very flexible and easy to fabricate into the desired shapes. Measurements of biding rings were taken before cutting to produce a definite size of the structure. The leg stands of the beach bed and the top shade were made to look like fish fins, which are the source of inspiration as shown in figure 13 above.

To achieve the purpose of the study, which was to produce sculptures from plastic waste material (bottles and polythene paper) as a way of managing waste in Iganga municipality, the researcher made lamp shades using biding rings in the form of fish tails. The fish tail is beautifully shaped when seen and looks like a blooming flower. The frames were welded in a curved way that could protect the inside bulb and, later, it was dressed up with transparent flattened plastic bottle sheets of different colours See figure 14 These could reflect beautiful light rays into the surrounding environment. The researcher hoped that this would raise community awareness of an alternative way to use plastic rather than dumping it anywhere in the environment where it could harm living organisms.

Figure 15: A lamp shade and a Beach Bed

Source: Researcher Photo

Figure 16: Applying finishing touches on the lampshade

Source: Researcher Photo

Ropes made from bottle seals were used to create a beautiful finish on the boarder of the lamp shade as shown in the figure 15. The ropes were interlaced in similar colours to those in the lampshade to bring out the monochromatic feel in the composition. The researcher went ahead to manipulate bottle seals to come out with various designs as below.

Figure 17: A door mat and table mat manipulated from bottle top seals

Source: Researcher Photo

The research established that bottle seals can be used to produce multiple products, even beyond sculptures. In the above figures, the researcher assembled a rope made from plastic bottle seals in coil form to form a decorative circular sculptural piece that could be used to cover surfaces. The sculptural piece could be used as a table mat, door mat, or wall hanging. The design could also be referred to by other researchers to manipulate them for further experimentation.

Another manipulation with bottle top seals produced a very strong material that can be used for future experiments. A number of experiments were carried out using four types of plastic waste material to explore how these materials could be turned into sculptures. These materials included plastic bottles (PET), bottle tops, bottle top seals, and polythene bags (kavera). Due to the esthetic value of colour and shape, plastic bottle tops were established as a material for surface enhancement. Using a smoldering gun to pierce holes in the bottle tops and binding them with wire gauze or gluing them onto the surface using wood glue.

Figure 18: Plastic bottles (PET), polythene bags and (Kavera) bottles top).

Source: Researcher Photo

Modification techniques of weaving with plastic wires from bidding with adhesive materials were achieved in consultation with another artist who once used the same material. In order to achieve objective four of the study, which was to produce a prototype of sculptures from selected plastic waste in Iganga Municipality, The researcher went on and explored with various sculptures, looking at some other animals that are equally endangered by plastics that are poorly disposed of. This was done in themes using bottles and Kavera, in addition to theme one, the fish, bird, crocodile, and octopus. The production of these sculptures also went through a similar process that included collecting of the materials for experimentation, cleaning of the collected materials, cutting to get flat surfaces and trimming of the material, welding of frames, piercing to get holes for sawing and sewing (interlacing) plastic bottle sheets using metallic or plastic wires onto the frame, as shown in the following figures below:

Theme two; the octopus

The Octopus has eight arms, each with two rows of suckers; no shell, either inside or out; and three hearts: one for circulating blood throughout the body and two to pass blood over the gills to oxygenate it. An octopus's bag-shaped body, or mantle, contains organs such as kidneys, a liver, gills, a stomach, an intestine, a brain, and reproductive organs. On top of its head, an octopus has two eyes that are structurally like human eyes. It has relatively good

eyesight, Mather (2019). During manipulation of bottle top seals, the researcher realized the likeness of octopus tentacles with the ropes from top seals joined together. They behaved like a chain, which made them easy to manipulate into the legs of an octopus. The legs were made to move in any direction.

Figure 19: An octopus

Source: James MacDonald, 2019

a

b

c

Figure 20: Sketches of different views of an octopus (a, b and c).

Source: Researcher

Figure 21: Prototype sculpture of an octopus made from bottle top seal ropes.

Source: Researcher Photo

Figure 20 the studio discovered a way to execute the octopus out of plastic waste and ropes made from plastic bottle top seals.

Having tried to use various materials like wood glue, super glue, and hard board in executing the octopus, I discovered that plastic threads are the best material for bidding either bottle tops or plastic bottles together. The harmonious arrangement of these various coloured materials created a consistent visual concept. The physical proprieties of plastics are equally reflective of the aesthetic value of the portrayed sculpture. The use of various ropes spread out as tentacles portrayed the void.

a *b*

Figure 22: The octopus with bottle tops and bottle seals ropes (a and b)

Source: Researcher Photo

Figure 23: Sewing the plastic sheet onto the flame

Source: Researcher Photo

Figure 24: An octopus under construction

Source: Researcher Photo

The figure above shows the octopus with tentacles on which light shade are attached

Table 3: List of major tools used in production of sculptures

Tool	**Usage**
Smouldering gun 	The smouldering gun was used to extract holes in both plastic bottles and bottle top seals which was done on primary stages during preparation of materials.
Ironing box 	For flattening the plastic surfaces and creating textures
Pair of scissors 	Cutting the bottles and trimming

Heat gun 	Spreading and attaching polythene bags *(Kavera*) on a frame
Welding gun 	Welding frames of the animals used in the study

Theme three: The bird

Figure 25: Showing a preying bird that often ingest micro plastic waste

The researcher thought of a predator bird (an eagle) that feeds on other small birds that feed on leftovers that are usually dumped in the environment. During the process of feeding, it engulfs microplastic material attached to its food.

Initially, the idea of a bird came when I was doing a lamp shade which was created from a source of inspiration, the fish (fish fin). During that process, the part of the lampshade looked like a bird's wing. This gave me an idea of creating something more artistic from the

lampshade. Further, I thought of turning the two parts of a lampshade, which came out to look like birds' wings, where I joined the leg and a head to create a sculptural piece.

a

b

c

d

Figure 26: Sketches of different views of the bird (a, b, c and d).

Source: Researcher Photo

Figure 27: Prototype of a bird

Source: Researcher Photo

The prototype of a bird was developed with wings spread out similar to the fins of a fish developed from manipulated I from lump shades.

Figure 28: The sculptural of a bird

Source: Researcher Photo

Theme four: the crocodile

Crocodiles have powerful jaws with many conical teeth. They share their unique body forms that allow the eyes, ears, and nostrils to be above the water surface while most of the animals are hidden, and the characteristics of crocodiles are like those of alligators. Both crocodiles and alligators are semi-aquatic animals and dwell in mashes and rivers. However, both are affected by plastic waste during the process of feeding. They engulf small pieces of plastic that can easily kill them. Hence, they are endangered species.

Figure 29: The crocodile

Source: iStock

a **b** **c**

Figure 30: Sketches of a crocodile (a, b and c)

Source: Researcher Photo

Figure 31: Welded crocodile frame

Source: Researcher Photo

Figure 32: Welding crocodile frame and fixing kavera on the crocodile frame using a heat gun

Source: Researcher Photo

Figure 33: The sculpture of a crocodile head out of water

Source: Researcher Photo

Figure 34: The sculpture of a crocodile head out of water depicting engulfing plastic waste.

Source: Researcher Photo

A crocodile has powerful jaws with many conical teeth. It shares its unique body form that allows the eyes, ears, and nostrils to be above the water surface while most of the animal is hidden below. Crocodiles' characteristics are like alligators. Both crocodiles are semi-aquatic

animals and dwell in mashes and rivers. However, both are affected by plastic waste during the process of feeding. They engulf small pieces of plastic which can easily kill them; hence, endangered species.

CHAPTER FIVE: ANALYSIS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

The analysis, conclusion, and recommendations were based on the findings that were obtained from plastic waste management in Iganga municipality. This chapter is intended to answer the question of whether plastic waste can be used to execute a desirable plastic sculpture as a way of managing waste and creating awareness among the public. It also explains the effects selected plastic waste has on the environment if it is left unattended. It presented the final sculpture executed from selected plastic waste from the environment. The finished sculpture contributed towards increasing awareness and improving attitudes towards environmental conservation.

5.1 Analysis

The study assesses the use of plastics waste for sculpture and waste management in Iganga municipality. Experimenting with plastic waste as a material for sculpture which was the main focus of the study aimed at plastic waste mitigation. The goal of this study has evolved from managing plastic waste to experimenting with plastic waste as a material for sculpture.

Any waste recycling and reuse device's success depends on how diligently the waste's generators are willing to categorize it according to generation. This allows for quick salvage and identification of items that can be recycled and reused while saving time and money for garbage treatment, shipment, and disposal.

Findings of the study identifies several inequalities in planning and organizing management of plastic waste in iganga municipality for example the municipality relies on previous years plan for managing waste. Notwithstanding the variation in other dynamics behind the increase in the scale of plastic waste.

Many students in schools have started participating in scavenging sports, picking plastic bottles every morning as they get closer to lockdown. This has contributed to the municipality's condition getting better. It is important to motivate and provide incentives to employees who work in dangerous occupations, such as waste management (collection and disposal), to keep their morale up.

According to the results of information given by respondents of interviews from Iganga Municipality, many household do not have any gazzeted places for disposing off rubbi

From the results, only 0.7% of the respondents recycled their plastic waste. 72.9% of the respondents were females who indicated that they managed plastic waste around their homes. Plastic waste was disposed of mainly at open dumpsites, and burning, or discarding as litter. However, 93.6% of the respondents re-used some plastic containers for food, water, and oil storage. There was a significant difference in terms of how the respondents re-used their plastic waste among the four administrative units. Reusing of plastic waste was highest among unemployed households.. We recommend educational campaigns and adoption of sustainable and affordable plastic waste disposal methods in the study area. The campaigns should be spearheaded by the relevant agencies including the municipality government and artists at the fore front.

5.2 Conclusion

In conclusion, the current plastic waste disposal methods are not environmentally friendly. Recycling of plastic waste is practiced on a small-scale despite its potential to generate income.

The findings revealed that Iganga municipality have good level of knowledge as well as have positive attitude but their practice towards solid waste management was not effective so it was realized from the study that, waste management in the communities in Iganga

municipality had challenges which needs immediate actions. Waste is dumped indiscriminately which ends up blocking all the water ways and drainage system. This has led to spread of diseases and floods causing loss of lives. It was realized, that community needs awareness through sensitization pertaining to waste management since they are seeing the effect but the blame is pushed on the government as not doing its job. All their actions towards waste management is a result of not regarding waste as a resource but rather something that needs to be sent to the landfill. It is therefore most appropriate that artists play their role of utilizing plastic waste by manipulating it and turning it into sculptural forms.

The study revealed that plastic waste management in Iganga is still ineffective, and this is attributed to lack of implementation of the government policy and legislation on plastic waste. However it has proved to be most desirable material for recycling and creative use by artists because of its numerous properties of being light weight, strong, durable and inexpensive . Plastics are poor conductor of heat and electricity , it is water proof and can be molded easily into many other shapes Manufacturers need to be encouraged to do more recycling of the used plastic in order to absorb a bigger volume of plastic waste disposed in the environment.

Managerial process for waste management in municipalities have deficiency, Planning and organization for plastic waste management is still poorly coordinated leading and controlling functions being equally half hazardly implemented. This could partially be attributed to constrained budgets the local government operates on, inadequate awareness to communities. It is understandable that all local government units operate under meager financial resources.

Waste management has not been economically rewording investment, therefor not very much a priority. , It is high time the artists come out to utilize the abundant plastic waste material and turn it into a money generating venture. It is past time for artists to use the vast amounts of plastic waste fabric and transform them into profitable things in today's world where the

environment is at stake and sustainable development is the way to go. The management of plastic garbage is one of the challenges with significant environmental effects, so it needs to be given priority and funding. Through a conversation with those collecting plastic waste, I learnt that many are trying to avoid plastic products, artists can be change makers, by reflecting the world around them and expressing ideas through creative work.

According to research done in several African nations, recycling industrial waste might be a lucrative endeavor (IDRC 1919). That is in line with the decentralization strategy and the Local Authorities Act (1997).

Iganga Municipality has the power to give the local community recycling assistance and to designate a space for these organizations to host events and exhibit their goods. The organizations had to concentrate on using the waste to make products and strengthen substances derived from fuels (RDF) from the waste. The research into tourist initiatives that may prove to be self-sustaining inspires artists to create sculptures that are both eye-catching to visitors and instructive to the public. To raise awareness of the dangers of plastic trash, sculptures are placed in key locations. This draws attention to the issue and beautifies the community.

5.3 Recommendations

Comprehensive planning is required for the management of plastic waste, and changes brought about by development in each municipality and city center must be considered. An increase in population and commercial activity may call for more space to store newly created plastic waste. For an artist the creative process increases understanding and appreciation for the subject of art.

An efficient system for managing plastic waste depends entirely on stakeholder participation. Network participants who are concerned about something end up being important people who work to complete network-based initiatives, among which plastic waste management is one.

Research on the efficient use of plastic trash is essential and will improve waste management. The public's exposure to the results of the findings is crucial for accelerating the network's ability to recycle, reuse, and reduce plastic waste.

To address the issues raised by the study, rules, and regulations regarding the management of plastic garbage should be improved, and a complete criminal justice system framework should be implemented. Such laws and regulations will, however, function flawlessly in the presence of innovative equipment, public involvement, and network sensitization.

It’s important to recognize and comprehend the crucial function that plastic waste collectors play in supporting local corporations. All participants in the system of gathering, classifying, manipulating, and turning plastic garbage into acceptable products need to be guided.

Scavengers must also create cooperative unions that will enable them to be supported. Artists must establish institutions through which they may receive business and fitness instruction, as well as financing that is easier to get. The results might be better in terms of digital quality, increased productivity, increased revenues, and improved social standing.

To be able to guarantee environmental safety and preservation, alternative sites for the disposal of hazardous waste must be identified. The disposal procedures need to adhere to appropriate standards and laws under the current system.

Improving policies and regulations on managing plastic waste and adoption of a comprehensive legal frame work will provide a solution to the problem of identified in the study. However such policies will work perfectly in presence of improved technologies and

machinery, public participation and community sensitization. While supporting local groups, there is need to acknowledge and recognize the instrumental role played by plastic waste collectors. Provision should be made to support all players involved in the process of collecting, sorting and manipulating plastic waste and turning it into the desirable products. They also hire retailers to uncover these wastes and gazette landfills.

Scavengers should also form a cooperative union where they can be supported .Artists should form an association under which they can be able to secure some loans, receive health care trainings. Improving a recycling sector was advised by traders. This might cut down on the money lost on shipping processed waste plastic to other countries for recycling. Additionally, it may provide prospects for both formal and informal work.

In order to enhance environmental protection and conservation, alternative sites of disposal of hazardous waste should be located, the disposal operation should follow acceptable methods and standards in the existing legislature.

Technical innervations; The municipality needs to buy more vehicles and supplement on fuel, this will improve on speed and area served in a limited time; provide cover material to prevent waste from being blown off. Also gazette landfills and appoint agents to monitor these landfills.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE

Dear respondent, I am **Lugya Godfrey Nsalasatta** a student of Kyambogo University undertaking a study on the use of functional art to improve on plastic waste management in Iganga Municipality. I therefore request you to participate in this study.

The findings of this study will be solely for academic purpose. I wish to assure you that the information shared in this study will be kept as a secret.

SECTION A: BIO DATA

Please tick the category you belong to.

1) Gender: Male ☐ Female ☐
2) Age bracket: 20-30 years ☐ 31-40 years ☐ 41 and above ☐
3) Education Status: None ☐ Primary ☐ Secondary ☐ University ☐

SECTION B: COMMON PLASTIC WASTES DISPOSED IN THE ENVIRONMENT IN IGANGA MUNICIPALITY

1. What type of plastic waste is commonly discarded in your environment?

   Bottles ☐ Jerrycans ☐ Syringes ☐ Cups/Jugs ☐
   ☐ Appliances ☐ Basins ☐ Brushes ☐
   Others

2. How is plastic waste managed in your area?

   Recycling ☐ Burning ☐ Reusing ☐ Dumping ☐

3. Who is responsible for managing plastic waste in your environment?

   Collectors ☐ Municipal Council ☐ NEMA ☐
   Community ☐ Artists ☐ Market vendors ☐

4. Is collection of plastic waste important in your environment?

   Yes ☐ No ☐

   If no, give reason for your answer.

   ……

   ……

5. How are plastic wastes useful in your community/environment?

   ……

……

……

6. Why do you think it's important to collect plastic waste from your environment?

……

……

……

7. In which way are collected plastic wastes useful in your community?

……

……

……

8. Are there any art articles made from plastic in your environment?

Yes ☐ No ☐

If yes, how useful are they to the community?

……

……

……

If no, how do you think plastic waste material can be used for artwork?

……

……

……

9. How can artwork made from plastic waste affect the people in your area?

……

……

……

Thank you very much for being part of this academic research.

APPENDIX II: INTERVIEW GUIDE

1. What items can be produced from plastic waste materials.
2. How can the community be encouraged to collect plastic waste material from the environment?
3. How are plastic materials utilized in the community?
4. What impact does discard plastic waste have to the environment?

Thank you very much for being part of this academic research.

APPENDIX III: OBSERVATION COLLECTION SHEET

Site		**Location**		**Visiting Date**		**Type of information**
Observer		**Division**	**Ward**	**Start time**	**End time**	
Name:						
Observed events						
01						
02						
03						
04						
05						
06						
07						
08						