

THE EFFECTS OF POOR SANITATION ON PUBLIC HEALTH AND  
THE ENVIRONMENT.  
A CASE STUDY OF FORT PORTAL MUNICIPALITY,  
KABAROLE DISTRICT- UGANDA.

BY  
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## DECLARATION

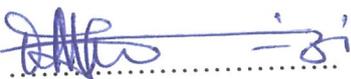
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## APPROVAL

This is to certify that this Dissertation entitled, "The effects of poor Sanitation on Public health and the Environment", using Fort Portal Municipality as a case study area, has been submitted in partial fulfillment of the Award of the Degree of Bachelor of science in Environmental Management, of Kampala International University.

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## LIST OF ACRONYMS

<b>AMA</b>	American Medical Association
<b>CBOS</b>	Community Based Organizations
<b>DRC</b>	Democratic Republic of Congo
<b>DDHS</b>	District Director of Health Services
<b>DSOER</b>	District State of Environment Report
<b>EIA</b>	Environmental Impact Assessment
<b>FORUD</b>	Foundation for Rural Development
<b>GOU</b>	Government of Uganda
<b>HMIS</b>	Health Management Information Systems
<b>JESE</b>	Joint Efforts to Save the Environment
<b>KRC</b>	Kabarole Resource and Research Centre
<b>KCC</b>	Kampala City Council
<b>KIU</b>	Kampala International University
<b>MOFPED</b>	Ministry of Finance, Planning and Economic Development
<b>MOH</b>	Ministry of Health
<b>NEA</b>	National Environment Act
<b>NEIC</b>	National Environment Information Centre
<b>NEMA</b>	National Environment Management Authority
<b>NES</b>	National Environment Statute
<b>NWSC</b>	National Water and Sewerage Corporation
<b>NGOS</b>	Non- Governmental Organizations
<b>PEAP</b>	Poverty Eradication Action Plan
<b>RUWASA</b>	Rural Water and Sanitation
<b>SWG</b>	Solid Waste Generation
<b>SWM</b>	Solid Waste Management
<b>UEPF</b>	Uganda Environment Programme Forum
<b>UN</b>	United Nations
<b>UNCED</b>	United Nations Convention on Environment and Development
<b>UNDP</b>	United Nations Development
<b>UNICEF</b>	United Nations International Children's Emergency Fund

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<b>VIP</b>	Ventilated Improved Pit latrines
<b>VOT</b>	Voice of Tooro
<b>WHO</b>	World Health Organization
<b>WSSD</b>	World Summit on Sustainable Development
<b>WSSPR</b>	Water and Sanitation Sector Performance Report

## OPERATIONAL DEFINITIONS

- 1 Access to improved water sources:** - Refers to the percentage of the population with reasonable access to adequate amount of water from an improved source.
- 2 Environment:** - Means the totality of Man's surrounding including both the biotic and abiotic components.
- 3 Environmental contaminants:** - Are materials or substances that alter or bring about changes in environmental quality once they are exposed to the environment.
- 4 Hygiene:** - Refers to the cleanliness of an individual or a place.
- 5 Public Health:** - Is a science and art of preventing diseases, prolonging the life span of individuals, and providing both physical and mental health to the people.
- 6 Landfill:** - Is a land disposal site for solid wastes after they have been collected and the process involves the use of a disposal mechanism that uses vehicles to dispose and compact the wastes, cover with a layers of soil to form various layers until the depression is full.
- 7 Safe water:** - Defined as the water of good quality that is suitable for human consumption.
- 8 Sanitation:** - Refers to the principles and practices relating to hygiene of individuals, accessibility to safe water and clean water, as well as physical infrastructures such as good roads, buildings and latrines/ toilets.
- 9 Solid wastes:** - Are discarded materials from homes, agricultural fields, urban settings, and industrial processes, which no longer have a value or purpose to the owner.
- 10 Sustainable Development:** - Is the development that aims at satisfying the needs of the present generation without compromising with the ability of the resources to satisfy the needs of the future generations.
- 11 Wastes:** - Are materials or substances that appear as by-products of human activity or those materials which may not have an immediate value.
- 12 Water pollution:** - Refers to the contamination of water by foreign substances or materials that make it unsafe and unsuitable for the survival of aquatic creatures/ organisms, and for human consumption

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## ABSTRACT

This dissertation represents the findings of the research conducted in Fort Portal municipality, Kabarole district. It describes the effects of poor sanitation on Public health and the Environment. Poor sanitation characterized by liquid wastes, solid waste disposal techniques, inadequate sanitation facilities and unsafe water supply systems. It is associated with diseases such as cholera, typhoid, malaria, bilhazia, trachoma, schistosomiasis, and dysentery.

The objectives were to find out; the effects of poor sanitation on public health and the environment, possible environmental contaminants, activities in Fort Portal town and sanitation facilities available in the municipality.

Achieving the above objectives would result into establishing better ways of improving sanitation and public health standards in the municipality, increase awareness in people about keeping good hygiene, help other researchers in the same field and provide basic information to municipal authorities to enable them make better framework and planning.

The methods used in data collection included: Sample size determination, use of questionnaires, interview guides for key informants and focus groups, and observation checklists for only the researcher. Data design, analysis and processing were used to extract meaningful information from the data. Cases of poor sanitation were as a result of uncontrolled waste disposal in public places, fewer latrines, and limited funds in waste management, and lack of awareness amongst the people.

It should be noted that sanitation, public health and the environment are related. Thus, poor sanitation can result into diseases, affect incomes of the people and make homes unrest due to morbidities and deaths. Currently, the highest infection in Fort Portal is malaria at 57.03% since stagnant wastewaters and solid wastes dumped in open sites are breeding places for mosquitoes.

Therefore, there is need to encourage the public to participate in the proper handling of wastes and hygiene standards, more hygiene awareness campaigns by the authorities, procurement for more funds and solid waste disposal facilities, making of waste water inventory programmes, and strengthening of bye- laws and implementing of Government laws and policies responsible for preventing the people and the environment from diseases and contamination respectively.

## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 Back ground of the study

Winston defined Public health as a science and art of preventing diseases, prolonged life span and providing physical and mental health, and efficiency through organized community efforts and education of individuals.

American medical association (AMA-1945) defined Public health as an art and science of maintaining, protecting and improving the health of the people through organized community efforts. Public health is thus “preventive in nature and serves not to cure, but to control, and if possible to halt diseases and deaths”. Public health aims at creating a post-effective situation in the maintenance of a society’s health.

Sanitation on the other hand is the principles and practices relating to the collection, removal or disposal of human excreta, refuse, sewage, and waste water, as they impact upon users, operators, and the environment. It is defined to include physical infrastructures like good buildings, water supply plants; hygiene related behaviour, disposal of waste water, solid waste, human excreta, and refuse in the context of household or municipal activities

During the Earth summit held in Rio de Janeiro, Brazil (1992, UNCED convention) issues of Public and Environmental health related to Municipal wastes management and proper sanitation standards featured prominently among the other environmental problems to be given serious consideration .It was realized that man’s activities were the leading causes of ill-health and poor sanitation, environmental degradation, and destruction of the environment through unsound

Waste management practices.

It was further recognized that urban Municipal authorities in developing countries were increasingly getting constrained to provide adequate waste management services due to financial, technical and Institutional constraints among others. In order to reverse this trend, there is need for urban Authorities in developing countries to work in partnership with urban communities and all stakeholders involved in solid /liquid wastes generation and management, including Non-Governmental Organizations (NGOs) and Community based organizations (CB0s)

Human well being is influenced by environmental factors, therefore, it is important to understand and control people’s interactions with the environment. Environmental health is a sub-field of

Public health and is concerned with accessing and controlling the impact of people on their environment. Hence, there is need to understand that the environment responds and impacts on man in many ways; therefore, it calls for an understanding of environmental health as an approach for studies and systems of human nature interactions.

Sanitation status in Uganda is currently characterized by poor disposal facilities both in the homes and Institutions that are usually lacking or insufficient. Latrine coverage for the country in 1996 was below 50% (RUWASA study 1996). A pathetic new phenomenon has developed due to this pressure, code-named the “flying latrines” where faeces are wrapped in polythene bags and people throw them out of their premises. Other issues of concern about sanitation in urbanities in Uganda include; poor management of solid and liquid wastes. This is most noticeable in urban settings where rubbish collection schedules have remained un reliable due to various factors. Indiscriminate disposal of refuse into open spaces and compounds around premises are common. Even urban areas are not sufficiently sewerred to cater for industrial and domestic waste water. Cultural beliefs and taboos impede proper sanitation in some areas by discouraging the use of latrines. Poor personal domestic and food hygiene lead to diseases’ transmitted through oral-faecal routes to remain rampant-like cholera. Poor management of the safe water chain from source to the point of consumption and financing of sanitation activities both at the national and district levels has remained greatly negligible (environmental health Policy Draft Jan 1999)

The political turmoil and the break down of law and order in Uganda in 1970`s and early 1980`s brought down national latrine coverage to the lowest recorded level of 10% average in 1993 (GOU, 1994 and UNICEF report, 1984).

Rio Declaration, 1992 principle 1, provided that “Man has the fundamental rights to freedom, equality and adequate conditions of life in an environment of quality that permits life of dignity and well being, and bears a solemn responsibility to protect and improve the environment for present and future generations”. This means that inadequate water sources and improper management of solid waste poses significant sanitary impacts on health, human aesthetics and environment. It’s therefore important that we manage the water sources and refuse properly if cleaner sanitation standards and better Public health are to be realized.

Increasing Urbanization, rising standards of living, and rapid development associated with population growth has resulted into increased solid waste generation (SWG) by commercial, domestic and other activities.

Unfortunately, the increase in solid waste generation and lack of proper liquid waste facilities in almost all urban areas has not been accompanied by an equivalent increase in the capacity of the relevant urban authorities to deal with this problem, hence have resulted into declining sanitation and Public health conditions. Fort-Portal town has no gazetted waste dumping sites and much of the waste disposal is done indiscriminately, especially use of polythene bags (Kavera). This is because the terrain has made it difficult to have sites developed as people settle at top hills and valleys have rivers, streams or wetlands.

Currently, Fort-Portal Municipality generate over 32 tonnes of wastes per day and only six tonnes are collected due to inadequate logistics such as funds, lack of skips, vehicles for transportation and the challenging nature of wastes (DSOER 2004/05 Kabarole district). The wastes that are generated and collected in the Municipal council are being illegally dumped in a forest reserve near administration offices in Boma.

However, the Municipal council is acquiring an alternative dumping site in Saaka-Bwanika, and Mukaburara dry crater in Kicwamba Sub-County. Although this is quite a distance away from the town, human settlements and other developments, waste collection and disposal and other facilities, which relate to sanitation are still a problem, especially during the rainy season. (DSOER, April 2004, Kabarole district).

In Uganda, the responsibility for solid waste management lies with the local government as specified in the Public health Act 1964, and the local government Act 1997, and Fort portal Municipal council is the authority charged with the responsibility in this case.

## **1.2 Statement of the problem**

Public health and Environmental health have been adversely affected by poor Sanitation, characterized by liquid and solid waste disposal, and lack of adequate sanitation facilities like good latrines/ toilets and clean water supply systems. People from near waste dumping sites (Landfills or open places) and others who use contaminated water have suffered from diseases like cholera, malaria, typhoid, dysentery, and many other communicable diseases (UEPF, 1995). The problem not only threaten the health and lives of people, but also cause deteriorating poor environmental health and unsanitary conditions that may result from foul air which comes from the dumping sites, and sometimes cause the death of aquatic creatures due to the presence of excessive water pollutants. Poor administration and mis-management of some organizations and programmes are some of the factors which have contributed to poor sanitation in urban areas of Uganda and else where abroad (UN Report 1987).

This challenge needs an immediate hand from the Fort Portal Municipal council such that reliable waste management strategies and facilities are established, sanitation facilities such as public latrines/ toilets should improved, as well as trying to reduce the levels of contamination of water sources in the town, most especially water in river Mpanga and Mugunu-stream, Kisenyi, since people use them as sources of water.

### **1.3 Objectives of the study**

#### **1.3.1 Main objectives**

The overall objective of the study was to find out the effects of Poor Sanitation on Public health and the Environment.

#### **1.3.2 Specific objectives**

- To identify the environmental contaminants in Fort Portal town.
- To find out the factors responsible for poor Sanitation in Fort Portal town, and the effects of environmental contaminants on the peoples' health and the environment.
- To find out the challenges facing the present Water and sewage facilities, solid/ liquid waste handling techniques and the overall sanitation conditions in Fort-Portal town.
- To find out what has been done to deal with the environmental contaminants and suggest other possible measures.

### **1.4 Research questions**

- What kinds of activities are carried out in Fort-Portal town?
- Does Fort-Portal town have many of its dwellers lacking access to latrines, safe water and proper housing facilities?
- Is there any cases of disease epidemics and foul air within Fort-Portal communities)?
- Does Fort-Portal town have reliable sewage works, garbage skips or other techniques of handling the wastes?
- Are the people aware of the dangers of improper solid waste management, using contaminated water, and unprotected human excreta disposal?
- What options can be there to improve Public health and Sanitation standards in Fort-Portal town?

## **1.5 Scope of the study**

The study was focused primarily on the effects that are brought about by poor sanitation conditions on Public health and the Environment in Fort Portal town. The extent of the study also included identification of the sources of land, water, and air pollution, solid waste disposal facilities and management techniques used in the town, water supply systems, major activities carried out in Fort Portal town and settlement patterns of the people in Fort Portal Municipality. Thus, the study covered the challenges that were met as a result of the circumstances of Poor Sanitation prevalence and what has /or needs to be done to address such challenges by the authorities and stakeholders responsible in Fort Portal Municipality.

## **1.6 Purpose of the study.**

The research study aimed at finding out how best Sanitation and Public health standards can be improved in Fort Portal town through practices such as proper excreta and solid waste disposal, provision of adequate Sanitation facilities to people, and awareness creation in the Public arena, especially of the dangers of poor waste disposal and water source contaminations. The research will be of great importance to the academicians in related fields of Environmental protection, disease and vector control, reduction of diseases epidemics, and can even provide a basis for future Researchers.

The local authorities, town organs and town dwellers in their respective capabilities would find the outcomes of this study helpful, and would therefore use them as a basis for proper urban planning of infrastructures, land fill sites, re-organization of settlement patterns and implementation of sound environmental management strategies.

## CHAPTER TWO

### 2.0 LITERATURE REVIEW

#### 2.1 Introduction

The chapter reviews the literature available and provided by various scholars and academicians for the topic being handled.

First part discusses the Environmental contaminants, the state of sanitation in Uganda, Water safety and water supply. The second part discusses the access to improved sanitation, solid waste disposal, and the factors affecting sanitation. Third part discusses the effects of poor sanitation and management of sanitation while the fourth discusses the reduction of the effects of poor sanitation and concludes the chapter.

#### 2.2 Environmental contaminants

Environmental contaminants account for all those materials or substances that can alter or bring about changes in the environmental quality once exposed to the environment. They include physical occurrences such as radioactive emissions, landslides, soil erosion process, volcanicity; biological contaminants such as: water eutrophication by the activities of bacteria, leachate and gaseous release from landfills, and all other forms of pollutants generated by man like Industrial wastes, waste water, human excreta, construction debris, among others (Environmental health perspective journal may 2002, Republic of South Africa).

The population generally engaged in non-agricultural activities, which may include commercial, physical structures, social functions, and settings, industrial processes and others, characterizes urban areas.

Chadwick (1834), in his report “General report of sanitary conditions of the labouring population of great Britain”, observed that there was a great relationship between sanitation, air quality, ventilation and diseases. He suggested in his concepts that diseases were caused by foul air arising from the decomposing organic wastes, automobile exhausts, poor hygiene standards at house hold level, and the use of unsafe contaminated water. Water sources are at the centre of contamination by human excreta, activities and animal wastes which contain a variety of bacterial, viral, protozoa pathogens, and helminthes parasites, which sometimes are referred to as microbiological contaminants. The use of such water for drinking, preparing food, contact during washing, or bathing, and even inhalation of water vapour may then result in infections.

Faecal contamination occurs when man directly excretes on land and this finds its way into water bodies through run offs (Esrey et al 1991).

The most serious pollutants especially for aquatic environment in terms of human health worldwide are pathogenic organisms. Among the most important water borne diseases include cholera, typhoid, bacterial and amoebic dysentery, enteritis, polio, and schistosomiasis. At least 25 million deaths of people each year worldwide are blamed on these water related diseases. Nearly two-thirds of the mortalities of children under the age of five years are associated with water borne diseases. The main source of these pathogens is from un treated or improper handling of human wastes, animal wastes, wastes from fields near water sources, and wastes from most food processing industries with inadequate waste water treatment facilities (William P. Saigo ).

### **2.3 State of sanitation facilities in Uganda**

According to Esrey (1998), sanitation practices promoted today are one of the broad types “flush and discharge” or “drop and store.” Over the past years flush and discharge has been regarded as the ideal technology particularly for urban areas. However, most cities in the third world cannot afford the necessary resources in terms of water, money and institutional capacity to provide the flush and discharge system, and because of this, the flush and discharge system cannot be provided to the low income peri-urban settlements. Consequently, the residents (households) rely on some kind of “drop and store” sanitation to deal with the technology for their needs. Although “drop and store” technologies can prevent pollution in some places if well designed in urban areas, spaces for digging deep pits are not available in some cases. Difficulties, such as ground water conditions have destabilized the state of sanitation and hence led to poor sanitation with its relevant effects on the people and the environment

The vast urban populations not served by the sewerage systems either by choice or otherwise, employ alternative methods of one site sanitation such as septic tanks, ordinary pit latrines and ventilated improved pit latrines. The choice of alternative methods depends on the availability of the sewerage network, quality of housing and the ability to pay for sewage services (NEMA 1998). The methods of disposing human wastes have evolved from very simple approaches such as private toilets to the major water carriage systems today.

The world resource institute, 1996 asserted out that “with respect to sanitation, the chief method of excreta disposal in Uganda is a pit latrine, which however is not widely used”.

Although the coverage level has steadily increased, the present average level of coverage by pit latrine is 10% only. It is a general crisis of improper human excreta disposal.

A case study is the Kampala city where it was estimated that 2% of the households in Kampala have no access to toilets, while 6% have waterborne toilets inside their houses. The majority share toilets. (National environment information centre (1993). The most commonly used methods is the use of the pit latrine. According to Nuwagaba, a health inspector, MOH (1999), most latrines are filthy, poorly constructed and one located too close to the overcrowded dwelling units. However, these authors did not explain why some people did not have known means of fecal disposal.

#### **2.4 Safe water**

The world summit on sustainable development (WSSD) in Johannesburg in 2002, one of the key commitments was having the largest proportion of people with access to safe drinking water and basic sanitation by 2015 (UN report, 2002). In some areas, shallow pits are used as pit latrines where by human wastes flow into channels and valleys causing surface water pollution with fecal materials, which in turn increases the costs of treatment. Spring water used untreated has been cited as a cause of the high incidence of cholera in Uganda, especially in urban areas like Kampala, Mbarara, Kasese, Fort – Portal etc. Cholera has been associated with high morbidity and mortality rates (NEMA 2003).

Water accessed through protected springs, shallow wells and boreholes represents the main source of water supply for the urban areas in Uganda, with exception of a few urban areas with piped water.

#### **2.5 High Population growth slows safe water supply**

Since water is a vital resource for life socio-economic development and maintenance of the environment, Uganda is well endowed with this resource. However, the quality and safety of water is a critical issue (new vision, 2006). It is for this reason that the Constitution of the Republic of Uganda 1995, Article 39 (i) (ii) states that “Every person has a right to a clean and healthy environment”.

This was again stipulated in the Water Bill 1996, that Ugandans are entitled to clean and safe water within easy reach and hygienic sanitation facilities, based on management responsibility and ownership by the users.

The improved water supply and sanitation services have a major social, economic and wealth impact; it enables people to live with more dignity and has a positive effect on their health. Bringing water closer to the home has a tremendous impact on the quality of life. This reduces the unnecessary burden of households, especially women and children, while increasing the rates of consumption and use for other purposes. It further states that an improved sanitation system provide disposal facilities that can effectively prevent human animal and insect contact with excreta.

## **2.6 Access to improved sanitation**

Access to improved sanitation refers to the percentage of the population with access to at least adequate excreta disposal facilities, private and shared but not public, that can effectively prevent human, animals and insect contamination with excreta. These improved facilities range from simple but protected latrines to flush toilets with sewerage connection .Access to an improved water source refers to the percentage of the population with reasonable access to an adequate amount of water from an improved source, such as households, connection, public stand pipe, borehole, protected well or spring. In spite of the importance of safe water and hygienic situation to the well being of the population, achieving real gains in sanitation coverage has been low and slow. According to the water and sanitation sector performance report (2005) further reveals that only 88% of urban dwellers obtain drinking water from protected sources and coverage for sanitation is 60%. To make it worse, the challenges for the provision of safe water and sanitation are getting harder due to rapid population growth, increased urbanization and industrial activities, and poverty in peri-urban areas and increasing habits of environmental degradation.

## **2.7 Solid waste disposal**

Wastes can be divided into many different types. The most common methods of classification are either by physical, chemical and biological characteristics. Solid wastes are waste materials that contain less than 70% water (UNDP 2005).

The class includes such materials as household garbage, some industrial wastes, some mining wastes, and oil field wastes are usually waste materials that contain less than 10% solids, such

wastes may contain high concentrations of dissolved salts and metals, while sludge is a class of waste between liquid and solid.

They usually contain 3% and 25% solids, while the rest of the dissolved materials are water (Nation water and sewerage co-rporation Uganda). **Solid waste management:** Solid waste management encompasses generation, storage, collection, transportation and disposal.

## 2.8 Factors affecting Sanitation

According to the Water and Sanitation Programme (1999), the causes of poor sanitation in many urban areas are as a result of poor management. For instance, in Uganda, the Constitutional responsibility for sanitation is fragmented as several ministries and agencies that all appear to play some role in this sector. For example, in large urban areas like Kampala, NWSC is responsible for on site sanitation services. KCC is the agency responsible for on site management activities of the city.

The MOH working through the local government is responsible for the co-ordination of rural sanitation Legislation and is also scattered in various acts and decrees. In final analysis, neither government ministry nor lead agency is accountable for sanitation in Uganda (MOH, 1991).

The nature of land in terms of topography and soil texture at times contributes to poor sanitation. The topography mainly is characterized by numerous low lying hills and wet valleys. It is the flood plains which have borne the blunt of the draining problem, and in turn, this is where the sanitary question is evident. The problem of flood plains has made it difficult to construct pit latrines since they have to be shallow and filled up very quickly .It is also through stagnant water collection that people throw their garbage and human excreta. Ministry of health (1991) reported that in Kampala city in some areas, the sandy soils caused deep latrines to collapse frequently.

MOH (1991) interviewed members of NWSC Kampala district team, and noted that in Kampala city pre-urban areas, the very high water table hampers latrine construction. In some areas, rocky, grounds were ranked against latrine construction since it takes a lot of human and financial resources to construct a latrine. Total neglect of duty by relevant authorities, also impinges heavily on sanitation. In many urban areas, land lords/ladies do not provide latrines for tenants, and when they do, latrines dug are two – four feet, and around ten households share one latrine which causes problems of poor disposal.

Financial constraints have been cited as a factor contributing to unhygienic conditions in a given community. According to a report (UNDP 2005), very few Governments have given more attention to sanitation especially in less developing countries.

The number one obstacle has therefore been the weakness of political commitment to better health, although over the last two decades, there has been numerous promises to adopt on.

Birley (1995) stated that very few Governments or Aid Agencies had given much attention to cities' sanitation problems especially those that impact most on the health and livelihood of the poor. He said that in the crowded conditions of urban slums, there are epidemics of communicable diseases such as diarrhoea, cholera and dysentery due to poor sanitation management. He further advanced that community' needs commitment access to 30-50 litres of water per day per person .This must be followed by concurrent and continuing sanitation benefit, sustainable water supply, maintained protection of the sources and distribution systems.

Sanitation problems in the third world are also associated with poverty.

Arthur (1999) pointed out that low developing countries underlying problems affecting sanitation are poor socio-economic circumstances, he summarized the scenario as a "small governmental budget and a large child population with high mortality, accompanied by malnutrition and infectious diseases from poor sanitation".

Poor administration and mismanagement of some organizations and programmes are some of the factors that have contributed to poor sanitation in Uganda and else where abroad. NWSC noted that in Uganda 57% of the urban populations has access to good quality water.

A united nations representative of Uganda in 1987 categorically stated that in Uganda, the situation of unequal distribution of resources arouse and was aggravated by the general mismanagement of the Government and the economy that was prevailing in the country, following the declaration of independence in 1962. The UN officer further stated that no proper planning of water supply schemes was done and even where attempts were made to this end, the schemes were never implemented at all.

According to RUWASA project report (1994), temporary residents tend to ignore sanitation programmes because any time, they will leave.

Studies have shown that residents do not desire improving community standards in all social, economic and health aspects mainly because they are never certain about the time period they are to stay in a particular community.

Birley (1995) mentioned that the existence of inadequate sanitation system affects the level of sanitation and that the inadequacy of the systems is due to the increasing population.

## **2.9 Effects of poor sanitation**

It is estimated that 80% of the diseases in Uganda and more especially in the urban centers is associated with poor sanitation and hygiene. By 2003, the National household coverage of latrines was very low, estimated at 48% compared to the PEAP target of 60% access by 2004. Further more, the piped sewerage services are accessible to only 5% of the population in large urban centers (MOFPED 2003).

Lack of improved domestic water supply, disposal of human excreta, solid wastes, liquid wastes, waste water, hazardous chemicals, and good sanitation is responsible for the large number of both infant and adult mortalities worldwide. Poor water supply and sanitation account for approximately 4 billion cases of Diarrhoea each year, and 2.2 million deaths mostly among the children under the age of five. This is equivalent to one child dying every 15 seconds. These deaths represent approximately 15% of all deaths of children under 15 years in developing countries.

Intestinal worms infect about 10% of the population in the developing world. It is estimated that six million people are blind of Trachoma and the population at risk from this disease is approximately 500 millions. Considering the vigorous epidemiological studies, linking water to Trachoma,

Esrey et al (1991) found out that providing adequate quantities of water reduced the median infection rate by 25% (Global water and sanitation report, (2000) WHO and UNICEF). 200 million people in the world are infected with Schistosomiasis, of whom 20 million suffer severe consequences. The disease is still found in 74 countries of the world. Esrey et al in receiving epidemiological studies, found a median of 77% in rate of infection reduction from well designed water and sanitation interventions (Water supply and sanitation collaborative council, report 2000).

Diarrhea is the most important Public problem affected by water and sanitation, and can be both water borne and water washed. However, adequate quantities of safe water for consumption and its use to promote personal hygiene are complementary measures for protecting Public health. It should therefore be noted that poor sanitation conditions faster the spread of diseases, and make the environment unfriendly.

There are a number of effects associated with poor sanitation which include bad odour, aesthetic problems, flooding and diseases for example dysentery and cholera outbreaks. Homes with dirty latrines attract flies, which feed on the faeces and later contaminate human food. Mosquitoes in stagnant waters near homes transmit malaria, one of the leading killer diseases in Uganda.

There is also a danger of acquiring diseases like dysentery, through germs found in human faeces. Dysentery is transmitted by an infected person when he / she urinate near a water source and the bacteria end up in the water that eventually infect anew person.

Poor sanitation management affects academic performance, according to the survey that was conducted in Uganda, it was found out that about 2.7% of the students in the country lost their time because of poor sanitation related diseases. The survey revealed that many adolescent girls dropout of school due to lack of sanitary facilities that ensure adequate privacy (the New vision Oct, 18<sup>th</sup> 2000).

Pickford (1995) argued that, in Uganda diarrhoea sickness ranks second among the five child killer diseases, being transmitted mainly because of the poor disposal of faeces, and unprotected water sources.

He further argued that the provision of safe Water sources and sanitation is very important, but construction of latrines and digging wells will have little effect on health unless the people use these facilities in the right ways.

Badly managed refuse can promote water pollution by rain-washing debris out of piles of refuse into surface water (NEMA 2004). In Uganda, there is a growing concern about the same problem due to its effects on public health and the environment, and hence retard human development (UNDP 2005). In addition, piles of refuse may also present a fire risk, they smell and they are aesthetically unpleasing in the urban environment. Where refuse disposal services are lacking, much refuse is deposited in open street drains and urban water ways. This causes them to block and may result into flooding. It also creates ideal breeding grounds for mosquitoes and other disease vectors (Cain cross Sandy 1992).

Most developing countries, including Uganda have been faced with the scourge of waterborne diseases. In the Uganda country programme (1990-1995), it was noted that in 1990, there was severe outbreak of cholera, diarrhoea, affecting both the rural and urban population of Uganda. Closely linked to this were a number of causes associated with these diseases. Attewell (1993) observed that since the water is exposed to human and animal contamination, which is a natural pollution, coupled with drinking of unboiled and untreated water accelerates the problem. Water Aid (1992) associated the causes to the irresponsibility of the local community who contaminate these water sources, while many people in 1996, associated the causes for the outbreak of cholera to direct usage of unboiled water.

### **2.10 Management of sanitation**

The world resources institute (1996-97) observed that community involvement in the water and sanitation projects is a key to their success. And that not only must the communities be taught how to maintain and operate systems, but must also be consulted in order to determine what system best suits the local conditions. The advocacy for women involvement is the best way to solve the problem of poor sanitation simply because, they are highly responsible for all household work, and also play a leading role in carrying out household tasks in relation to domestic water and sanitation.

Through different legislation by the Government, has brought local communities, local Governments, Ministries, NGOs and Private sectors into environmental management. However, the capacities of all the above have to be built to ensure continuity of efforts at all levels. The decentralization planning processes in Uganda provide an answer for all inclusiveness in participatory planning, management and monitoring within the same framework, support needs to be given to communities to upscale micro-enterprises in environmental and natural resource management which improve on the sanitary conditions of the country.

Then as far as a global report on human settlements (1996) is concerned, the importance to secure safe and adequately serviced housing in relation to sanitation is ignored by most people.

Housing should do more than simply minimizing diseases and injury. It should meet the needs and priorities of its residents, it should also contribute much to physical, mental and social well being of the People. The quality and size of housing and the quality of the neighbourhood in which it is located should be looked at.

Godman (1962) pointed out that, the basis of sanitation management in all communities is the safe disposal, which will lead to the avoidance of flies. The diseases that may arise as a result of bad sanitation arrangements are dysentery, cholera typhoid and intestinal worms. He also recommended that it is most important that all people use proper latrines, the habit of defecating in open fields should be discouraged. The type of latrines to be used depends upon the nature of the soil and availability of good water supply. The installation of sanitary facilities requires constant effort and investment; the world resource institute (1996 – 97) stated that, the community based services should be organized to support sanitation through the use of housing, particularly for the disposal of excreta and solid wastes, the supply of clean water and the drainage of stagnant Waters. It advocates that people must be protected against biologically contaminated water, which carries harmful micro-organisms. Water in a reasonable quantity is required for adequate personal and domestic hygiene. Water may be supplied from a variety of sources, which should be protected against contamination.

Health education is also necessary for creating community awareness. As regards to a report by the world health organization (1994), female education in particular is important in the improvement of sanitation as it merits special attention in any reformulation of health policies. New vision (2000) published a number of recommendation to improve sanitation in Uganda, and these included mobilizing the districts and communities to intensify sanitation related activities, use of mass media to educate the population on proper sanitation especially hand washing and encouraging communities with long term held negative traditions to abandon then and adopt beliefs which are environmentally friendly.

Wood (1995), emphasized that the best way to ensure long-term lasting health benefits may be as a result of improved water supply and sanitation. Water component which deal with construction of improved water latrines, and hygiene education, is to mainly ensure every household has a sanitary latrine which can last up to a minimum of five years before it is filled up. However, alongside latrine construction, health workers need also to be trained on basic hygiene measures.

Wood argues that a latrine should be situated away from houses and particularly from sources of water. It must be at least 50 feet if it is above it.

Cultural values treasured by a group living together may influence the response to designed development programs. He also observed that values held by a community should be considered in a particular programs or project.

He based his observation on the fact that many sanitation projects that have been designed world wide to improve sanitation have failed. This is mainly due to the designed programmes that are not compatible with peoples' cultural values. Sandy C. (1994) also observed that people tend to embrace ideas and programmes that keep within their values framework and resist those which are direct. RUWASA (1996) project findings in some areas of Kampala district observed that cultural taboos were at the centre of poor sanitation.

### **2.11 Impacts' reduction of poor sanitation in urban communities through Community Education and awareness creation.**

Environmental management includes measures under taken at Individual, Community, National and International levels directed at Environmental protection and conservation so as to ensure better allocation and utilisation of natural resource sustainably. However, this can only be achieved if people's standards of living in terms of feeding, medical service, communication, education, sanitation, to mention but a few are improved. It is also noted that sanitation and Public health are the two sides of the coin, which need not to be treated in isolation. There is therefore an urgent need for Education and awareness creation among key stakeholders in the fields of waste management, business and housing patterns, and water supplies of the town in order to bring about change in the deteriorating Public health and Environmental conditions.

There are major links between sanitation and development. If sanitation were to improve in Uganda, some negative sanitation effects would be reversed. Poor sanitation has significant negative effects on the economy. Estimates based on findings from the 1992-3 Integrated house hold survey indicated that an average of 3.5% of all work time is lost due to sanitation related sickness or injuries (Report of National Integrated Household Survey 1992-3).

Studies on water handling during collection, storage and use have shown that there is progressive contamination of water from source to point of consumption due to poor sanitation, and inadequate/ inappropriate hygiene education, leading to poor hygiene practices.

RUWASA study showed that only 9% of 57% households surveyed were consuming water of acceptable quality (RUWASA, 1996).

The above trends do not therefore obey to the Alma Ata Declaration of 1978, for Primary Health Care, unless the government of Uganda becomes committed to the constitution of 1995, article 39 4(i) (ii) (iii), which asserts, “Every Ugandan has a right to clean and healthy environment” (Environmental health policy draft Jan 1999).

Awareness programs should be carried out to sensitize people on proper solid waste disposal, liquid waste and waste water disposal, domestic and personal hygiene, and safe and clean water management and in general, focus on the dangers associated with poor sanitation. Awareness creation will also help in changing the attitudes of the Public that is to say, wastes management not only is a responsibility of the Municipal Council Authorities, but also requires collective efforts for all key players.

Hence, communities and other stake holders need to be mobilized, trained and exposed to sound waste handling techniques as a way of building interests.

Environmental education aims at educating people on the simple steps they may take within their means to merge and control their environment .in this context, it can be offered as; Formal, informal or in a Non-formal way. Environmental and sanitation awareness should be treated as integral part of education at all levels (NES, 1995).

The National Environment Policy, 1994 recognizes that environmental education is an essential infrastructure and component of sustainable development and environmental protection as far as environmental education and awareness is concerned. There are many actions we carry out that damage our environment. They are done perhaps we are not fully aware of the consequences of our activities. Therefore, there is need for leaders, CBOs, NGOs, Local councils, Teachers and Religious leaders, to quickly seek and acquire skills of managing the environment (NEMA, News letters p.42, 1998).

However, it should be noted that one of the draw backs for urban authorities in dealing with the problem of sanitation facilities and wastes handling is; they fail to get acceptance from the people for where to locate sites for disposal facilities. The Not in My Back Yard Syndrome (NIMBY) exists in people, thus making the sitting of facilities lengthy and costly, (world environmental Day leaflet, 5<sup>th</sup> –June- 2004).

## CHAPTER THREE

### 3.0 Study Area and Research Methodology

#### 3.1 Study Area

##### 3.1.1 Location of study Area.

The research was carried out in Fort Portal Municipality, Kabarole District –Western Uganda, 320 kilometres from the capital city, Kampala. The target population was Adults in the three divisions of the town, East division, west division and south divisions, including government authorities, NGOs, and CBOs in the area who were regarded as key informants. Fort Portal Municipal council has a population of 129,726 inhabitants and the town occupies an area of 42.52 square kilometres.



### 3.1.2 Population composition of Fort Portal Town

Fort Portal is the main town of Kabarole District and is approximately occupied by a population of 129,726 persons according to the population and housing census 2002. Kabarole District has in general a population of 497,720 people of which 239,720 are females and 257,702 are males. The town has a Municipal status headed by the town Mayor, and his Clerks to the council. The town has a diverse ethnic background with rich cultures.

The prominent ethnic groups in the town include:-the Batooro with 45%, Bakiga 20%, Bakonjo 16%, Banyankole 12% and many other ethnic languages as shown in table 1 below.

**The table 1: Summarises the population composition in Fort-Portal town.**

TRIBE	LANGUAGE	INHABITANTS BY PERCENTAGE (%)
Batooro	Rutooro	45
Bakonjo	Rukonjo	16
Banyankole	Runyankole	12
Bakiga	Rukiga	20
Bamba	Rwamba	04
Banyoro	Runyoro	01
Others	Mixture/ English	02

**Source: DSOER 2004/05, Kabarole district.**

Fort-portal town is relatively a busy place with numerous trading activities taking place. This is because the Town is occupying a strategic position in the Region. It is located between Bundibugyo, Kamwenge, and Kyenjojo and Kasese districts, with a link to Democratic Republic of Congo (DRC), via Kasese-Bwera town. Trading is the dominant activity in the town. Other income generating activities include; Tourism especially in Omukama's palace, Hotel and Lodging facilities, and even selling of Agricultural produce.

### **3.1.3 Topography of the Area**

Fort-Portal town lies in the plateau / slopes of the valleys of great Mount Rwenzori. The area lies in the altitude ranges from 1300-1800 metres above the sea level. Geologically, Kabarole district consists of Kiamara catena which has major soils of red-sandy, clay and loams underlain by soft laterite soils (DSOER April 2004, Kabarole)

### **3.1.4 Climate and vegetation of the Area**

The area receives fairly well distributed bi-modal annual rain fall averaging to 1200 millimetres per year, with temperatures averaging between 20<sup>0</sup>-30<sup>0</sup>c in most parts in the year round. However, in Fort-Portal town, temperatures can fall below 19<sup>0</sup>c especially in the wet seasons. The environment is thus favourable for the existence of life, and this can account for the evergreen broad-leaved coniferous tree plantations, woodlands and grasslands in the area (DSOER April 2004, Kabarole).

### **3.1.5 Urban environment in Fort Portal town**

Fort-Portal is the main urban centre of Kabarole district named after an English explorer, Sir, Gerald Portal. The town has a population of 129,726 persons (population and housing census 2002), and it covers an area of 42.52 square kilometres, with three divisions namely, East division, West division and South division. Fort-Portal Municipality is where the administrative head quarters of Kabarole district are located.

The town is 320 kilometres from Kampala, capital city of Uganda via Mubende district and Kyenjojo. It is also 70 kilometres from Kasese town and 72 kilometres from Bundibugyo, while it is 42 kilometres from Kyenjojo town.

Apparently, there are less or no slums as such in Fort-Portal Municipality. The former slums of Kisenyi and Biafura can now be termed as developing areas but not real slums per se. Environmental degradation is rampant in the Municipality, especially drainage of wetlands along side river Mpanga. There is also an increasing level of water source pollution as a result of activities such as building constructions, commercial refuse dumping and hospital hazardous wastes dumping mainly from Kabarole referral hospital (Buhinga) near these water sources.

Water in River Mpanga has been polluted as a result of the effluent from slaughter slabs of Kabundaire abattoir, pit latrines and mush rooming car-washing bays along river Mpanga.

### **3.1.6 Human Settlement and Housing Patterns in Fort -Portal town**

The housing patterns are haphazardly planned in most parts of the town unlike in the central-south division, since better planning of housing requires a lot of costs.

In the Municipality, the housing units would best be classified as high and middle class housing found in Boma and Njara residential areas, medium class in Kagote residential area in West division, and parts of East division in Kitumba. There is also low class housing units in areas of Kachwamba and Kasusu in south division, which would be termed as commercial, where there is a residential and commercial unit. More concentrated low housing units in South division are found in parts of Kisenyi and Rwengoma areas. (DSOER, Apri 2004 Kabarole).

## **3.2 Research Methodology**

### **3.2.1 Sample size determination**

The researcher used systematic random sampling techniques to select the respondents from the three divisions of Fort Portal municipality. The technique involved choosing the respondents at given intervals. For residential places and less busy areas, the researcher could leave an interval of 15-20 households before he could select a respondent. In busy places of the town, especially markets and shop areas, the researcher could make an interval of 20-25 door shops before he could select a respondent to interview. Out of 129,726 persons in Fort Portal municipality, a total of 150 respondents were used in this research study. This sample size of respondents included businesspersons, political leaders, civil workers, and civilians/ local residents. A total number of 140 respondents representing 93.33% of the sample were interviewed using the Questionnaires, and 10 key informants representing 6.67% of the total sample were interviewed using the Interview Guides, totaling to 150 respondents. The sample size was evenly distributed using a systematic random sampling approach in all the three divisions of Fort Portal municipality. Therefore, an overall percentage of 56.7% males and 43.3% females were reached in the course of the research study, and this shows that the researcher was gender sensitive.

At least 50 respondents were approached from each division, representing 33.33% of the total respondents, and these also included the key informants who were chosen from various offices operating in the divisions such as NGOs, CBOs, and Governmental offices.

### **3.2.2 Data collection Instruments and Methods**

#### **3.2.2.1 Use of Questionnaires and Interview Guides**

The researcher used systematic random sampling techniques to select respondents from the population equally in all the three Municipal divisions of Fort Portal town. At least 140 respondents were interviewed by face-to-face interviews. The researcher could interview each respondent using the prepared questions on the questionnaires. This means 140 Questionnaires were filled by the respondents approached, and where necessary the researcher could translate the questions in the Questionnaires into simplified English, and local languages of Rutooro, Rukiga and Runyankole for easy understanding by the respondents. The Researcher also used Interview Guides while dealing with Key Informants. A number of 10 respondents in this category were selected from the Public offices, NGOs, Division Headquarters and CBOs operating within Fort Portal Municipality.

#### **3.2.2.2 Observation Checklists and Photographing.**

The Researcher used his keen eyes and walked around most places in Fort Portal municipality meanwhile making careful observations about the prevailing sanitation conditions, as well as public hygiene standards. In the survey around Fort Portal town, the researcher used Observation Checklists to take records of solid waste disposal facilities, nature of wastes generated in the town, location and availability of public and private latrines/ toilets, water points around the town, and the techniques used in managing waste water in Fort Portal town. Observation Checklists were used to record obvious information and other scientific sanitation matters not best known to respondents. The researcher also visited various food joints and hotels in a bid to establish the hygiene standards.

Photographs could be taken in some instances by the researcher for further references and such photographs have been used in making the final dissertation termed as “plates”.

### 3.2.3 Data design, analysis and processing.

After the researcher had carried out the fieldwork, the data pieces of the Questionnaires, Interview Guides and Observation Checklists were properly arranged. This data was coded with the marked numbers, and a codebook was then designed depicting the data items, their categories like the dependent and independent variables and their respective codes were arranged in such a way that essential patterns of data analysis would be achieved. The analyzed data was compiled using manual Quantitative methods such as statistical formulae for calculating the mean distances (X), the mode (Mo) of respondents, the degrees of response, percentages of respondents, among others. Thus the researcher used the following formulae during Quantitative data analysis.

1. To determine the mean distances (X) between households and variables such as water sources, waste collection facilities for communities, and private/ public latrine facilities availability (proximity), Fisher et al (1991) statistical formula was used as below.

$$\text{Mean (X)} = \frac{\sum f x}{\sum f}$$

Where

**(X) = The mean or average number of respondent**

**fX = The product of frequency of respondents and the number of variable**

**$\sum f$  = Total summation of frequencies of respondents on a given variable**

**X = Total number of variables**

2. The percentages and degrees of the respondents and their variables were Calculated using the formula.

$$\frac{n}{N} \times 100\%$$

Where:

**n = The sample size used by the researcher (response)**

**N = Total sample size (total number of respondents interviewed)**

**N/B: N = 150 respondents.**

The once analyzed data to give out meaningful information was further compiled into statistical tables, pie charts, and frequencies ad graphs. The final recording of the information, which included editing of the research work, was done so that a complete report could be printed out.

### **3.3 Limitations of the study**

The research study was faced with a number of limitations, which included: - The time factor problem since all the three divisions of Fort Portal municipality were reached. Therefore, it was difficult to budget for his time properly due to the delays in traveling from one place to another. In other instances, some respondents interviewed could not disseminate relevant information to the researcher, as some feared to release it and others considered it as wastage of time, while others were illiterate about the questions asked. Language barrier was another problem incurred by the researcher during his study. This was especially noticed in a few places where the researcher could meet those people who do not speak and listen to Runyakitara and English, but could speak and listen to Swahili yet the researcher could not ably speak Swahili unless a translator would be called.

## CHAPTER FOUR RESEARCH FINDINGS AND DISCUSSION

### 4.0 Introduction

This chapter presents analysis and discusses the results obtained from the study. Summary tables showing responses at the different variables over which data was collected are given to enhance a quick understanding of the discussion. Presentation of the findings has been arranged in the order observing the objectives of the study and the respective sections of the questionnaires.

### 4.1 Demographic characteristics of respondents

A total of 150 respondents were used in this research study. 140 respondents filled the general questionnaires and 10 key informants were interviewed using the interview schedules, totaling up to 150 respondents. The sample was evenly distributed using purposive random sampling among the three divisions of Fort-Portal municipality. Therefore, an overall percentage of 56.7% males and 43.3% females were reached in the course of the research study and this shows that the researcher was gender sensitive.

However, most of the respondents were heads of households (40%), business persons (28%), salaried workers (12%), peasants (8%), hawkers (8%) and the least were religious leaders with 04%. Most of the respondents were in the age bracket of 31 – 40 years old (44%) and the least number of respondents, 9% was recorded in the age bracket of 41 – 60 years.

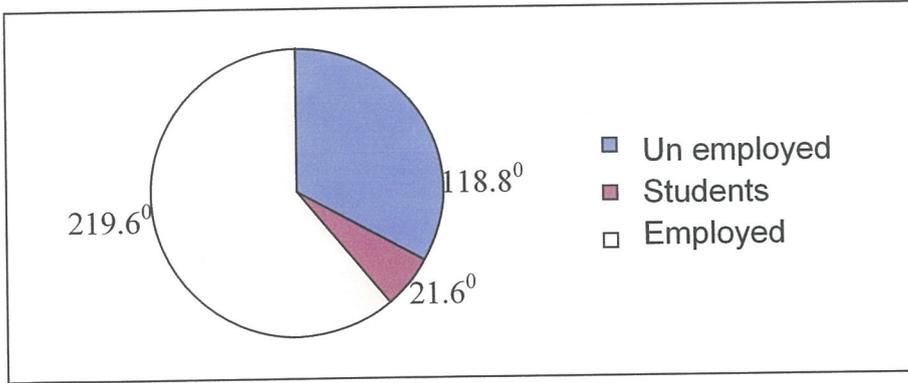
**Table 2: Age of the respondents in percentages**

Age bracket (years)	Percentage
11 – 20	12.7
21 – 30	37.3
31 – 40	44
41 – 60	6
61 above	0
<b>Total</b>	<b>100.0</b>

**Source: Field study by the researcher**

Marital status: 55% of the respondents were married, 24% single and 21% widows, divorced or widowers. Also, most of the respondents were gainfully employed 61%, about 33% were unemployed and 6% were students.

**Fig. 1: Shows details of the employment of respondents.**



Education: Some of the respondents that had reached in upper levels of secondary and tertiary education were 31% and 37% respectively, 21% had acquired primary education, while 11% had not accessed any form of formal education. Majority of respondents 47% lived in Fort portal town on temporary basis because they were tenants, while 33% and 20% of the respondents lived in Fort-portal town on permanent basis because they are land lords / ladies and owners of housed respectively.

The researcher observed that with a greater percentage of the respondents living on temporary basis, this means that majority of the town dwellers may not take serious care of the places in which they live best knowing that any time, they will change the place to another or even go away. Therefore, sanitation improvements in such communities need to be ensured by the authorities in charge through regular inspections and sensitization.

On addition to the above, since the improvement of sanitation facilities has to be realized through accompanying behavioral changes, in particular through the washing of hands after using the latrines / toilets and before using clear and safe water every time. Hence the visiting town authorities in various communalities within the town with no difficulties can enforce these guidelines, thus the study becomes fruitful.

## **4.2 Environmental contaminants in Fort-portal town**

### **4.2.1 Garbage / solid wastes**

The United Nations Development Programme, UNDP report (2005) agrees with the study findings and some how does not agree with the findings.

This is because the report had suggested that solid wastes are regarded to be 70% free from water, which is true for some wastes like institutional or paper wastes, industrial metals and wastes from shops, street sweepings and construction debris. Whereas, it is not true for some wastes, which contain high water contents, for example agricultural wastes, human excreta, household wastes which are more organic, among others.

The type of wastes / garbage in Fort portal town as observed by the researcher fall in various categories as; Household wastes 28% which are mainly organic wastes like banana peels, food left overs and kitchen refuse, 14.7% wastes from shops and market places, 18% agricultural wastes, 10% unprotected human excreta, 10.6% chemical and toxic wastes especially from car parks and hospitals, 4% waste water, 12% wastes from institutions and offices and 2.7% metallic wastes especially from garages and other metallic scraps.

**Table 3: Categories of wastes generated in Fort-portal municipality**

Type of waste	Frequency (n) of respondents	Rank by percentage
House hold wastes	42	28
Wastes from shops and markets	22	14.7
Agricultural wastes	27	18
Unprotected human excreta	15	10
Chemical and toxic wastes	16	10.6
Metallic wastes	4	2.7
Waste water	6	4
Institutional and office wastes	18	12
<b>Total</b>	<b>150.0</b>	<b>100.0</b>

**Source: Field study by the researcher**

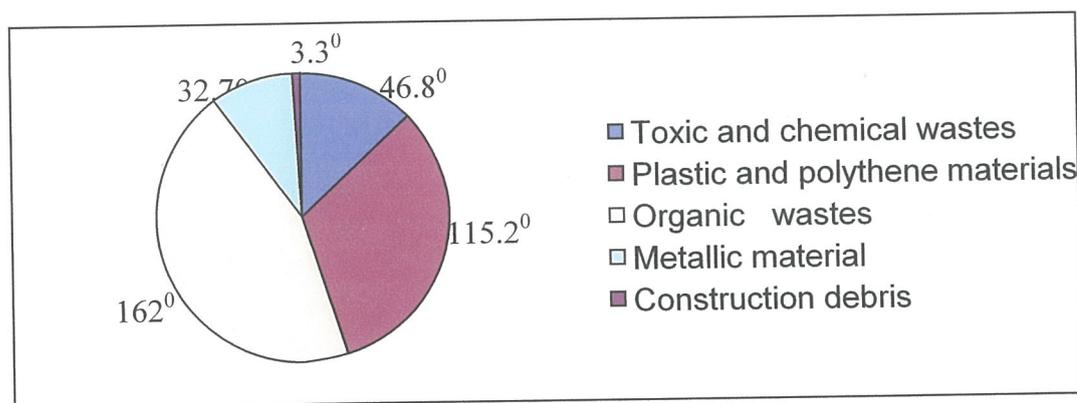
It should be noted that the composition of wastes generated within Fort-portal is 45% organic wastes, 13% toxic and chemical wastes, 32% plastics and polythenes, 9.08% wastes are of construction debris and a least composition of 0.92% is of metallic materials especially car scraps. Such nature of wastes pose a threat of pollution in form of bad smells, leachate flows and also can attract disease vectors in the town such as flies, mosquitoes and stray dogs among others.

**Table 4: Waste composition by percentage in Fort-portal town**

Nature of wastes	Composition by percentage
Organic wastes	45
Toxic and chemical wastes	13
Plastic materials	32
Construction debris	9.08
Metallic materials	0.92
<b>Total</b>	<b>100.0</b>

Source: Field study by the researcher

**Fig. 2: A pie chart showing wastes composition in degrees**



From the research study, it was discovered that the mode of disposal of wastes in Fort portal town included self managed wastes by individual households, waste disposal by Fort portal municipal council and waste management by private providers. However, the majority of respondents interviewed revealed that wastes are mostly self managed at household levels through practices like open incineration, use of sacs and old containers to collect and store refuse.

**Plate 1:A photograph showing the garbage being burnt in an open space, Kacwamba town South division, in KasSusu ward.**



**Source: Field study by the researcher**

Households that have to use Fort portal municipal council solid waste dumping facilities, about 37.8% have to walk within proximity of 100-300 meters to the nearest garbage collection point.

**Plate 2: Below is a photograph showing solid waste disposal facilities in East Division, Fort-portal municipality, near Mpanga market**



**Source: Field study by the researcher**

**Table 5: Distance between households and the nearest waste collection points in percentages**

Distances in metres	Mode of disposal of wastes and the distance in percentages		
	Self managed	Fort-portal Municipal council	Private provider
10 – 50	25	62.5	12.5
51 – 100	40	59	01
100 and more	00	57	10.5

**Source: Field study by the researcher**

The above results imply that Fort portal municipal council solid waste collection points are at least accessible to 62.5% of households.

However, 57% of households find it hard to access the solid waste collection facilities in a distance of more than 100 meters.

Some of the wastes can be thrown into the way before reaching the facilities because of walking a long distance. This can result into unsanitary conditions and contamination of the environment.

**Table 6: Frequency (n) of solid waste disposal by various service providers in Fort-portal town**

Frequency of waste disposal	Solid waste service providers and the frequency of waste collection in percentages		
	Self managed	Fort-portal Municipal council	Private provider
Daily	67	20	43
2 – 3 days	74	63	51
Weekly	30	85	20
After 2 weeks	0.5	10	0.2
Average	<b>42.88</b>	<b>44.5</b>	<b>28.55</b>

**Source: Field study by the researcher**

From the UNDP report (2005), NEMA (2003) and DSOER (2004) Kabarole, all agree with the study findings where it can be seen that 28.55 were served by the private providers, 44.5% by Fort-portal municipal council, 42.88% of respondents managed their own wastes. 85% served by Fort-portal municipal council reported that waste collection was quit not frequent and it used to take a week or more before the waste collection facilities such as garbage skips would be emptied.

In Fort-portal town, transport trucks for garbage are very few hence transport is poorly managed as the garbage goes. Trying off these trucks because they are over loaded and not covered. Lack of garbage collection facilities in the heart of Fort – Portal town has resulted into wastes being dumped in open spaces between premises, from where they are sometimes burnt.

**Plate 3: Solid wastes dumped in an open space between premises in South division, Fort – Portal town**



**Source: Field study by the researcher**

### 4.3 Factors responsible for poor sanitation in Fort-portal town

The findings of the Ministry of Health (1991) agree with the study findings as far as the factors that cause poor sanitation in Fort portal municipality are concerned.

Findings revealed that accessibility to adequate latrine facilities was given as a factor responsible for poor sanitation in Fort portal town. This was due to the price charged per every entry into the latrine by an individual, 100/=, which would not be afforded by some individuals in the town.

The study findings also revealed that public latrines are not adequately located especially in busy places like markets and vehicle parks. They are either had to find by new entrants in the town because of being located behind buildings and kiosks without necessarily putting sign posts to show their existence. Table 7 shows how different individuals responded to various factors that are responsible for poor sanitation in Fort-portal municipality, represented in frequencies (n) and as percentages.

**Table 7: Factors responsible for poor sanitation in Fort-portal**

<b>Factor</b>	<b>Frequency of respondents(n)</b>	<b>Percentage of respondents</b>
Difficulties in pit latrine / toilet accessibility	71	47.3
Poverty	43	28.7
Neglect of responsibility by relevant authorities	26	17.3
People's attitudes	10	6.7
<b>Total</b>	<b>150.0</b>	<b>100.0</b>

**Source: Field study by the researcher**

Poverty is another factor, which was revealed by respondents. Most of sanitation facilities require adequate capital, for example, digging up of good pit latrines, construction of good latrines require cement, roofing materials, bricks and sand which require a lot of money. Hence many people in Fort-portal town cannot afford construction of better latrines or toilets.

Negligence of respondents by the relevant authorities especially Fort-portal municipal council and district director of health services (DDHS) is another factor contributing to poor sanitation in Fort-portal municipality. This has been evidenced especially as regards solid waste management. For example, some respondents in Fort portal town complained that Fort portal municipal council takes long time to empty the waste collection facilities such as garbage skips from their communal dumping sites. This has led to decaying of garbage characterized by foul air and flies. In other instances, the researcher could observe solid wastes dumped just in open spaces, between premises in the heart of the town and this implicated that there were no enough garbage skips around the town, hence leading to poor waste management.

Peoples' attitudes towards sanitation issues coupled with low incomes and difficulties in construction and accessing the public sanitation facilities have greatly contributed to poor sanitation standards in the town. People think that they should use the little money available to do more profit earning activities other than toilet / latrine construction. This perception requires combined efforts by local authorities and municipal council to carry out sensitization campaigns in order to create awareness amongst the town population on the dangers of poor sanitation conditions.

**Table 8: Peoples' perception on sanitation conditions in Fort-portal municipality**

<b>Response</b>	<b>Frequency (n) of respondents</b>	<b>Percentage</b>
Poor	60	40
Fair	68	45.3
Good	22	14.7
<b>Total</b>	<b>150.0</b>	<b>100.0</b>

**Source: Field study by the researcher**

From the findings of Morgan (1990) and Birley (1995), all agree with the study findings which indicated that 40% of the respondents remarked that the sanitary conditions in Fort portal town was poor, being attributed to poverty, negligence of responsibility by the relevant authorities, inaccessibility to public toilets / latrines, lack of enough solid waste disposal facilities and lack of awareness among others.

However, 45.3% of the respondents during the study interviews revealed that the sanitation standards in the town were fair, while only 14.7% of the respondents remarked that sanitation conditions in the town were good as shown in table 16 above.

#### **4.4 Effects of poor sanitation on people and the environment in Fort portal town**

From the findings of Aurther (1999), Birley (1995), Morgan (1990) and the Kabarole district monthly epidemiological reports of September 2006 – February 2007, all agree with the study findings, which indicate that the sanitation was poor. Poor sanitation thus has a number of positive and negative effects on the public health and the environment at large. Negative effects of poor sanitation include; diseases, bad smells, aesthetic problems, water and land pollution and other visible effects on the environment such as climatic changes, while the positive ones include; attraction of donor agencies and creation of employment opportunities for people who are involved in the clean up services.

##### **4.4.1 Negative effects on poor sanitation**

**Table 9: Shows various negative effects of poor sanitation on the people and the environment in Fort-portal municipality.**

<b>Effect</b>	<b>Frequency (n)</b>	<b>Percentage</b>
Bad smell (air pollution)	20	13.3
Diseases	114	76
Aesthetic effects	03	2.0
Water pollution	10	6.7
Environmental changes	03	2.0
<b>Total</b>	<b>150.0</b>	<b>100.0</b>

**Source: Field study by the researcher**

##### **4.4.1.1 Diseases**

The study findings have agreed with those of Godman (1962) and the Uganda country programme (1991) which showed that inadequate sanitation and accumulation of refuse has led to the proliferation of flies and mosquitoes, leading to the outbreak of diseases; malaria, diarrhea, dysentery and cholera in such an urban community.

These have claimed lives of people. Other diseases that were reported to be affecting the people in Fort portal town due to poor sanitation and other public health conditions were typhoid, cough, skin diseases, eye infections, flue and were mainly as a result of open dumping sites in some areas of the town, which provided breeding grounds for flies, which commute between the waste dumped, pit latrines and households where food is prepared. Table 10 above shows that 76% of the respondents attributed this disease to poor sanitation

**Table 10: Shows a monthly epidemiological report for Katojo hospital in west division, Fort-portal municipality for the month of January 2007**

Disease (diagnosis)	0 – 4 years		Over 5 years	
	M	F	M	F
Animal bites	02	00	10	07
Cholera	00	00	08	05
Dysentery	00	00	03	00
Guinea worm	00	00	00	00
Malaria	01	23	275	64
Measles	00	00	00	00
Neonatal tetanus	01	00	00	00
Diarrhea acute (not bloody)	01	02	44	08
Intestinal worms	01	02	60	19
Typhoid	00	00	00	01
Other infectious diseases	04	06	162	38
<b>Total diagnosis</b>	<b>26</b>	<b>33</b>	<b>562</b>	<b>145</b>

**Source: HMIS 105, Medical Department Kabarole 2007**

#### 4.4.1.2 Bad smell

The findings of the study revealed that about 20 people out of 150 town dwellers in Fort portal who represented 13.3% of the respondents are exposed to foul air that emanates from the smelly public latrines, broken sewage pipes, decomposing solid wastes, sewage lagoons near the bus park in south division, among others. Bad odor was very evident in areas near the communal waste dumping sites especially near Mpanga market, and this was mainly from the decomposing organic matter, and also from human excreta mainly urine smell in the surrounding bushes.

#### *4.4.1.2 Aesthetic effects*

Study findings agree with those of Authur (1999) which indicated that the town dwellers were facing aesthetic problems as a result of open waste dumping sites in various places around town, stagnant waste water most especially when it rains and sewage dams which are located in the heart of the town.

#### *4.4.1.3 Water pollution problem*

The findings of the study agree with those revealed by the World Bank technical paper No. 121, and those of global water and sanitation assessment report 2000, which stated that the most serious water pollutants in terms of human health worldwide were pathogenic organisms. Infectious diseases caused by pathogenic bacteria, viruses and protozoa or by parasites are all the most common and wide spread health risks associated with polluted water.

The respondents in Fort portal during research interviews with the researcher revealed that there were several threats that could lead to water pollution in the town. These threats were mainly linked to the kind of activities taking place in the town, waste disposal, sewage works and human excreta disposal around town. Kabarole district being hilly and mountainous, there is degradation of hill sides through ploughing and grazing, leading to siltation of rivers that drain down from Rwenzori mountains through Fort-portal town. For example River Mpanga and Mugunu.

About 28% of the respondents revealed that pollution of water in the municipality was rampant resulting from open car washing bays which are located on river / stream banks. The petroleum products of oils and grease from car engines are washed into the water sources.

**Plate 4: Shows a car washing bay located along river Mpanga in west division, Fort portal**



**Source: Field study by the researcher**

Some respondents, 26.7% cited out the main cause of water pollution in Fort-portal town to be uncontrolled human excreta disposal. That some town dwellers deliberately urinate along the river banks, especially river Mpanga and others throw their faces into the water sources. 25.3% of the respondents revealed that water pollution in Fort-portal town is as a result of uncontrolled waste disposal, almost every where around town. These wastes decompose releasing leachates into the nearby sources of water. In fact, some respondents revealed that river Mpanga is in particular being polluted by the slaughter slabs from the Kabundaire abattoir. Others stated that the many mushrooming car washing bays which they claimed were developed without carrying out thorough environmental impact assessment (EIA), contrary to the promises of National Environmental Act, Cap 153, chapter IV.

They are therefore illegal and there is need for environmental improvement notices to check on their activities in compliance with the National Environmental Act (1995), cap 153.

The study findings also agree with those of William C. Saigo (1990) which indicated that the major categories of water pollutants fall under infectious agents, organic substances,

inorganic chemicals, radioactive materials and other human related activities as shown in table 11 and 12 below respectively.

**Table 11: Major categories of water pollutants in Fort-portal municipality**

Category	Examples	Activity / sources
Infectious agents	<ul style="list-style-type: none"> <li>- Bacteria</li> <li>- Viruses</li> <li>- Parasites / vectors</li> <li>- Protozoans</li> </ul>	Human and animal excreta (uncontrolled)
Organic substances	<ul style="list-style-type: none"> <li>- Agricultural pesticides</li> <li>- Plastics such as polythenes</li> <li>- Detergents (from waste water)</li> <li>- Oils and grease (from vehicle engines)</li> </ul>	<ul style="list-style-type: none"> <li>- Industrial / machinery outputs</li> <li>- Household wastes</li> <li>- Agricultural chemicals</li> <li>- Urban wastes.</li> </ul>
Inorganic chemicals	<ul style="list-style-type: none"> <li>- Acids</li> <li>- Caustics</li> <li>- Salts and metals</li> </ul>	<ul style="list-style-type: none"> <li>- Industrial effluents</li> <li>- Household cleansers</li> <li>- Surface water runoffs.</li> </ul>
Radioactive materials	<ul style="list-style-type: none"> <li>- Iodine</li> <li>- Presence of ammonium compounds</li> <li>- Metals</li> </ul>	<ul style="list-style-type: none"> <li>- Mining and processing of ores like limestone in west division o the municipality</li> <li>- Other natural resources</li> <li>- Plant nutrients</li> </ul>
Oxygen demanding wastes	<ul style="list-style-type: none"> <li>- Animal manure</li> <li>- Human excreta</li> <li>- Plant residues</li> </ul>	<ul style="list-style-type: none"> <li>- Sewage</li> <li>- Agricultural run offs etc</li> </ul>

**Source: NWSC Fort Portal branch**

**Table 12: Activities that mainly contaminate water sources in Fort portal by percentage**

<b>Acidity</b>	<b>Frequency (n)</b>	<b>Percentage of responses</b>
Disposal of wastes	38	25.3
Car / vehicle washing bays	42	28
Waste water and runoffs	14	9.3
Agricultural activities	10	6.7
Human and animal excreta	40	26.7
Directly using a water source like swimming, suicide	6	04
<b>Total</b>	<b>150.0</b>	<b>100.0</b>

**Source: Field study by the researcher**

#### **4.4.1.4 The environment**

The findings agree with the United Nations (UN, 2000) report, UNDP report (2005) and NEMA (2000) report, all which indicated that 10.1% of the respondents reported that hazardous and toxic wastes when realized into the environment, cause such health problems as birth defects, neurological disorders, reduced resistant to disease infectious and other effects. Environmental changes in Fort-portal town that are due to various activities could result into environmental damages of water contamination, air pollution, toxic release of substances onto the land and declining crop production, and health problems of the people.

#### 4.5 Sanitation facilities in Fort Portal town

A number of sanitation facilities available included; Public latrines and Private latrines.

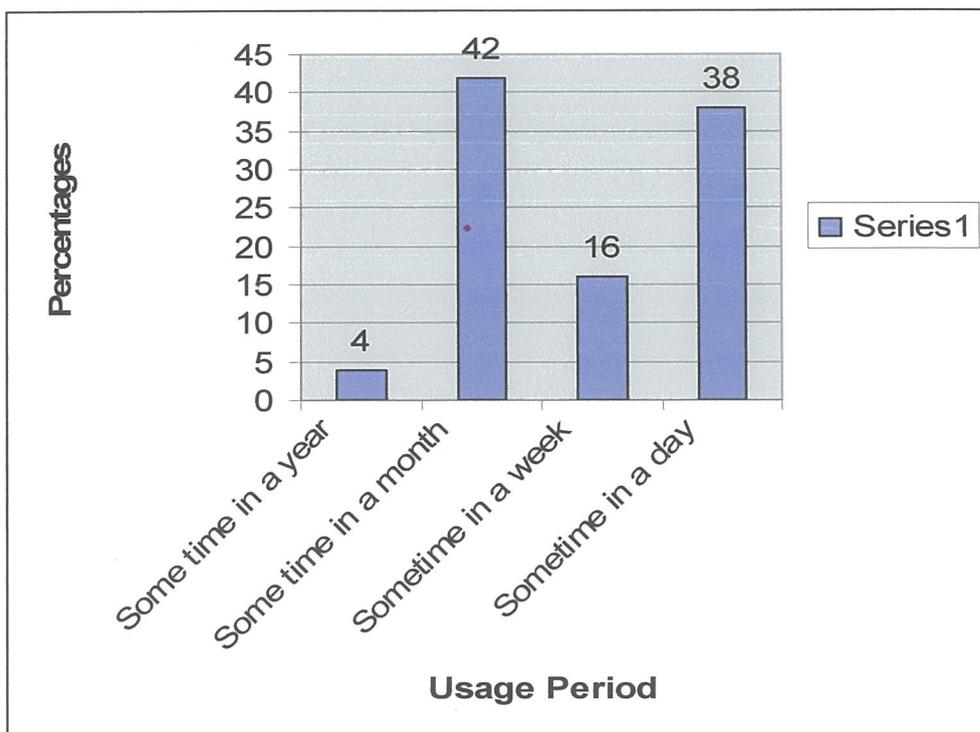
These once not used appropriately can result into pollution effects of land, surface water sources and bad smells into the surroundings. The research study established that there is low frequency of utilization of public toilets / latrine facilities in Fort portal town. About 38% of the town dwellers only access the public latrines daily. This could be because public latrines or toilets are poorly distributed and are located in places, which are not centrally positioned for easy accessibility by the town dwellers.

Therefore, many vendors and traders have to walk long distance to reach the Public toilets / latrines as revealed by the respondents in Mpanga market, East division during the research interviews.

The above factor has led to the use of so called “flying latrines” (use of polythene bags in some instances) by people who at the end of the day may throw them in the near bushes, which may eventually drain into existing water sources when it rains. These findings agree with the findings of Esrey (1998) which indicated that sanitation practices promoted today of fall either under “flush and discharge” or “drop and store”.

Another factor for inadequate latrine / toilet accessibility by town dwellers is the expensive charge per every visit to a public latrine / toilet by an individual. The researcher was informed by the respondents that a person is supposed to pay 100/= or sometimes 200/= every visit to the latrine / toilet.

**Fig. 3: A graph showing the usage pattern of public latrines / toilets in Fort-portal town**



Further still, the findings of the world resource institute (1996), agrees with the findings of the study which indicate that both private and public latrines / toilets are available in Fort portal town, though not adequate to satisfy the whole population.

This however portrays that the largest 86% of people have access to latrines / toilets in some days of the week and only 14% of people have no access to toilets / latrines as revealed by respondents. This means that the minority of the town dwellers in Fort portal continues to face problems of accessing sanitation facilities. These therefore end up using bushes, polythene bags, which expose the surroundings to unsanitary and unhealthy conditions.

**Table 13: Summarizes the percentages of respondents during the research interview**

Latrine / toilet response	Frequency of respondents	Percentage
Yes	129	86
No	21	14
Total	<b>150.0</b>	<b>100.0</b>

**Source: Field study by the researcher**

#### 4.5.1 Type of latrines in Fort portal municipality

The findings of the world resource institute (1996) agree with the study findings, which suggest that the commonest human excreta disposal method is by using pit latrines. In Fort-portal town, most latrines are shared and as many as 10 households share one facility. As observed by the researcher, most toilets / latrines do not have vent pipes and they are smelly, made up of temporary building materials of mud, sand and wooden poles which can rot due to termites and fungal attacks. Sometimes, it is the old iron sheets, which are used in roofing of such latrines. It should be noted that such latrines are a hazard to the health of the people due to bad odors that arise from them and also being breeding grounds for disease vectors like mosquitoes that cause malaria and flies, which can contaminate food in the neighborhoods.

Another type is the ventilated improved pit latrines (VIP) and these have ventilation pipes for drawing out foul air / smell and bringing in fresh air. The ventilation pipes control the smell and the number of flies leaving the latrine, thus reducing such latrine risks of becoming a source of problems in Fort portal town.

Water flush toilets are the most efficient systems of disposal of human excreta. However, very few households and offices in the town are connected to this system by the national water and sewerage co-rporation (NWSC). This is because of the expenses involved in the installation and operating such toilets.

**Table 14: Distribution of house holds in Fort-portal town by type of toilet / latrines facility**

Type of toilet / latrine facility	Respondents in percentages
VIP latrine private	1.5
Flush toilet shared	7.0
Covered pit latrine shared	64.3
Covered pit latrine private	16
VIP latrine shared	0.6
Flush toilet private	7.6
No toilet	03
<b>Total</b>	<b>100.0</b>

**Source: Field study by the researcher**

From table 14 above, it can be observed that majority of households, 64.3% in Fort portal town use covered pit latrines shared.

These respondents were either tenants or sometimes owners of houses but surviving on sharing a latrine. About 3% of the respondents did not have human excreta disposal facilities. In general, there are about 16.7% of the water borne toilets / latrine systems and only 1.5% VIP latrines that are privately owned, 7% flush toilets shared, 7.6% flush toilets privately owned and 0.6% VIP latrines shared. The safe pit latrine coverage in Fort portal municipality is now 80.3% of both shared and private latrines and only 3% of the town populations do not have access to any type of latrines.

The above results however indicate an improvement in the safe latrine coverage in Fort portal municipality from 67% according to the district state of environment report 2004, Kabarole to 80.3% established by the research study.

Also, the district state of environment report, 2004, Kabarole had established that 13% coverage was of water borne toilet systems. Hence, the results of the research indicate that there is an increase in the coverage of water borne toilet systems in Fort portal municipality up to 16.7% by 2007.

#### **4.5.2 The number of people sharing one latrine or toilet in Fort portal**

The findings of the national environment information centre (1993), agrees with the research study findings which indicates that the majority of the population in Fort portal town (60%), who range between (10 – 20) persons share one traditional pit latrine / toilet, whereas 33.3% of the respondents who range between (5 – 10) persons stated that they share one flush water toilet. Those persons in both private and public offices especially revealed this. And only 6.7% of the total respondents in Fort portal municipality revealed that they share one VIP toilet / latrine.

Table 15 below makes a summary of the frequencies and percentages of people sharing one latrine / toilet.

**Table 15: Number of people sharing one toilet / latrine in Fort portals**

Range of people	Frequency of respondents	Percentage
1 – 5	50	33.3
5 – 10	90	60
10 – 20	10	6.7
<b>Total</b>	<b>150.0</b>	<b>100.0</b>

Source: Field study by the researcher

#### 4.2.3 Assessment of satisfaction of sanitation facilities in Fort Portal

**Table 16: Satisfaction of sanitation facilities by percentage of respondents.**

Assessment criteria	Completely satisfied	Partially satisfied	Dissatisfied	Total
Cleanliness of facilities	50	46	4.0	<b>100.0</b>
Affordability	43	16	41	<b>100.0</b>
Safety	40	38	22	<b>100.0</b>
Management of facilities	50	36	14	<b>100.0</b>
Privacy / location	55	42	3.0	<b>100.0</b>
Accessibility	42	35	23	<b>100.0</b>

Source: Field study by the researcher

The criteria used to assess satisfaction with sanitation facilities such as latrines or toilets were cleanliness of the facilities, affordability, safety, management of the facilities, privacy or location and accessibility of the facilities shown in table 10 above as variables to consider.

50% of respondents were completely satisfied with cleanliness and management of sanitation facilities. About 43% and 42% of respondents however, reported that the public latrines / toilets were not affordable due to high prices of fee charged per every visit to the public latrine / toilet, and that they were inaccessible for the users respectively.

According to Fort-portal municipal authorities, public latrines / toilets are meant to serve the entire population of the town, but on conditions that an individual has to pay Uganda shillings 100/= per visit.

This implies that a daily customer in Fort portal town to these public facilities spends 3000/= per month, and in a year, this person spends 36,000/= which seems to be expensive to most users. Some authorities in the town that many potential users cannot afford or are not willing to pay for these public sanitation facilities informed the researcher. They instead resort to using alternative methods of human excreta disposal such as disposing their excreta into the nearby bushes or corridors of buildings during the nights or sometimes use polythene bags where faeces are tied and thrown alongside the roads. These results therefore concur with the findings of Esrey (1998), who indicated that sanitation practices promoted today fall either in “flush and discharge” or “drop and store”.

The majority of the public latrines / toilets especially those around car parks, Tax Park and market places like Mpanga market are dirty and poorly maintained, with a lot of unwelcome smells produced. The cleaning detergents used are not adequate and in some cases, the flushing systems are non-functional. Toilet papers provided to the users are of poor quality and sometimes water connections get blocked into these public toilets, contributing to the bad odors produced from these public toilets. This creates threats of air pollution in the environment and even affects the business community operating around such a public toilet.

#### **4.5.3 Water supply and Sanitation in Fort Portal Municipality**

According to the district state of environment report April 2004, Kabarole, majority of the urban population access piped water supplied by the national water and sewage corporation (NW&SC), and the water coverage was about 81% while sewage coverage was at a low percentage of 0.1%. This report relatively agrees with the study findings. The findings of UNDP (2005) report and the water and sanitation sector performance report (WSSPR, 2005) revealed that the main source of water is surface water and that 88% of the urban dwellers obtain drinking water from protected sources.

These agree with the study findings, which established that about 55.3% of the households own a piped water connection in house. 22.7% of the house holds in Fort portal town access water boreholes although at some price per jerican of water.

Nearly 89.3% of the population in Fort portal town have access to a public tap, stand pipe or borehole even when they do not own the connection. This percentage almost concurs with the 88% of urban dwellers obtaining water from protected sources as stated by the national water and sanitation sector performance report (2005). Table 17 below shows sources of water in Fort-portal town by percentage.

**Table 17: Sources of water in Fort-portal municipality by percentage**

Type of source	Frequency (n) of respondents	Percentage
Piped water connection in house	17	11.3
Bore holes	34	22.7
Protected springs	00	00
Piped tap water	83	55.3
Well / river	16	10.7
<b>Total</b>	<b>150</b>	<b>100.0</b>

**Source: Field study by the researcher**

From table 17 above, it is observed that the main source of water for most households in Fort portal town is piped tap water.

However, the study findings are further in line with the water and sanitation sector performance report (2005). It stated that challenges for the provision of safe water and sanitation are getting harder due to rapid population growth, increased urbanization, increased industrial activities, poverty especially in urban slum areas and the increasing habits of environmental degradation.

**Table 18: Accessibility of people to public water supply by division in Fort-portal municipality by percentage**

Division	Respondents in percentage responses			Total
	Yes	No	Not stated	
South	66.7	20	13.3	<b>100.0</b>
East	63.4	32	4.6	<b>100.0</b>
West	70	21.9	8.1	<b>100.0</b>

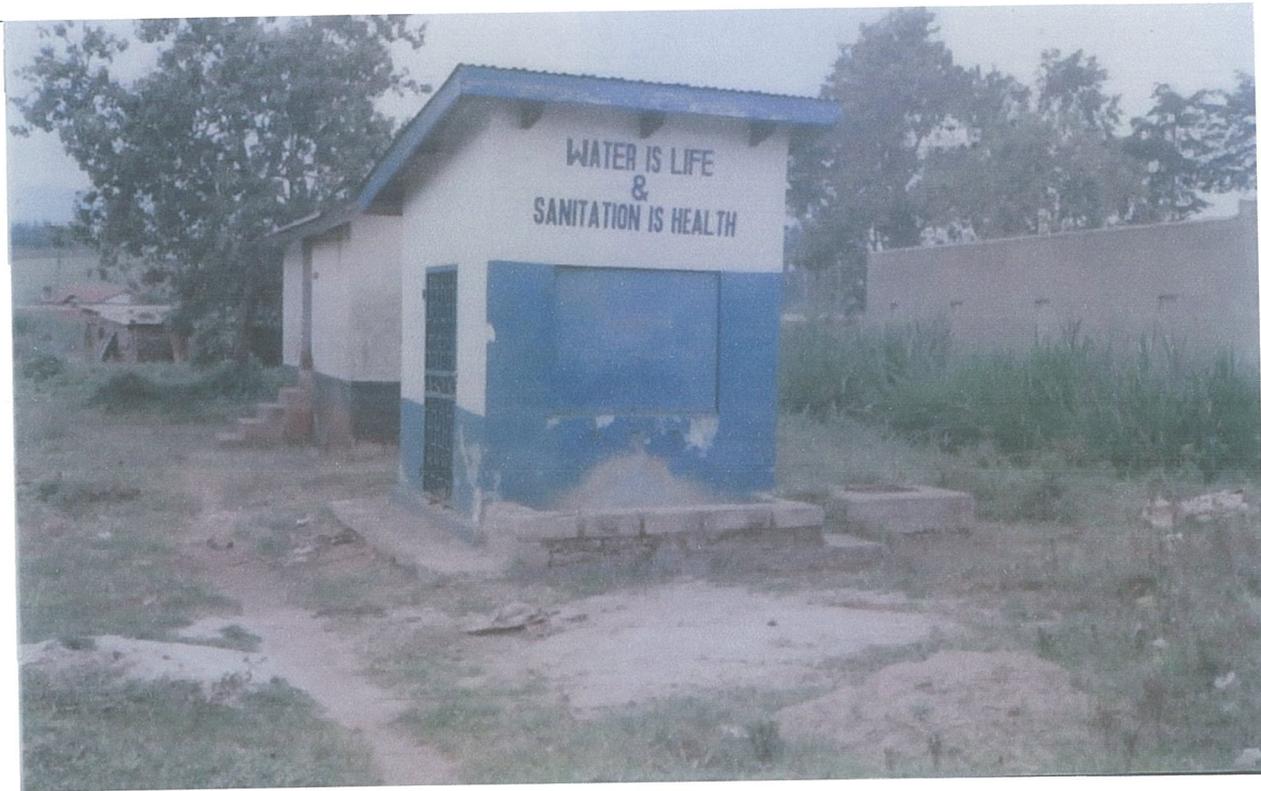
**Source: Field study by the researcher**

Table 18 above indicates that the greatest percentage of people (70%) in west division have access to public water supply either by pipe connections, stand water pipes or boreholes. This is because most houses in this division are permanent or semi-permanent residential houses, built with necessary facilities hence making it easy to make water pipe connections by the national water and sewerage co-operation. 66.7% of people accessing public water supply was registered in South division. A decrease in the percentage of accessibility of public water supply in South division as compared to the west division is due to the mushrooming slums that are being developed with no proper housing construction most especially in Kesenyi zone.

Some people here survive from natural streams such as the Mugunu stream. However, the greatest percentage of people 32% who do not have access to public water supply was found in East division of Fort portal municipality. The reason for this was that many households in East division appear sparsely distributed and extend relatively into the villages such as Bukwali and Kitumba-Njara zones where water pipe connection seem expensive. Some people here survive on wells and river water such as river Mpanga. However, the researcher was informed by municipal authorities that plans are on-going with the national water and sewerage co-operation to ensure that safe water connections are established in all parts of the municipality and even beyond.

The research further established that the network coverage of public water connection which was 26 kilometres in 1997 has now grown to 70 kilometres with 1773 active water connections and 79 kiosks / public stand pipes. With a deliberate anxiety to increase service coverage, the national water and sewerage corporation Fort portal has made water extensions to Kiamara and Mpanga tea estates, Karambi, Butebe, Kasinde, Kyakaigo, Musoma, Futibutangwa, Bulyanyeje, all outside and neighboring Fort portal municipality. Plate 5 below shows a stand water pipe / kiosk for public in west division of Fort-portal municipality.

**Plat 5: A photograph of one of the public kiosks / water stand pipes in West – division in Fort-portal municipality**



**Source: Field study by the researcher**

Some respondents revealed that the major constraints in accessing safe water in a decreasing order were; High costs of water connection, inadequate sources of water supply resulting in congestion at the water sources like at boreholes and long distances to the water sources. Table 13 shows the estimated average distances walked by people to the nearest water sources in percentages.

The study revealed that the estimated walking distance to the nearest public water source is between 100 – 200 metres. Nevertheless, 21.8% of the respondents revealed that some household members walk far long distances more than 300 metres. This is yet in gross contradiction to the national water policy (1997) which sets a walking distance to the nearest water source to be 20 metres.

**Table 19: Estimated average distance of house holds to the nearest water sources in Fort-portal**

Distance in metres	Respondents in percentages		
	Stand pipe Wells	Borehole	Others eg
Between 10 – 100	45.4	54	75
100 – 200	25	36	20
200 – 300	16.3	1.5	4
More than 30	13.3	8.5	1
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

**Source: Field study by the researcher**

#### 4.6 Challenges facing the present sewage facilities in Fort Portal Municipality

The study findings revealed that the municipality has sewage facilities that are run and operated by the national water and Sewerage Corporation. The national water and sewerage co-rporation management Fort portal branch that there were 64 active sewer connections and total sewer length of one kilometre in part of the town centre informed the researcher. And that waster water in collected through this one kilometre main sewer line to a communal septic tank and sewerage lagoons located on Bahiiha road in Kisenyi next to the bus park, in south division. The sewage lagoons consist of two anaerobic ponds in parallel, followed by facultative ponds in parallel, and finally the maturation pond. These results agree with those of the district state of environment report (2004), Kabarole.

**Plate 6: Sewage lagoons on Bahiiha road in Kisenyi Fort-portal municipality**



**Source: Field study by the researcher**

The treatment is a natural physical biological process and is very effective as the effluent usually meets NEMA discharge requirements with the exception of nutrient removal. The informant respondent from national water and sewerage co-rporation revealed that the effluent from maturation sewage pond is discharged to river Mugunu down stream,

which finally drains into the main river Mpanga. The respondents further stated that the design capacity of the sewage plant is not known but at present, effluent is low and on average 1600m<sup>3</sup> / month can be collected. However, the findings of the study demonstrate that there is need to expand the sewer coverage in Fort portal town centre so as to cater for the new upcoming buildings and to respond to the increasing effluent generation, due to the increasing population.

Another challenge noted by the research was that the sewage lagoons are located in a place that may inconvenience the public by the bad smells since the ponds were constructed next to buildings. Therefore, it would be prudent for the general public in Fort-portal town if the sewage lagoons are re-located in an area that is convenient to the general public.

Also, the Cess pool emptier services for households using septic tanks are not enough, thus more provision of Cess pool vehicles to the national water and sewage co-operation in Fort portal can effectively enable the authorities manage the sewage in the town, its collection and transportation can be ensured in time.

#### **4.7 What has been done to ensure good sanitation in Fort-portal Municipality?**

The research findings agree with those of UNDP (2005) report and those of DSOER 2004, Kabarole which stated that majority of the urban population in Fort-portal access piped water supplied by the national water and sewerage corporation and the water coverage is about 81% while sewerage coverage was at a low percentage of 0.15%.

The research established that Fort portal municipality has growth opportunities for water extension services and the new connections are planned as a result of the increased awareness of the population by the NWSC team through radio programmes such as on voice of Toro (VOT), field group movements, and strategic alliance meetings with the municipal authorities. The manager, NWSC Fort-portal branch revealed that the new water connections are efforts aimed at providing safe and clean water to the population in Fort-portal town, as one way of reducing the risks of water borne infections.

This was in accordance with the Fort-portal NWSC Vision statement, which also stated “To be a world class utility, which provides effective and efficient water and sewage services to improve the quality of life of the people in a sustainable manner”.

In another bid to improve sanitation standards in Fort-portal municipality, municipal authorities in the three divisions have made their objectives and designed procedures of achieving them. During the research interviews using the interview schedules for informants, the researcher was informed that, there has been on going sensitization of the communities in the town on hygiene and sanitation and safe water.

Also that there were further plans by the municipal authorities to make new piped water extensions to ever cell and construction of shallow wells and protected water springs. Public toilets or latrines have been constructed, although the researcher observed that these latrines were not adequate.

The Authorities from the office of assistant town clerk south division also revealed that the municipality has procured for garbage skips and dust bins which are planted in various places around the town. However, the respondents revealed that garbage disposal and collection has not been well handled due to the increasing number of new open dumping sites by the increasing population, even in places where the skips and containers are not planted. This has caused a major problem of solid waste management in the town, where many people have resorted to open incineration of the garbage. On the other hand, the municipal authority tries to employ workers to manage and collect solid wastes around the town daily or weekly and use the waste collection vehicle to dispose the wastes to Mukaburara crate valley and sometimes to a forest North–East of Boma.

However, the researcher was not informed of the percentage of annual budget of the municipality that is devoted to garbage management or otherwise provision of proper sanitation facilities. Table 20 below shows how members of Fort portal municipality have been trained on issues related to good sanitation and keeping clean water for domestic consumption are concerned.

**Table 20: Fort-portal municipal divisions training cases for the year 2006 / 2007**

Area of training	No. of staff trained	Category of staff trained
Water sanitation and domestic hygiene	12 (from all the divisions)	- Health inspectors - Health assistants
Urban rules	20 (from all divisions)	- Town engineers - NWSC staff (3)
Garbage handling	15 (from all divisions)	- Religious teachers - The community - Local leaders

**Source: Offices of A.T.C Fort-portal municipality**

From table 20 above, it is evident that there has been community sensitization on how to keep good sanitation through methods such as workshops and seminars for stakeholders.

A part from the municipal authorities in Fort-portal town ensuring good sanitation, there are other NGOs and private organizations that also join in hands to answer better sanitation standards of the town.

They include private providers like Kabarole Resource and Research Centre (KRC), which gives trainings and sensitization programmes in human rights that also looks at personal hygiene, as a human right. Thus, such trainings are in accordance with the constitution of the Republic of Uganda 1995, Article 39 (4) and Cap 153, volume 3, which asserts that “every Ugandan has a right to a clean and healthy environment”.

Other NGOs involved include: Joint efforts to save the environment (JESE), Foundation for rural development (FORUD) – involved in sustainable agricultural practices and technologies and promotion of access to clean water, hygiene and sanitation, among others.

## CHAPTER FIVE

### 5.0 Conclusion and Recommendation

#### 5.1 Conclusion

Urbanization and development, and associated population growth, infrastructure and service demands often result in corresponding demand and pressure on the environment, resulting in deteriorating environmental conditions.

Thus, this research to find out the effects of poor sanitation on Public health and the environment based its focus on several objectives as: To identify the environmental contaminants, factors responsible for poor sanitation conditions, effects of environmental contaminants on the people's health and the environment, challenges facing the present water and sanitation facilities; garbage handling facilities, and to examine the efforts that have been put in place to deal with environmental contaminants, hence improve sanitation.

Among the most common contaminants identified during the study included: indiscriminate solid waste disposal especially in open places and this was because of lack of adequate disposal facilities for safe waste disposal, waste water and water runoffs from markets, hotels and homes, agricultural wastes, human excreta resulting from inadequate public latrine facilities and other activities like Car washing and Kabundaire abattoir.

Some of the factors causing poor sanitation in Fort Portal town were; lack of enough solid waste disposal facilities such as skips, containers and waste recycling plants, lack of waste transportation vehicles (so far the town has only one and old vehicle), poverty because some people cannot afford to pay for the installation of clean and piped water, fewer public latrines around town and lack of funds by the authorities to pay for the costs needed in ensuring better services.

Some cases of disease prevalence in Fort Portal Municipality which included malaria infection which was the highest 57.03% and other infectious diseases such as animal bites, Cholera, trachoma, typhoid, dysentery, and schistosomiasis which constituted 42.97% were identified by the respondents to the researcher. Such cases could have been as a result of using unsafe and contaminated water with bacteriological or chemical contamination, inadequate availability of public latrines / toilets, poor handling of solid wastes with fewer garbage skips and

collection vehicles, lack of community awareness of the prevention and control of diseases and the reluctance of relevant Municipal authorities.

The researcher found out that in Fort Portal Municipality, plans to backup good hygiene and sanitation standards in a bid to enhance public health and a cleaner environment are undertaken. More funding of these plans is needed in conjunction with enforcement and formulation of strict byelaws to ensure their implementation. Also, awareness creation and education of the general public through capacity building workshops, seminars, radios, worship places and public gatherings can as well be a tool in promoting public health as well as the general sanitation of Fort Portal Municipality

## **5.2 RECOMMENDATION**

### **5.2.1 Proper solid waste disposal and management**

As it was established in the research study findings of chapter four, the problem of solid waste disposal and management in Fort Portal municipality is a crucial issue among others and need to be taken into consideration by focusing on the following:

### **5.2.2 Public Participation**

Involvement of the private sector, municipal communities and NGOs. Due to the complexities and difficulties surrounding securing of appropriate landfill sites and given that increasing amount of solid waste are bound to be generated with time, the economic constraints of managing the wastes call for increased, community and NGOs participation as the only sure way to attain greater scope for sustainable solid waste management in Fort Portal. Communities can contribute greatly towards reduction of the proportion of wastes requiring landfill disposal through becoming aware of their individual contributions to solid waste management. For example, municipal communities can modify individual habits to reduce the overall volume of solid wastes to be generated. Organic waste recovery can help to reduce the overall volume of solid wastes to be disposed off in sanitary landfills, thus reducing organic waste transportation and disposal costs. This will also encourage the conversion of wastes to other useful purposes and prolonging the lifespan of the landfill sites established.

It is important that the interest and participation of any NGOs and community based associations, independent institutions and individuals who might have already put in place programmes to address waste management issues be harnessed, while others not yet involved should be encouraged to participate.

### **5.2.3 Landfill development**

Because most municipalities in Uganda will continue to rely on land filling as the most readily available option for waste disposal, it is prudent therefore that Fort Portal municipal council action plan should also include a component for enhancing the capacity of the municipality for identification and development of legal landfill sites, as well as for support to carry out environmental impact assessments for identified sites

This will help to also reduce on the waste accumulation and their associated problems in Port Portal town. Need for major generators of wastes (for example markets, schools/ institutions to manage their own wastes through developing institutional frameworks and self regulations such as bye-laws for waste management.

Prioritization of waste management in the municipal environment action plan and budget allocation and commitment of stakeholders in terms of providing finances, time and materials to implement planned activities will help to enhance better solid waste management in Fort-Portal municipality. For example, at the time of research, only one waste collection vehicle was available for Fort Portal municipality, yet the waste generation rate was doubling. Therefore, there is need for procurement of more garbage correction vehicles and other equipments like garbage skips.

### **5.2.4 Maintenance of Human excreta**

Much needs to be done to streamline the establishment and maintenance of public latrines / toilets in Fort Portal town. More latrines need to be built in some strategic locations so as to reduce on the risk of human excreta disposal in open places or by other means. There is also need for financing the maintenance services of already existing latrines / toilets especially by providing enough soap water chemicals to clean and treat the latrines.

There is still need to re-plan and re-allocate Fort portal sewage lagoons from the heart of the town, which may at any one time be hazardous to the surrounding population.

### **5.2.5 Waste water inventory system**

A wastewater recycling drainage system needs to be established in Fort Portal municipality if sustainable water use is to be achieved. Impervious storage facilities into which high concentration, low volume and intermittent wastewaters from markets, residential places, garages, etc may be monitored, or treated to achieve control. Very seldom, it is possible to eliminate, contain or destroy wastewaters to a degree, which will permit release to public water sources without treatment of some sort, to meet quality standards such as PH of 6-7 and biochemical oxygen demand (BOD).

### **5.2.6 Safe water supply**

Much as national water and Sewerage Corporation in Fort portal branch is trying its best to adequately reach piped water to every place in the municipality and even beyond, there is need for development of water master plan by the municipal council that will address the wider aspects of water resources development beyond just water supply by NWSC. Such a plan should put emphasis on the following issues;

- Water shed management – There is need to establish water source protection so as to reduce the effects of poor land management practices on the water quality, which may include cultivation of river banks in the slopes of mount Rwenzori.
- Waste disposal and pollution – this comes as a result of disposal of untreated wastes and human excreta like urine into the natural drainage and water sources. This is especially common along river Mpanga that drains through Fort portal town.

Thus, to clearly address the above water issues, Fort portal municipal council together with NWSC need to increase collection, analysis, packaging and dissemination of water information. Also, byelaws should be established to protect the available water sources and their enforcement be ensured.

Further still, activities such as washing bays need to be subjected to environmental impact assessment before their establishment so that they follow proper standards established in the national environment statute for Uganda (1995).

This will finally help to reduce the water treatment costs met by NWSC, hence easy access to clean and safe water by the municipal communities.

### **5.2.7 Community education and awareness creation**

There is need for awareness and sensitization creation among key stake holders in order to bring about changes in community hygiene and sanitation practices in Fort Portal municipality. Such awareness should target among others, policy makers at national and district levels, municipal authorities as well as communities that are directly responsible for any unsanitary habits.

Awareness and education programmes should be carried out to sensitize people on values of proper waste disposal, ways of wastewater management, solid waste separation, personal hygiene guidelines as well as dangers associated with poor sanitation.

Awareness should further emphasize approaches that seek to equip the municipal communities with skills and knowledge for use of wastes for income generating activities, such as use of abundant organic wastes as cattle and fish feeds, and for organic manures production. Sensitization can be through radios like VOT, Life FM, etc, and workshops, seminars organized by municipal authorities and Kabarole District Local Government..

### **5.2.8 Further research**

This research however is not the climax of the investigations into issues pertaining public health, hygiene and sanitation standards in Fort Portal municipality. Therefore, the researcher recommends further research into areas that were left uncovered mainly on the possible ways towards achieving the above stated recommendations.

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## APPENDICES

### APPENDIX 1. Questionnaire.

INSTITUTION: KAMPALA INTERNATIONAL UNIVERSITY- UGANDA.

COURSE: BACHELOR OF SCIENCE. IN ENVIRONMENTAL MANAGEMENT.

TOPIC: *EFFECTS OF POOR SANITATION ON PUBLIC HEALTH AND  
THE ENVIRONMENT.*

Date of interview -----

Municipality/town-----

Division -----

Zone /LC1-----

Respondent no 

--	--	--

#### SECTION 1

##### Demographic characteristics of the respondents

###### 1)Sex of the respondent

1=male

2=female

###### 2)Age of the respondent in years

1=11-20 years

2=21-30 years

3= 31-40 years

4= 41-50 years

5= 51-60 years

6= 61 above

###### 3) Level of education

1= Primary

2= Secondary

3= Tertially

4= None

**4) Occupation of the head of house hold**

1= Peasant

2= Business person

3= Religious leader

4= Community leader

5 = Salaried worker

6= Husband /wife

7= Hawker

8= Others/specify-----

**5) For how long have you lived in this place?**

1 =<1 year            (<=less than)

2 =1-5 years            (>=more than)

3= 6-10 years

4= > 10 years

**6) Where did you come from?**

1=Urban

2= Rural

3= Citizen of the area

**7) What is your religious Affiliation?**

1= Catholic

2= Anglican (C.O.U)

3 = Islam

4= SDA

5= Pentecostal

6 = Born again

7= Others /specify-----

**8) What is your marital status?**

1= Single

2 = Married

3 = Divorced

4 = Widow

5 = Widower

**9) What is your tribe?**

- 1 = Mutooro
- 2 = Mukiga
- 3 = Munyankole
- 4 = Mukonjo
- 5 = Mwamba
- 6 = Others/ specify-----

**10) How many people live with you in the house?**

- 1 = Below 5
- 2 = 5 persons
- 3 = over 5

**11) What is the nature of your land tenure?**

- 1 = Land lord/ Lady
- 2 = Tenant
- 3 = Owner

**SECTION 2.**

**ENVIRONMENTAL CONTAMINANTS.**

**12) What type(s) of refuse do you normally generate?-----**

**13) How do you store refuse at your house hold /place of work**

- 1 = Dust bin
- 2 = Refuse sacs
- 3 = Polythene bags
- 4 = Nothing /open dump)
- 5 = Others /specify

**14) Do you separate your refuse before storage?**

- 1 = Yes
- 2 = No

**15) Do you have any central collection facility for garbage? Yes or No (Tick correctly).**

If yes, what is it? -----

If No, where do you deposit your waste? -----

**16) What is the distance from your house hold/place of work to the nearest facility?**

1 = 10-50 m

2 = 51-100

3 = > 100 m

**17) Who maintains the central collection facility and the area around it?**

1 = User committee

2 = Private company

3 = Local authority

4 = NGOs

5 = Others specify -----

**18) Do you have access to good latrine/ toilet facility? YES or NO.( tick correctly)**

**19) If YES, is it shared by the Public or it is for Individual use? Specify-----**

**20) Name which type of latrine you have access to-----**

**21) If NO, where do you dispose off your Excreta? -----**

**22) Do you have access to adequate water? -----**

**23) From which source do you get your water? -----**

**24) What is the distance from your house hold/ place of work to the nearest water source? -**

**25) Do you discover any change in the water quality every time you fetch it? (Like colour, smell, visibility etc)-----**

**26) What kind of activities in this town you think contaminate your water sources and even cause other environmental pollution effects?-----**

**27) How do you manage your waste water? -----**

**SECTION 3.**

**EFFECTS CAUSED BY ENVIRONMENTAL CONTAMINANTS TO THE PEOPLE AND THE ENVIRONMENT.**

**28) What is your view about the sanitation in this place? -----**  
-----

**29) Are there any cases of disease out breaks like cholera ,malaria, typhoid, dysentery, intestinal worms, trachoma in this Division? Yes or No (Tick correctly),**

**If yes, which ones? -----**

**30) Do you think the diseases have in one way or the other affected the community in this area?**

**YES or NO (tick correctly). If YES, explain how? -----**  
-----

**If No, why do you say so? -----**

**31) Do you know any dangers of indiscriminate management of solid wastes, liquid wastes, and uncontrolled human excreta disposal? YES or NO. (Tick appropriately).**

**32) If YES, which ones (tick appropriately)**

-Diseases

-Breeding grounds for disease vectors.

-Bad odours

- Others specify-----

**33) What disease vectors are associated with refuse in this area?(tick appropriately)**

-Flies

-Rats/ Mice

-Mosquitoes

- Stray dogs.

**34) Do you know any diseases that may be as a result of poor refuse management, unprotected human excreta disposal, unprotected water sources? YES or NO (Tick appropriately).**

**If NO, jump to question 40.**

**35) If YES, which ones (tick accordingly).**

- Diarrhoea            -Malaria            -Intestinal worms
- Cholera            -Trachoma           -Schistosomiasis
- Dysentery           -Typhoid            -others specify-----

**36) Has any member(s) of your family suffered from any of the diseases mentioned above within the last three months? YES or NO (Tick appropriately)**

**37) If YES, name the disease(s) (tick appropriately)**

- Diarrhoea      Dysentery
- Malaria        Intestinal worms
- Typhoid        Others specify-----
- Cholera

**38) What age was that person? -----**

**39) What sex was that person? -----**

**40) Do you some times smell foul air arising from the surroundings? YES or NO (Tick appropriately).**

**41) If YES, what do you think is the cause? -----**  
-----

**SECTION 4.**

**CHALLENGES FACED IN THE FIELD OF WASTE MANAGEMENT, WATER SUPPLY AND SANITATION IN FORT-PORTAL TOWN.**

**42) Do the community health workers and local leaders come and inspect this place /market frequently?-----**  
-----

**43) Are the people in the community involved in the community service clean up once in a while? -----**  
-----

**44) Are you impressed about the state of handling of wastes in this locality? -----**  
-----

**45) Do you have adequate Public Latrines/ Toilets especially in busy places like markets, car parks and bus park? Yes or No (tick correctly)**

46) If NO, explain why and what do people use?-----  
-----  
-----

47) What problems do you encounter when managing your refuse, liquid waste or waste water?-----  
-----  
-----

48) In your own opinion, do you think the municipal council is well empowered with the necessities to implement better sanitation programs in this town?-----  
-----  
-----

**SECTION 5. POSSIBLE SOLUTIONS.**

49) How can the problems of poor refuse management, uncontrolled human excreta disposal, and contamination of water supply sources especially River Mpanga be solved ----  
-----  
-----  
-----  
-----  
-----  
-----

50) What do you think should be done to prevent and control severe cases of diseases in Fort-Portal town?-----  
-----  
-----

**Thank you for your co-operation**

**APPENDIX 2. INTERVIEW GUIDE (Local authorities, NGOs, CBOs in Fort Portal)**

1) Name of the organisation/office-----

2) Title of the respondent -----

3) What are your operational areas (villages ,sub divisions or divisions and others) -----

4) What would you say is your role in the efforts to have clean environment, safe water and clean sanitation in your locality?-----

5) Are there any objectives of this organisation/office issues concerning public hygiene (sanitation) and Public water supply? (Yes or No)-----If yes, specify-----

6. What percentage of your annual budget is devoted to solid waste management or otherwise provision of sanitation facilities to urban communities-----

7) Have the organisation staff/committee members had any training related to proper solid waste handling and keeping clean water for consumption? (Yes or No)?-If yes, complete the table below.

Area of training	No. of staff trained	Category of staff trained

8. Does your organisation /office offer any training to the communities about how they can keep good sanitation standards (solid waste management personal hygiene, boiling water for drinking and others) .Yes or No? (Tick correctly). If yes, which ones in Particular (Fill in the table below).

Area of training	Target trainee groups

**9. What achievements have been realised in your organisation or office in relation to solid waste management and sanitation issues? -----**  
-----

**10. What has been some of your major problems in implementing the activities to ensure cleanliness of your area? -----**  
-----  
-----

**11. What do you think are the gaps in the service delivery as regards keeping good sanitation standards in your locality reach?-----**  
-----  
-----  
-----

**12 What suggestions do you wish to give as regards any aspects of solid waste management, clean water supply and Public hygiene in Fort-Portal Municipality?-----**  
-----  
-----  
-----  
-----  
-----  
-----

**Thank you for your co-operation.**

**APPENDIX 3. Observation check list. (For the researcher only).**

Zone-----

Date -----

**1. Kind of storage facility of wastes**

- Dust bin
- Refuse sacs
- Nothing
- Others specify-----

**2. Is it (i) covered (yes or no?)**

- Not covered
- Leak proof

**3. Cleanliness of the place (location)**

- Clean
- Dirty
- Smelly
- Others/specify-----

**4. Environment conditions (s) of the place**

- Clean
- Dirty
- Water logged
- Smelly, some garbage in neighbour hood
- Others specify-----

**5. Safety of the refuse handlers**

- Has gloves
- Long sleeved protection coat
- Gum boots
- Face protection wear
- None

**6. Safety of the water source in the area**

- Safe from ground contaminants
- Away from the pollutant source

- Easily contaminated
- High risk of pollution

**7. Activities taking place in the place-----**

---

-----

-

-----

-

-----

-

-----

-

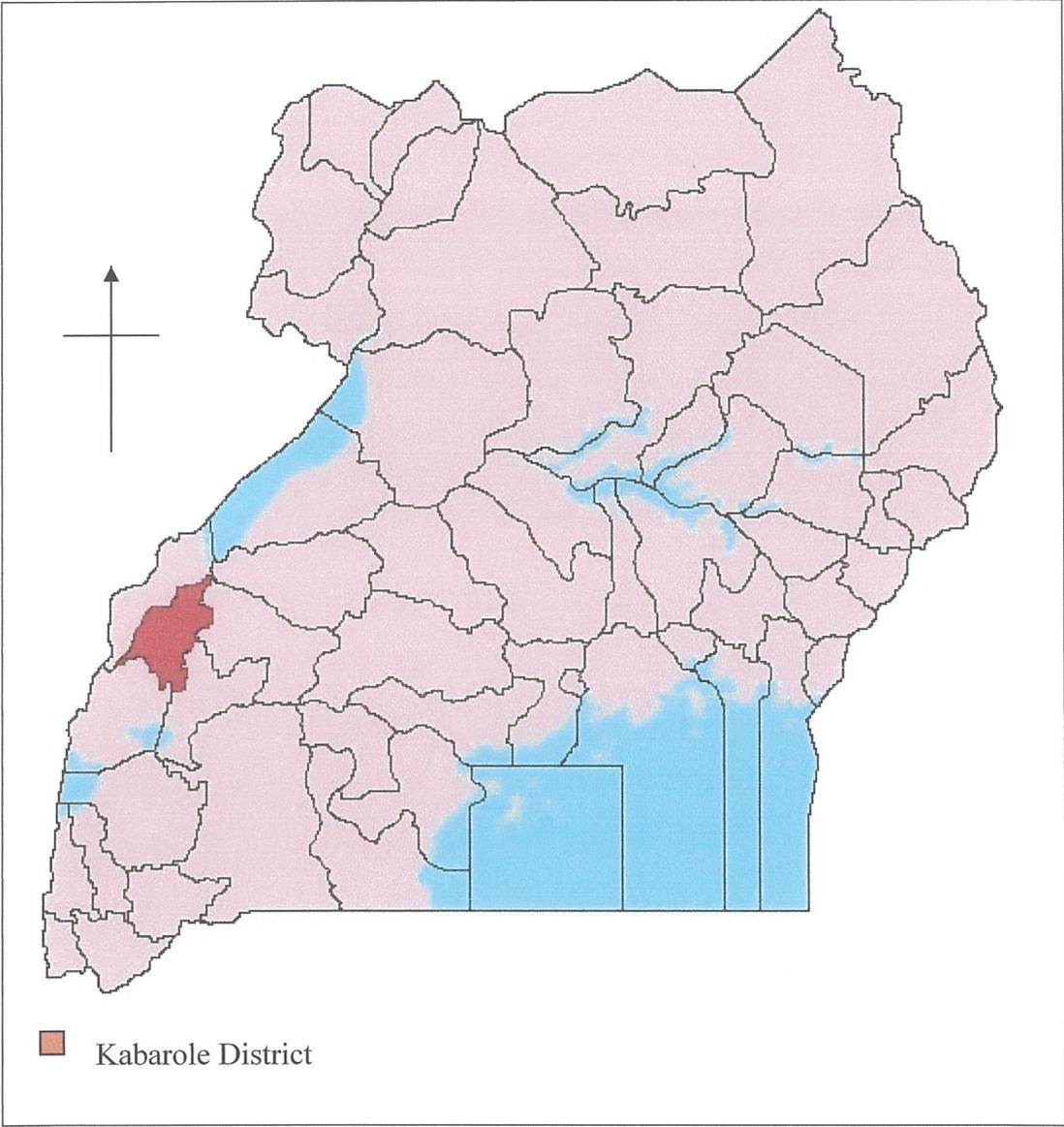
**8 .Type of sanitary facilities used by the people**

- Public latrines /pit latrines
- Flash toilets
- Open ground
- Others (specify)-----  
-----  
-----

**9) Safety and Location of Public Latrines in the Area-----**

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**APPENDIX 4. A Map of Uganda showing the location of Kabarole District.**





**APPENDIX 6. Research introduction letter/ permission letter.**



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E-mail: admin@kiu.ac.ug \* Website: http://www.kiu.ac.ug

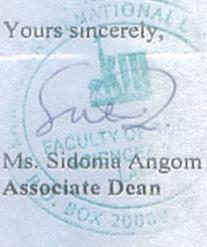
**FACULTY OF SOCIAL SCIENCES**

To... THE TOWN CLERK,  
FORT-PORTAL MUNICIPALITY,  
KABAROLE DISTRICT.

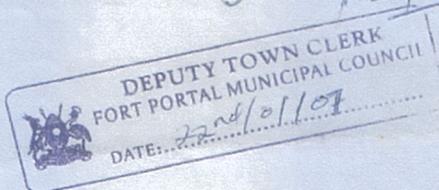
This is to introduce to you Mr/Miss MUSINGUZI DANSON  
who is a bonafide student of Kampala International University. He/She is  
working on a research project for a dissertation, which is a partial requirement  
for the award of a degree. I here by request you, in the name of the University,  
to accord him/her all the necessary assistance he/she may require for this  
work.

I have the pleasure of thanking you in advance for your cooperation!

Yours sincerely,

  
Ms. Sidoma Angom  
Associate Dean

SATC  
WEST  
EAST  
SOUTH  
SHTI } please attend  
this for necessary  
Assessment  
A22/nL



"Exploring the Heights"