

**POPULATION GROWTH AND LAND DEGRADATION
IN KAMWEZI SUB-COUNTY, KABALE DISTRICT**

BY

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DECLARATION


I **Ngabirano Betty** declare that this work presented in this research report is my original work and has never been submitted for any award of academic qualification in any other university or institution of higher learning for any award.

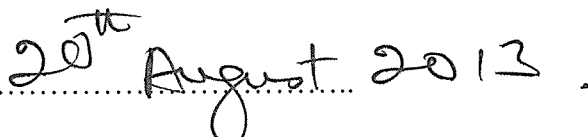
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Signature.......... Date.....20/8/2018.....

APPROVAL

This is to clarify that this research report by Ngabirano Betty Entitled "*Population Growth and Land Degradation in Kamwezi Sub County, Kabale District*" is a product of a study that has been undertaken under my supervision and it is now ready to be submitted to the department of development studies with my approval

Supervisor 
Dr. Otanga Rusoke (Phd)

Signature: Date:  .

DEDICATION

This dissertation is dedicated to my late Parents Mr. and Mrs. John Keihura whose invaluable parental care and education form a great foundation of this research.

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I first thank the Almighty God for the gift of life and all the provisions he has extended to me. I would also wish to thank my late parents Mr. and Mrs. Keihura Elia John for their moral and parental love.

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ABSTRACT

The research was conducted in Kamwezi sub-county of Kabale district. It was a study about population growth and land degradation: A case study of Kamwezi sub-county, Kabale district.

The general objective of the research was to find out the causes of population growth and its effect on land of Kamwezi sub-county. The specific objectives included; To find out the major causes of population growth in Kamwezi sub-county, to assess the effect of population growth on the land and to suggest possible solutions to the problems caused by population growth in Kamwezi sub-county.

Different methods of data collection were used; these include interview guide, questionnaire, observation and recording. Thirty six (36) respondents were sampled in the research, six from each parish of Kamwezi Sub County of whom three were females and three males respectively for each parish.

In this research causes of population growth in the area included; high fertility, low education, early marriages among others. The effects of population growth on land in Kamwezi sub-county included; soil erosion, land fragmentation, overgrazing, over cultivation, bush burning and other human activities like quarrying and house construction among others.

Possible solutions to the problems caused by population growth in Kamwezi sub-county were also suggested and include; controlled animal grazing, conservation of wetlands, re-afforestation and afforestation programmes among others.

The researcher recommended that there should be good methods of farming in order to reduce on land fragmentation. The research also recommends that there should be controlled grazing to reduce on overgrazing, formation of natural resource committees to regulate environmental issues in the county, practicing of family planning to control the high rate of birth, among other recommendations.

CHAPTER ONE

THE PERCEPTION OF THE PROBLEM

1.1 Introduction

The Uganda's population is increasing at a very high rate and this has resulted into the destruction of the land through poor methods of cultivation (over cultivation, monocropping and up and down cultivation on hill slopes), deforestation, wetland reclamation, bush burning, land fragmentation, quarrying and land pollution.

According to the 2002 Population and Housing Census, Uganda's population has experienced an average annual growth rate of 3.4% between 1991 and 2002, which is higher than the 2.5% observed between 1980 and 1991. The high rate of population growth is mainly due to the persistently high fertility levels that have been observed for the past four decades. The decline in other demographic indicators (crude death rate and infant mortality rate) as revealed by the Uganda Demographic Health Survey (UDHS) of 1995 and 2000 – 2001, has also contributed to the high population growth rate.

In Kamwezi sub-county like in other parts of Uganda, there is a problem of population growth and consequently land degradation. In Uganda, over 80% of the total populations live in rural areas and therefore Kamwezi people are predominantly rural. Kamwezi sub-county in 1994 experienced the problem of refugees from Rwanda and as a result many things such as land were negatively affected. There was congestion in schools and health centres together with conflicts between the refugees and the indigenous people of Kamwezi sub-county. Because of population increase in the area, there has been over use of the land to produce different food crops such as beans, sorghum, millet, sweet and Irish potatoes. Also the fragile eco-systems such as wetlands and hill slopes have been cultivated or cleared for human settlement. This in the long run has resulted into different problems like soil erosion, change in climate, loss of land value, poor yields, flooding, siltation of water channels, loss of vegetation cover, land conflicts and above all out migration.

It is important to note that the population of Kabale district where Kamwezi sub-county is located has been growing at the annual growth rate of 2.5% according to the 1991 census but it has declined to 0.9% in 2002. However, the population of Kabale district is still increasing for example in 1969, Kabale had a total population of

288,600, in 1980 it was 328,800, in 1991 it was 417,200, and in 2002 it was 461,785. Increased population means increased demand for food and therefore the need to expand the agricultural land. However, since most of the land in Kamwezi sub-county is already settled or under agriculture, wetlands, hill slopes and forested areas form the only alternatives. This situation has caused widespread wetland reclamation, forest clearing, bush burning, over grazing and over cultivation, which have exposed the soil to erosional agents.

It is from this background that the researcher looked for the factors responsible for population growth in Kamwezi sub-county, the effect of population growth on land and then solutions about how land degradation in the area can be controlled.

1.2 Theories of population growth

Thomas Robert Malthus (1798 – 1823) was a British economist and demographer, whose famous theory of population, highlighted the potential dangers of over population. In his famous *An Essay on the principles of population*, he stated that if human population was allowed to increase in an uncontrolled way, then the number of people would increase at a faster rate than the food supply hence any further increase would lead to population crash caused by natural phenomena like famine. This in turn would cause other dangers associated with high population growth like land degradation among others.

According to Karl Marx (1818 – 1883), population growth is related to the alleged ignorance or moral inferiority of the poor. He points out that landlordism, unfavorable high man-land ratio, uncertainty regarding land tenure system and the like are responsible for poor land use in any region. This is not exceptional with the study area of Kamwezi Sub County.

The theory of demographic transition relates the type of population growth to the level of social cultural, economical and technological development of the society. It explains the gradual limiting of biological determinants of fertility by a process of rational decision making. It explains the periods of stability and periods of different rates of exponential growth. Stable populations are the outcomes of high birth and death rates as well as low birth and death rates.

It also explains the dynamism of modernization related to change in population characteristics and how a demographically backward society transforms itself into dramatically advanced society. Some policies were put in place like family planning and an implicitly policy proposition of the theory is that population structure should change from wastefully high death and birth rates to more efficient and humane production with much lower death and birth rates.

1.3 Statement of the problem

The world faces a massive population increase. In Uganda, since 1948 population has been growing steadily without control measures in place. For example in 1948 Uganda's total population was five million, 1959 it was 6.5 million, 1969 it was 9.5 million, in 1980 it was 12.6 million, 1991 it was 16.7 million and in 2002 it was 24.6 million. Today's population growth rate in Uganda is 3.4%. Population growth is a crucial factor affecting various parts of the globe especially the Third world countries in terms of land degradation and underdevelopment. This prompted the researcher to identify this topic for study because there is a need for more information about the causes of population growth and its effects especially in the rural areas of Uganda.

In this particular aspect, Kamwezi sub-county was taken into consideration and acted as a representative of areas with the problem of land degradation due to population increase.

In Kamwezi sub-county, there is a problem of land degradation and many people are suffering because of lacking food as a result of poor yields. The researcher therefore, undertook the study to find out the major causes of population increase in Kamwezi sub-county, how land in the area is being degraded and with this one; the researcher looked at soil erosion, deforestation, bush burning, over cultivation, overgrazing, swamp reclamation and quarrying.

1.4 Definition of Terms

Land degradation

Land degradation in this study means the reduction in the value of land.

Population growth

This refers to the increase in the number of people living in a given area or region due to two major important factors that is natural increase in population and migration.

Crude death rate and crude fertility rates

This means the number of deaths per 1,000 population in a given year.

Infant mortality rate

This is the number of deaths of infants under age one per 1,000 live births in a given year.

Fertility

This means the actual reproduction of live children. It also refers to the number of live births women have.

Ecosystem

It refers to an integration of living and non-living organisms of an environment.

Land fragmentation

This refers to the owning of small pieces of land in different areas.

1.5 Research Objectives

The overall objective is to find out the causes population growth and land degradation in Kamwezi sub-county.

1.5.1 Specific objectives

The study was undertaken with the following objectives:

- (i) To find out the major causes of population growth in Kamwezi Sub-County.
- (ii) To assess the effect of population growth on the land of Kamwezi Sub-County.
- (iii) To suggest possible solutions to the problems caused by population growth on the land of Kamwezi Sub-County.

1.6 Research Questions

During the study, the researcher will use the following questions for the research:

- (i) What are the major causes of population growth in Kamwezi sub-county?
- (ii) What are the effects of population growth on the land of Kamwezi sub-county?
- (iii) What are the possible solutions to the problems caused by population growth on the land of Kamwezi sub-county?

1.7 Scope

Kabale district has a problem of population growth. The people are confined on the little and habitable land in the district. Kamwezi sub-county, the study area received around 2,384 refugees from Rwanda in 1994 and is one of the densely populated sub-counties in the district.

The research covered six parishes of Kamwezi sub-county and these are Rwenyangye, Kyogo, Kyabuhangwa, Kigara, Kibanda and Kashekye. The researcher selected respondents from these parishes.

The study dwells on analyzing the causes of population growth in Kamwezi sub-county and the impact of population growth on land.

Finally, the study suggests some recommendations.

1.8 Justification of the research

The topic "Population growth and land degradation in Kamwezi sub-county, Kabale district", is a case study in the area which is becoming congested given the fixed available land. Therefore, this will be an eye opener to the population of this area and other interested persons to start considering the ways to address the problem.

1.9 Significance of the study

The study is also hoped to generate findings that will be of assistance in contributing to the improved understanding and management of the problem of population growth and land degradation by the government of Uganda and the international agencies.

The research is intended to provide a basis of identifying the local land uses and the physical environment that has resulted from the problem of population growth in

Kamwezi sub-county. To this effect, the researcher prescribed the feasible and practical strategies that can assist to alleviate the problem.

The research is intended to provide information concerning the causes of population growth in Kamwezi sub-county and it is from here that the issue of land degradation can be addressed.

This research is intended to contribute to the researcher's academics as it will be submitted to the University for an Award of a degree in development studies.

The research is significantly going to provide information which can be used by other researchers as a base for deeper study in related issues such as gender and environmental degradation.

1.10 Ethical Consideration

The researcher made sure that during the process of data collection; no pain was inflicted on the people especially the Rwandese refugees who are still in the area. In this case, the researcher did not ask very sensitive questions especially political ones for instance whether they (refuges) have liked staying in Uganda or would like to go back to their country again.

The researcher also did not indicate the name and tribe of the respondents. The information given by the respondents was kept confidential. In other words, the researcher did not probe much into the private life of the respondents.

1.11 The geographical background of the research area

Kamwezi sub-county is found in Rukiga county of Kabale district in South Western Uganda. It borders Bukinda and Maziba sub-counties in the West, the Republic of Rwanda in the East and South, and Ntungamo district in the North. It is also composed of six parishes, namely Kashekye, Kibanda, Kigara, Kyabuhangwa, Kyogo and Rwenyangye.

The landscape in the research area is dominantly a complex of hills and is also endowed with renewable and non-renewable natural resources like fertile soils,

climate and vegetation cover. However, population increase in Kamwezi sub-county has had a great impact on the natural environment of the area.

1.11.1 Population distribution

The land area of Kamwezi sub-county is 129 km² giving a population density of 175 people per square kilometre and 183 people per square kilometer as according to the 1991 and 2002 population and housing censuses respectively. Increasing family size and population growth rate of 2.5 percent over the limited land availability has resulted in fragmentation of arable land and clearing of vegetation cover. This has resulted into other problems like soil erosion, low yields and land conflicts.

1.11.2 The physical characteristics of the research area

Topography

The area is generally mountainous with flat topped hills and ridges, especially in the North West between 1600 and 2000 metres above sea level. It changes to hilly in the northern part of Kibanda and almost flat terrain in the southern part of Kibanda at altitudes of 1470 – 1670 metres above sea level. The topography abruptly rises again to steep hills in areas bordering the Republic of Rwanda.

Hydrology

Hydrologically, Kamwezi sub-county is an extension of the Lake Victoria catchment area. There are a few small streams. However, the area has a permanent stream that runs from Rwenyangye through Kigara to Kibanda which serves as the main source of water for the community

Climate

Kamwezi sub-county borders a much drier zone which is part of the dry African cattle corridor that stretches from Northern Tanzania and Rwanda through southern Uganda, central Uganda belt to North Eastern Uganda and continuing to North-Western Kenya and Ethiopia.

According to the Meteorological department, Kabale district, the rainfall of Kamwezi sub-county is tropical and erosive. Kamwezi sub-county receives the least amount of rain in the district and suffers from periodic droughts and intermittent famine situations (World Vision 1994). This rain is brought about by North East and the

South East monsoons. The total number of days of rain is 60 – 90 in the Eastern half and 90 – 120 in the Western half of the sub-county. Monthly evaporation (Epan) is relatively higher (125 – 150 mm) than the rest of Kabale district (<125mm) for over $\frac{3}{4}$ of the year though relatively lower than the highest (175 – 200 mm) in Northern Uganda.

The rainfall of Kamwezi is bimodal with the first rains (Katumba) starting in February increasing through March with maximum intensity in April. It declines in May and stops in June. This is followed by a dry season (Ekyanda) in July and August. The second rains (Kicuransi) starts in September and is especially heavy in October; declines in November and December. This is followed by a short dry season during January and February (Table 1).

The dry season of July to August accelerates wind erosion. During these dry months, the skies are clear with no clouds and yet with a lot of winds which enhance wind erosion on bare ground of especially shallow top loam soils. The Night temperatures of these dry months are very low. They do drop drastically due to heavy cold air descending from hills to the valleys thus leading to coldness at Night while it is very hot during the day.

In the rainy months of March to April and September to October, rainfall is very heavy and very destructive especially as it comes after the sunny dry periods of the year. Such rainfall has big droplet sizes, much energy with high velocity which coupled with steep gradient can cause serious problems of soil erosion. This rainfall is not desirable compared to drizzle rain that comes in February and June which does not cause harm to the soil and crops.

Temperatures in Kabale district in general are not very high. The daily average mean is 18°C. Otherwise it ranges between 14°C – 21°C. It is also noted that in some cases it can be at 9°C. At the peak of the dry season (July and August), it goes up to 24°C and is common in Kamwezi sub-county.

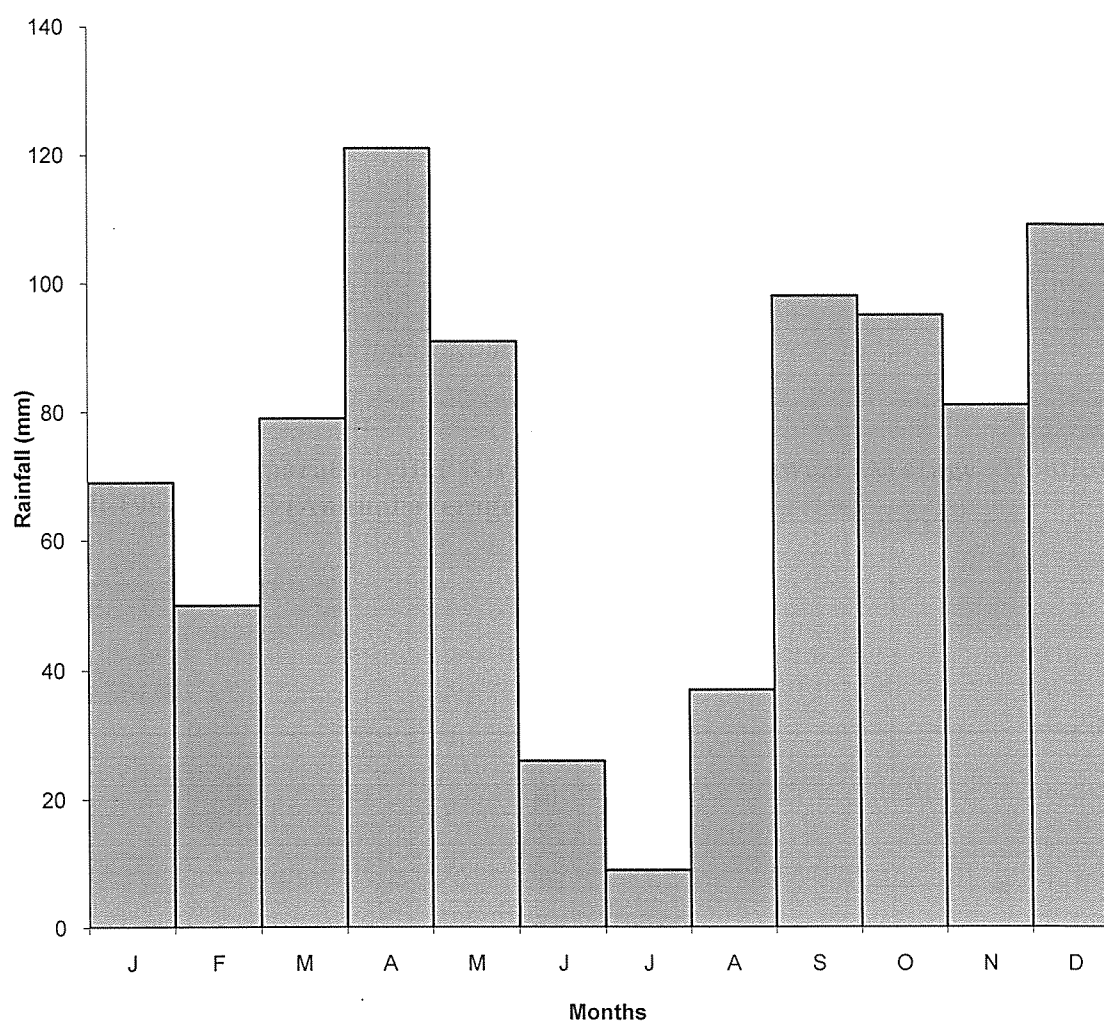
Based on available data up to 1966 recorded in the Atlas of Uganda (Uganda government, 1967) and on records kept at district headquarters, Kamwezi sub-county is a low rainfall area with recorded mean annual total of around 860 mm. This is shown in the table below:

Table 1: Showing the Average Monthly Rainfall for Kamwezi 1994 – 2002 and Kabale town.

Month	J	F	M	A	M	J	J	A	S	O	N	D	Total
Kamwezi	69	50	79	121	91	26	9	37	98	95	81	109	865
Kabale	61	92	108	136	96	26	20	58	98	106	95	92	988

Source: *Agriculture Officer Kamwezi Sub-County*

Figure 1: A Comparative Bar Graph showing Kamwezi Average Monthly Rainfall 1994 – 2002 (Annual average 1871 mm).



Source: *Agriculture Officer, Kamwezi Sub-county.*

Soils

The soils of Kamwezi sub-county are predominantly ferrallitic mainly sandy clay loams (Uganda Atlas 1967) with some skeletal sandy loams on the steep slopes. According to Harrop (1960), there are three dominant soil types in Kamwezi which

are very closely associated with topography. Their type and rating is summarized in table 2.

Table 2: Showing Kamwezi sub-county soil types

Area	Mapping unit	Soil type	Productivity rating	Erodibility
Kibanda and Kashekye	Ibanda	Clay loam to sandy clay	Medium to high	Moderate
North Kibanda and Rwenyangye	Bugangari	Loam to sandy loam	Medium to low	Very high
Kyabuhangwa and Kyogo	Kabale	Clay loam to loam	Medium to high	Moderate to high

Source: Lands and survey department, Uganda, surveyed by J.F. Hamrib (1960).

Vegetation

The original vegetation that is hardly seen at present due to intensive cultivation and effects of intermittent bush fires was predominantly of the Dry Acacia Savannas (Uganda government, 1967). The remnants of this are seen in patches on the grazing lands.

Kamwezi sub-county is divided into two agro-ecological zones that is Pygeum – Moist Montane forest in Rwenyangye, Kyogo, Kigara, Kashekye, Kyabuhangwa and grass Savanna in Kibanda. The broad land use patterns are directly related to agro-ecological zones with the cultivation farming intensively practised in the mountaineous and hilly areas while the pastoral wild grazing is done in the lower, almost flat areas of this agro-ecological zone.

The most dominant vegetation is Acacia gerrardii/ Red grass, Rhodes grass Themeda triandra/ fire climax grass savanna in the lower lands of Kibanda, Kigara, Kashekye and Western parts of Kyabuhangwa and these lands are under open grazing.

In Kamwezi sub-county there is also planted vegetation and the most common is the Eucalyptus trees which are used for fire wood, building materials and timber. Of

recent, there has been over exploitation of this specie of vegetation and therefore deforestation with its associated effects like fuel wood scarcity and soil erosion.

The high lands of Rwenyangye, Kigara Kyogo and Kyabuhangwa were covered by *Peridium aguilivum*/*Melinis* specie, Fire climax grass savanna and *Exothea-abyssinia*/*Hyparrhenia* specie – fire climax grass savanna but were destroyed by man through intensive farming.

River banks in Kamwezi sub-county are covered by *Albizia* specie, *Cymbopogon Afronardus* fire climax – tree savanna and montane thicket – fire climax. The hills bordering Ntungamo district are covered mostly by *Themeda triandra* and *Londentia Kagerensis* fire climax grass savanna.

The study here may suggest that some parts of the land can produce more food than others parts depending on the soil type, vegetation and the climate. The death rates and fertility rates may be dependant on food supplies, climatic changes that increase as decrease certain diseases in conditions that favour increased use of land or less use of land. Climatic changes may increase soil erosion but this may be regarded as being independent of population increase.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents a review of existing literature as regards the causes and effects of population growth on the land.

2.1 Causes of Population Growth

According to a number of studies about population growth, several issues have been analysed. Pearce (1993) argued that world population growth is the result of marked and rapid reductions in mortality rates due to improved health care, education and sanitation, especially in developing world. For example, one-quarter of Srilanka's decline in mortality since 1945 has been attributed to malaria control (World Bank 1984, P.69). Although birth rates have fallen, they remain significantly higher than death rates in the developing world; in the industrial world, they are only slightly higher than death rates. This in the long run has resulted into population growth.

Webster, A. (1990) pointed out that population growth is a matter of great concern today, particularly in the Third World. Yet a growing population is also considered to be an important encouraging economic growth. Clearly this implies that there is an optimum set of conditions which must balance population growth with sustained economic development. Webster goes a head and argues that the growth of a population results from the excess of births over deaths as well as the movement of people between regions or countries. The natural increase in a population, that is the surplus of births over deaths, occurs for two reasons: first, an improvement in the control of disease through wide spread improvements in health care, especially public sanitation and secondly, an improvement in the standard of nutrition through out the population.

Lappe F.M and Schurman R. (1989) have supported Pearce's argument. They pointed out that the widely accepted explanation of what tripped the population wire in the Third World is that a rapid drop in death rates occurred without a parallel drop in birth rates. With more people living longer, but as many babies still being born populations began to grow fast. While a similar shift was typical of the first stage of a transition to slow population growth in the now industrial countries, what has happened in the

Third world is different. The mortality decline there has been sharper than that which occurred in Western Europe and the United States, and it happened against a back drop of higher initial birth rates. Some demographers however say that this was because of introduction of vaccines, antibiotics, improvement in education, sanitation and nutrition.

Barton *et al* (1997) also argued that Natural population growth which means the difference between the number of births and deaths occurring in a given period of time have caused population growth in some areas. For the sake of comparison, this is usually expressed as a percentage increase with respect to the population existing at the beginning of the time period considered. This indicator is known as the Rate of Natural Increase (RNI).

Barton *et al* (1997) also pointed out that migration has led to population growth in some areas. Migration is often a significant factor, not only in the demography of small communities, but also affecting the way in which human populations relate to their environment. Immigration and emigration are not, however, usually documented routinely at the local level. If births and deaths are known for the period, this 'out' migrants existing in a population at a given point in time (Livi Bacci, 1990). It should be noted that a positive result to the equation indicates immigration flow towards the considered area; a negative indicates emigration.

However, Webster, A.. (1990) argued that migration into and out of areas is a major social factor influencing population levels in a country, and can be a particularly acute problem for countries in receipt of many hundreds of thousands of refugees at times of warfare, or immigrants seeking to enhance their life chances by leaving their impoverished homeland. Since both warfare and poverty are grim but routine features of the Third World today, it is not surprising to find a substantial volume of migration with in it.

It is the current perspective in both the scientific and lay communities that food production must be increased in order to support a growing human population (Bongaarts, 1994). For example, Young (1999) noted that current UN population projections predict that the population of developing countries will rise to about eight billion by 2025 and nine billion by 2050. He then asserted, "It is widely recognised

that massive agricultural development will be needed to feed this added population. Fertility according to Bongaarts, (1994) was the leading cause of population growth, therefore he further indicated that increased demand of food is due to the growth in population of the world thus improved science and technology has made food available.

Fertility according to Uganda Demographic and Healthy Survey 2000-2001 is one of the causes of population growth. In Uganda for example, fertility varies enormously across sub-groups of women. Fertility levels are much higher in rural areas (7.4 children per woman). The Total Fertility rate is lowest in the central region (5.7 children per women) and highest in the Northern region (7.9 children per woman). Also women who have attended secondary education have a much lower fertility (3.9 children per woman) than women with no education (7.8 children per woman), a difference of four children.

Early marriage has caused population growth in many areas of Africa. For instance although the minimum legal age for a woman to get married in Uganda is 18 years, the 2000-2001 Demographic and Health survey results show that marriage is common among young girls. Among women aged 20-49, it was found out that 17 percent were married by age 15 and more than half were married by age 18. The median age at first marriage among women is just before 18 years and has been fairly stable for the past 30 years. Men generally marry four years later than women.

It should however be noted that early marriage has led to population growth in a sense that it has resulted into early child bearing. For example according to the Uganda Demographic and Health Survey 2000-2001, it was noted that child bearing in Uganda begins early. Three in ten women aged 15-19 are already mothers or pregnant with their first child. Teenage child bearing is closely related to a woman's education. Six in ten teenagers with no education have become mothers or are pregnant with their first child compared to 33 percent of women with some primary education; and only 17 percent of those who attended secondary education.

Large differentials in the use of contraception are another factor affecting fertility and consequently population growth. According to a study which was conducted under the Uganda Demographic and health survey 2000-2001, there are large differences in the

use of modern contraceptive methods across sub-groups of married women. Use of modern family planning methods is much higher in urban areas than in rural areas (42 and 15 percent, respectively). Contraceptive use is highest in the central region (31 percent) and lowest in the Eastern region (11 percent).

Women with at least some secondary education are four times more likely than women with no education to use modern methods (42 percent and 9 percent respectively). Contraceptive use in Uganda is positively associated with the number of living children and women's socio-economic status.

Pearce D.w. (1993) argued that age at marriage for girls in Africa has not declined significantly, breast-feeding and postnatal sexual abstinence seem to have declined, and the rate of using contraceptives remains extremely low. This has therefore resulted into population growth.

According to the Uganda Demographic and Health Survey 2000-2001, marriage is the leading social and demographic indicator of exposure of women to the risk of pregnancy, especially in the case of low levels of contraceptive use. Early marriages in the Ugandan context where use of family planning is limited lead to early child bearing and a longer period of exposure of women to reproductive risks, which leads to high cumulative fertility levels. Marriage among young girls is a common practice. Among women aged 20-49, 17 percent were married by age 15 and more than half were married by age 18. However, marriage among men starts fairly late. By age 20 only 26 percent of men have been married, while for women 25-49, it is 18, suggesting that men marry about four years later than women.

According to the World Bank (1986), the birth rate continues to be high because of the following influences which under lie the reasons already given.

First, the continuing agriculture bias in African economies provides incentives to invest in children, who serve as labour on the farm, assist with collecting fuel wood and water, care for other children, tend to livestock, and perform other chores. Moreover, the amount of land that can be cultivated often depends on family size, creating further incentives for large families. The private benefits of increasing

family size thus tend to outweigh the private costs, and this determines the size of the family.

Second, large families provide social security through the extended family. Being a child frequently involves many obligations to other members of the family. Once again, investing in children becomes a way of ensuring care in old age. Moreover generally, large families mean wealth and influence.

Third, as long as women have an inferior social role to men any preference they might have for smaller families will be underrepresented in the private cost-benefit decisions made about family size. Often however, a woman's own status depends on child bearing so that many women appear to share the preference for large families. As education expands and other forms of emancipation increase, some women can be expected to change their preferences for large families while others, with a prevailing but over ruled preference for smaller families, can be expected to exert more influence.

Fourth, having few children and investing in their education is a high risk strategy when infant mortality is high and the prospects for employment are poor. Once again, this risk a version influences the private cost-benefit decision to favour large families. As employment prospects improve and infant mortality declines, the benefit-cost ratio can be expected to begin favouring smaller families.

Therefore, according to the World Bank (1986), the social, economic and cultural factors underlying decisions about family size are complex. They are also likely to vary from society to society.

According to the Uganda Demographic and Health Survey 2000-2001, it was noted that among women who are not using contraceptives, the exposure to the risk of pregnancy in the period following birth is determined by two major factors, namely, breast-feeding and sexual abstinence. Postpartum protection from conception can be prolonged by breast-feeding, which can lengthen the duration of amenorrhoea (the period between birth and the return of menstruation), or by delayed resumption of sexual activities (postpartum abstinence). However, if this is not done, conception may take place and hence high fertility.

The role of government should not be left out as a cause of population growth. Pearce D.W (1993) argued that, it is also worth remembering that governments may not pursue policies to control population with great vigour. Some African leaders, for example, support population growth as a means of securing economies of scale. They may perceive that output per hectare does not diminish as new land is brought under cultivation; according to this view, more people mean bigger markets and hence a greater division of labour and a larger base for financing overhead costs.

Religious factor has also influenced population growth in many parts of the world. According to Cox P.R (1976), people's religious importance relates to the methods by which limitation of the number of children is achieved. He also noted that infanticide, an ancient method of population control, is now universally condemned. Induced abortion is considered very undesirable, at least on health grounds although it is extensively practiced in many countries today. Official Roman Catholic Church doctrine is still opposed to contraceptives – although not to methods of limitation that are dependent on abstinence from intercourse – and fertility tends to be materially higher in Catholic communities among adherents of other faiths in the same countries.

Demographic research has established that marriage patterns in a society form one of the main determinants of fertility (Bongaarts 1978). These patterns include age at first marriage, marital status and number of wives per man. In the absence of major contraception, the lower the age at which women start producing children and, therefore, the higher the fertility level. Further, the higher the percentage of married persons the more coital frequency in a population which results into higher levels of fertility. All these factors therefore have led to population growth.

2.2 General Effects of Population Growth

According to Barton et al (1997), the human population is growing most rapidly in the poorest regions of the world, where the resources for technological development are most scarce and the institutional structure is weakest. Already today, one person in five cannot get enough food to support an active working life. One quarter of the World's people still are without safe drinking water, and many more are without proper housing and sanitation. Millions of children still die from malnutrition and

preventable diseases, and half a million women die each year from pregnancy – related problems.

Pickering K.T et al (1994) pointed out that the human impact on vegetation began with the agricultural activity which brought changes in the shape of the landscape. The first human impact which is still prevalent is the use and misuse of fire. Even though over half of the fires that occur are natural resulting from lightening strikes or spontaneous combustion of decaying organic material, the rest can be attributed to accidental or deliberate burning by humans.

Deliberate burning is used to clear land, though it can be used to help improve the quality of the soil in arid regions through adding fresh organic material, or as an aid to reduce wide spread fires. Fires cause a reduction in the natural vegetation; they threaten wildlife, humans and property. It should also be noted that fire produces secondary problems associated with the clearance of vegetation, such as soil erosion, flooding and wind erosion.

The notion that as the population approaches the asymptote of food limits, mass starvation will ensue has been implied, if not state explicitly. Throughout the literature on the subject, the position has been “we must increase food production to feed a growing population” (Bongaarts, 1994). However due to biological realities, the population cannot be sustained beyond the level of food availability. Because of the Malthusian perspective which is pervasive in our culture, that food production must be increased to feed a growing population’, that, in fact, is what occurs. The result is annual food production increases that cause annual population increases, with seriously increasing malnutrition and added diseases.

Also according to Pickering K.T et al (1994), the domestication of animals has a major impact on the land surface. Heavy grazing of cattle leads to trampling and compaction of the soil, reducing its capacity to hold water and altering its structure. Ultimately this leads to soil erosion, both by wind and water.

Pickering K.T (1994), further noted that open cast and subterranean mining activities provide human kind with the wealth that has sustained the growth of civilization and the quality of life that we enjoy. However, there are many problems associated with mineral extraction which include chemical pollution and disfigurement of the

landscape, as well as disturbances to the natural rates of Earth surface processes. Mineral extraction results in the construction of tips, increased sediment loads in rivers, soil erosion and the pollution of water sources and adjacent land, which often lead to vegetation and soil degradation.

Therefore, human activities are continually modifying the landscape, creating pits, ponds, spoil heaps, terraces, cuttings, embankments, dykes, canals, reservoirs, and areas of subsidence. This is due to the need to cater for the high population in given areas.

According to Jhingan (1997), the consequences of population growth on economic development have attracted the attention of economists ever since Adam Smith wrote his *Wealth of Nations*. Adam Smith wrote,

“The annual labour of every nation is the fund which originally supply it with all the necessaries and conveniences of life”

It was only Malthus and Ricardo who created an alarm about the effects of population growth on the economy. But their fears have proved unfounded because the growth of population in Western Europe has led to its rapid industrialization. Population growth has helped the growth of such economies because they are wealthy, have abundant capital and scarcity of labour. In such countries, the supply curve of labour is elastic to the industrial sector so that even a high growth rate of population has led to a rapid increase in productivity. In fact, every increase in population has led to a more than proportionate increase in the gross national product.

However, according to Jhingan (1997), the consequences of population growth on the development of less Developed Countries are not the same because the conditions prevailing in these countries are quite different from those of the developed economies. These economies are poor, capital scarce and labour – abundant. Population growth adversely affects their economic development in the following ways:

Faster population growth makes the choice more scarce between higher consumption now and the investment needed to bring higher consumption in the future. Economic development depends upon investment. In less developed countries the resources

available for investment are limited. Therefore, rapid population growth retards investment needed for higher future consumption.

Also rapid population growth tends to over use the country's natural resources. This is particularly the case where the majority of the people are dependent on agriculture for their livelihood. With rapidly rising population agricultural holdings become smaller and unremunerative to cultivate. There is no possibility of increasing farm production through the use of new land (extensive cultivation). Consequently, many households continue to live in poverty. In fact rapid population growth leads to the over use of the land thereby jeopardizing the welfare of future generations.

Lastly, with rapidly growing population, it becomes difficult to manage the adjustments that accompany economic and social change. Urbanization in less developed countries creates such problems as housing, power, water, transport and sanitation. Besides, growing population threatens permanent environmental damage through urbanization in some rural areas.

Cox P.R (1976) pointed out the effect of population pressure upon the demand for resources. The demand for natural resources is in the last resort governed by the demand for final products, in the manufacture of which the resources are used; it is thus influenced by the rate of population increase and by the rate of growth of real income. Occasionally, as industrialization proceeds, there may be a decrease in demand for particular raw materials or products because of the introduction of substitutes, and so innovations can have an adverse effect on the trade of the poorer countries.

Population growth also affects per capita income in three ways according to Jhingan (1997). It increases the pressure of population on land, it leads to arise in costs of consumption goods because of the scarcity of the cooperant factors to increase their supplies and lastly, it leads to a decline in the accumulation of capital because with increase in family members, expenses increase. It should be noted that these adverse effects of population growth on per capita income operate more severely if the percentage of children in the total population is high, as is actually the case in all the less Developed Countries of the World.

Population growth also according to Jhingan (1997) affects the standard of living since one of the important determinants of the standard of living is the per capita income and the factors affecting per capita income in relation to population growth equally apply to the standard of living. It should be noted that a rapidly increasing population leads to an increased demand for food products, clothes, houses, medical and educational facilities but their supplies cannot be increased in the short run due to lack of cooperant factors like raw materials, skilled labour and capital. Consequently, their costs and prices rise, which raise the cost of living of the masses. This brings down further the already low standard of living. Poverty breeds large number of children which increases poverty further, and the vicious circle of poverty, more children and low standard of living.

Population growth also affects agricultural development. Jhingan (1997) argued that, in less developed countries people mostly live in rural areas and agriculture is the main occupation. So with population growth the land-man ratio is disturbed. Pressure of population on land increases because the supply of land is inelastic. It adds to disguised unemployment and reduces per capita productivity further. As the number of land less workers increases, their wages fall. Thus low per capita productivity reduces the propensity to save and invest. As a result, the use of improved techniques and other improvements on land are not possible hence shortage of food.

Also, Jhingan (1997) argued that a rapidly increasing population plunges the economy into mass unemployment and under employment. As population increases the proportion of workers to total population rises. But in the absence of complementary resources, it is not possible to expand jobs. The result is that with the increase in labour force, unemployment and under employment increase.

Jhingan (1997) further argued that a rapidly growing population necessitates large investments in social infrastructure and diverts resources from directly productive assets. Due to scarcity of resources, it is not possible to provide educational, health, medical, transport and housing facilities to the entire population. There is overcrowding every where. As a result the quality of these resources goes down.

Jhingan (1997) also argued that rapid population growth leads to environmental damage. Scarcity of land due to rapidly increasing population pushes large number of people to ecologically sensitive areas such as hillsides, wetlands and tropical forests. It leads to over grazing and cutting of forests for cultivation leading to severe environmental damage. More over, the pressures of rapid growth of population force people to obtain more food for themselves and their livestock. As a result they over cultivate the semi-arid areas. This leads to desertification over the long run when land stops yielding anything. Besides, rapid population growth leads to the migration of large numbers to urban areas with industrialization and this results in severe air, water and noise pollution in cities and towns.

Opinion

In Uganda, since 1948 population has been growing steadily without control measures in place, this has resulted into population explosion in the country mostly in areas of Bugisu highlands, Kigezi highlands and central Uganda among other areas. Population growth is a crucial factor affecting various parts of the globe especially the Third world countries Uganda inclusive. However as noted in the literature, there still exists need for further research in the causes and effects of high population growth in the different parts of the world that have not be identified. In this particular aspect, Kamwezi sub-county will serve as one study case to detail the causes and effects of population growth on land use in the area.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter contains the methods of data collection, sources of data, data analysis, study population and sampling strategies.

3.1 Study population

The population of the study were the residents of Kamwezi sub-county both male and female adults, Local council chairmen, sub-county chief, Headteachers of different schools and health officials of Kamwezi sub-county were also used.

3.2 Sampling Strategies

Kamwezi sub-county is relatively large with six parishes namely Rwenyangye, Kyogo, Kyabuhangwa, Kigara, Kibanda and Kashekye. Therefore because of the size of the sub-county (129 square kilometers).

Random sampling method was used to get the respondents and the information obtained for the whole sub-county. The criterion that was used by the researcher to get the respondents was getting the resident of the area and head of household. Also the researcher identified areas which were over populated and therefore facing the problem of land degradation as target areas.

The researcher identified herself to the local council (LC) chairmen of respective villages with the help of an introductory letter that was obtained from the Head of Department, Development studies, Kampala International University.

The chairmen of various villages availed the researcher with a list of households and names from which, using a table of random numbers, the names of the people who acted as the researcher's respondents were randomly selected.

The researcher used primary data from respondents selected within the parishes of Kamwezi Sub County, Kabale district. The researcher also used secondary data from journals, textbooks, and other reference materials.

It is important to note that when carrying out the study, the researcher used 36 respondents. 18 of the respondents were females and the other 18 males.

3.3 Data Collection Methods

Semi structured interview guide was used with the respondents who could not read and write. This helped the researcher to generate in-depth data by asking them questions in relation to the research questions.

3.3.1 The Questionnaire

The researcher used a structured questionnaire because it collected information or data from many respondents in a projected time span. All respondents were asked the same questions and from options, they were expected to pick the best alternatives. The use of close – ended questions was minimize, vague and unwarranted responses. With this method, the researcher collected data concerning factors or causes of population growth and its effects on land. This method helped in collecting data concerning the social and economic effects of population growth in Kamwezi sub-county.

3.3.2 Observation and recording

Observation method helped in identifying and classifying the changes in land use patterns in Kamwezi sub-county due to land degradation. Observation method greatly assisted where respondents were unable to give information on issues such as causes of deforestation and swamp reclamation. For recording, this involved writing down all observations made from the field and drawing of tables and maps.

3.4 Validity of Instruments

In order to test and improve on the validity of the questionnaire, the researcher availed the first draft to colleagues doing the same course, and later to some lecturers. These looked at the items and checked on the language, clarity, relevancy and comprehensiveness of content and length of the questionnaire. The researcher made a number of adjustments in respect to various comments that were made and with the advice of the supervisor. In order to establish reliability of the instrument, the researcher conducted a pilot study using 20 respondents from Kamwezi sub-county. After the pilot study some questions as well as the approach of questionnaire

administration were modified. After tapping the required information, the instruments were then used to collect data from the study area.

3.5 Data Processing and Analysis

This process began by editing the interview schedules and was done by the researcher herself. Editing was done to ensure completeness, uniformity, accuracy and consistency of all the questions asked.

This was followed by tabulation which involved the arrangement of data into tables. Data was analyzed descriptively using frequency counts and percentages where it was necessary and possible. Data was also analyzed using excel and presented in charts and bar graphs.

CHAPTER FOUR

4.0 PRESENTATION AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter presents the data analysis and the discussion of the findings collected from the field. It describes the causes of population growth and its effect on the land of Kamwezi sub-county. It further describes other effects of population growth in the sub-county apart from land degradation together with possible solutions to the problems identified.

4.2 The Major Causes of Population Growth in Kamwezi Sub-County

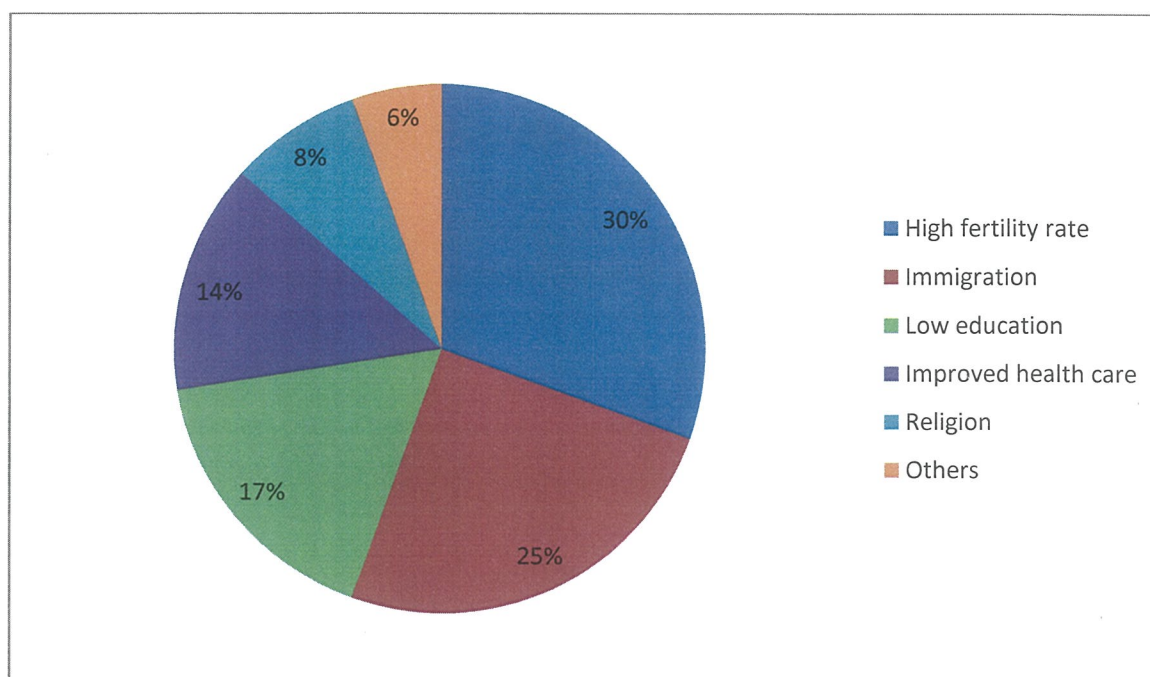
Table 3: Showing Causes of Population Growth in Kamwezi Sub-County

Causes of population growth	No. Of respondents	Percentage (%)
High fertility rate	11	30.5
Immigration	9	25
Low education	6	17
Improved health care	5	14
Religion	3	8
Others	2	5.5
Total	36	100

Source: *Primary Data from the Field*

As observed from the above table, high fertility rate was the leading cause of high population growth in Kamwezi Sub County with a percentage of 30.5%. This was followed by immigration with 25%, low education with 17% and improved health care at 14%. Religion was also another cause of high population growth in the area contributing 8% whereas other causes including early marriage, polygamy, strong family ties, improvement in agricultural practices, and political stability contributed 5.5% of the causes of population growth in Kamwezi sub county.

Figure 2: Showing the causes of population growth in Kamwezi Sub County



Source: Primary data from the field

4.3 The Effect of Population Growth on the Land of Kamwezi Sub-County

Population growth in Kamwezi sub-county has affected the land negatively. Due to increase in the number of the people in the area, it was found out that the major effects of population growth on land in Kamwezi Sub County, wetland reclamation, over cultivation, land fragmentation, over grazing, bush burning and quarrying.

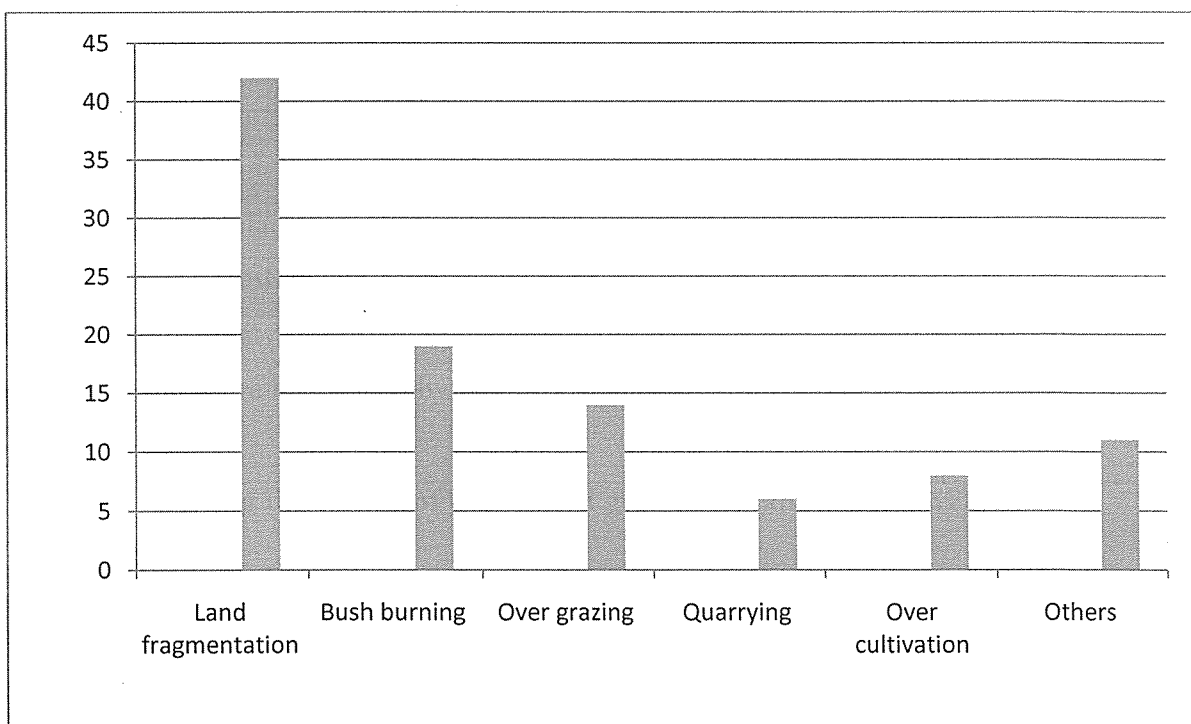
Table 4: Showing the effects of population growth on land of Kamwezi sub county

Effects of population growth on the land of Kamwezi sub county	No. Of respondents	Percentage (%)
Land fragmentation	15	42
Bush burning	7	19
Over grazing	5	14
Quarrying	2	6
Over cultivation	3	8
Others	4	11
Total	36	100

Source: Primary data from the field

Out of the 36 respondents sampled, 15(42%) mentioned that land fragmentation was the leading effect of population growth on land in Kamwezi sub county. This was followed by bushing burning with (7)19%, overgrazing at (5)14% while other factors such as swamp reclamation contributed to (4)11% of the effects of population growth on the land of Kamwezi sub county. Other effects of population growth on the land of Kamwezi sub county were over cultivation with (3) 8% and quarrying at (2)6% of all the effects that were mentioned by the respondents.

Figure 3: Showing the effects of population growth on land of Kamwezi Sub County



Source: Primary data from the field

4.4 Possible Solutions to the Problems Caused by Population Growth in Kamwezi Sub-County

In Kamwezi sub-county due to population growth, the people of the area are facing a number of problems mainly environmental. It was found out that the problems they face include soil erosion, land fragmentation, wetland reclamation, and deforestation among others.

From the research findings, respondents suggested many ways to overcome the above problems which included; controlled animal grazing, conservation of wetlands, re-

afforestation and afforestation programs, use of improved agriculture practices, land refilling after quarrying, introduction of family planning programs, education for all, loaning system among others.

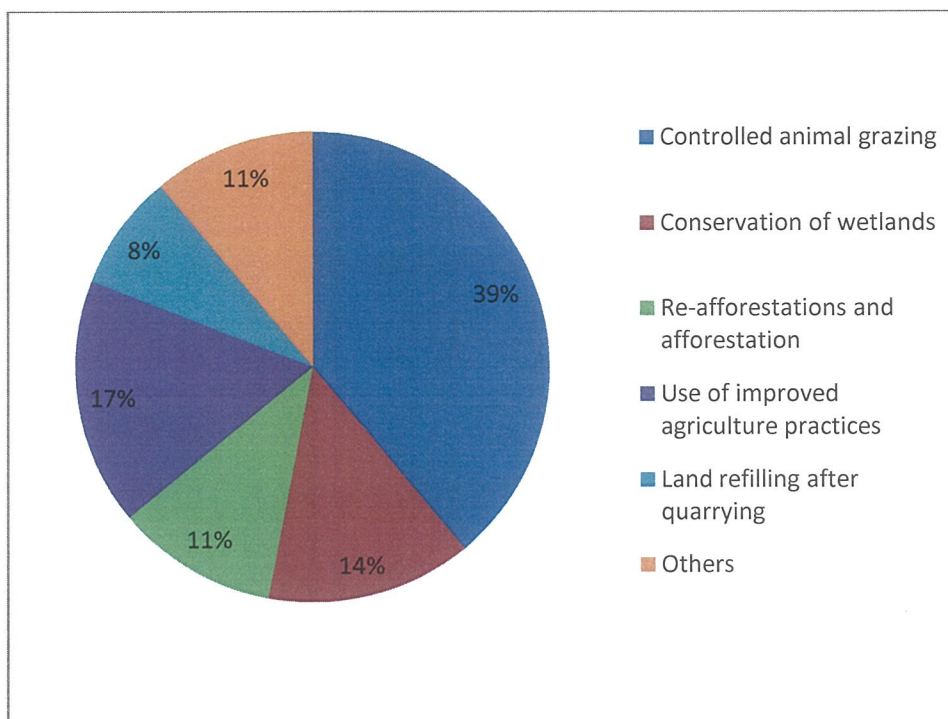
Table 5: Showing possible solutions to the problems caused by population growth on the land of Kamwezi sub county

Solutions	No. Of respondents	Percentage (%)
Controlled animal grazing	14	39
Conservation of Wetlands	5	14
Re-afforestation and afforestation Programs	4	11
Use of improved agriculture practices	6	17
Land refilling after quarrying,	3	8
Others	4	11
Total	36	100

Source: Primary data from the field

From the table above, out of the 36 respondents sampled, 14 (39%) suggested controlled animal grazing as the main solution to the problems caused by population growth on the land of Kamwezi sub county. Other solutions suggested were conservation of wetland 5 (14%), re-afforestation and afforestation 4(11%), use of improved agriculture practices 6(17%), land refilling after quarrying 3 (8%) and other suggestions attributing to 4 (11%) of the solutions to the problem.

Figure 4: Showing the possible solutions to the problems of caused by population growth on the land of Kamwezi sub county



Source: Primary data from the field

4.5 Discussion of the Results

4.5.1 Causes of population growth in Kamwezi Sub County

Immigration

According to research findings, the first batch of Rwandese refugees reached Kamwezi sub-county in the late 1950s and the second batch in early 1960s following the political instabilities and turmoil that befell Rwanda. The last batch of Rwandese refugees came in 1990 after the start of the protracted war in Rwanda by the Rwandese patriotic Front (R.P.F).

The United Nations High Commissioner for Refugees (UNHCR) took many of the refugees who came to Kamwezi sub-county to different refugee camps in Uganda like Kyaka I and II. However, some remained in Kamwezi; bought land, stayed with friends or relatives and therefore settled permanently.

It should be noted that according to the records at Kamwezi sub-county headquarters, the Rwandese refugees who registered there and settled in the area in 1990 were 2,384. This number therefore, increased the population of Kamwezi sub-county

because they were also counted during the 1991 population and housing census. In Kamwezi sub-county temporary refugee camps were established in the parishes of Kibanda, Kashekye and Kyabuhangwa. It is important however to note that some refugees did not go to those camps but instead stayed with their relatives or friends in different parts of the sub-county. As of now those refugee camps are no longer there.

Although the Rwandese refugee influx into Kamwezi sub-county caused population increase in the area, other factors including high fertility rate, relative political stability, improvement in health care and agriculture equally played a big role in increasing the population of Kamwezi sub-county as shown by the findings as per the sub-headings.

High Fertility

According to research findings, Kamwezi sub-county has high fertility which caused population growth in the area. On average, Kamwezi sub-county has a high fertility rate of 7.65(Kabale District population office). Therefore, according to the findings high fertility rate is a major cause of population growth in Kamwezi sub-county. According to the findings, different reasons/factors are responsible for this high fertility in Kamwezi sub-county. These include low education, culture; early marriages, polygamy, strong family ties and religion are the most important.

Low Education

It was found out that higher education of women tends to delay their marriage while lower education encourages girls to marry at a younger age. In Kamwezi sub-county, women's education is lagging behind. However, it is of recent that some organisations like World Vision have tried to improve the education of the girl child.

For women with college degrees, the high rate of child bearing is in their early 30 and perhaps signals the preferred time for child bearing by this group which is not the case with the uneducated who start producing as early as 15 years. According to Birth rates and fertility rates (1994), first birth rates for women in their 30's with a college degree are 2 to 5 times the first birth rates for women with less education which signifies low education being one of the reasons for high population growth in the area like Kamwezi sub county.

Religion

In Kamwezi sub-county, many people are religious and they take what their leaders tell them to do seriously. For instance the Catholics do not use modern methods of family planning because it is against the Biblical teaching of producing many children and filling the earth. Some methods of family planning like abortion are equivalent to killing a person and is therefore sinful if carried out.

It was therefore found out that due to religious teachings, the use of effective modern methods of family planning like the pill, injection, sterilization, vasectomy among others are neglected and the end result is high fertility rate which has led to population growth in Kamwezi sub-county.

Other causes of high population in the area

These included culture; which plays a big role population growth of the area. According to the discussion between the researcher and some few elders, it was found out that many parents want to have many children because of the need to continue the family line, get more support, look after cattle, buy clothes for them, build the father's home and care for parents during old age. Other reasons given by the respondents in favour of many children include looking after the young ones, helping around the house and bringing bride wealth.

Early marriages also contributed to high population in the area. Therefore, because of this the entire reproductive life of women is spent in marriages which results in high fertility rates hence high population growth. Therefore, early marriages in the case of girls are a major cause of high population growth in Kamwezi sub-county.

Polygamy was another cause of high population growth in Kamwezi sub-county due to the fact that women in polygamous families compete in terms of child bearing. They see it that the more children one produces especially boys, the more property that woman can inherit from the man. Culture plays a big role in polygamous families as children are viewed as a source of labour, protection and wealth hence leading to high population growth in Kamwezi Sub County.

4.5.2 The Effect of Population Growth on the Land of Kamwezi Sub-County

It was observed that population increase in Kamwezi sub-county has been brought about by early marriages, high fertility rates, cultural factors like polygamous marriages and the refugee influx into the area. Such increase in population numbers with no increase on land or land improvement has brought some negative effects on the environment. Some of these effects include land shortage which has also led to swamp reclamation, bush burning, overgrazing, over cultivation and land fragmentation all leading to increased soil erosion.

Most people therefore, have over used the land without even caring about its management. It was noted that overgrazing, over cultivation and bush burning have yielded soil infertility through erosion.

Land Fragmentation

Because of high population density, land fragmentation is common and as a result, most holdings are very small. The practice among many peasants of Kamwezi sub-county is that after the death of the head of household, his land is sub-divided into pieces among his sons. The phenomenon of land sub-division continues with each generation on the customary free hold lands. It is important to note here that the farms are not consolidated, instead the plots are scattered on landscape, in valleys, on the slopes of hills, on top of hills and in the reclaimed swamps. It was therefore difficult to establish the size of land for each farmer interviewed; some plots were even very far from homesteads up to 8 (eight) kilometres.

Over Cultivation

In Kamwezi sub-county due to population growth as a result of the refugee influx, high fertility rate, improvement in health care and agriculture, there has been over cultivation of the land due to the need for more food to feed the big number of people. This is further complicated by the fact that in Kamwezi sub-county there is a problem of land fragmentation which necessitates over cultivating of the small piece of land because of the need for food. In natural conditions, as plants grow, they extract the valuable mineral and organic plant nutrients from the soil, when they die, they decay and release their nutrients, returning them to the soil which is thus enriched for other plants that come after them. However, it was found out that because of over

cultivation of the soils year after year or season after season, there is poor plant growth due to the availability of fewer nutrients in the soils. Thus there are no plant nutrients that are replaced after the growth of poor plants and this has led to crop failure.

Over Grazing

Environmental degradation was experienced in many parts of Kamwezi sub-county due to over grazing especially in the parish of Kibanda. Many people in that parish keep large herds of cattle which have caused soil erosion through over grazing. It should be noted that as animal grazing is dependent upon either natural or man planted grasses and herbs which are eaten by the cattle, sheep and goats; the number of animals that can be grazed depends on the carrying capacity of the pasturage (the number of animals which can graze on the pasture without completely killing or destroying the grasses or other plants). According to the sub-county Agricultural Officer, Kamwezi has quite a big number of animals that is 19,400 cattle, 7348 sheep and 11,140 goats; this has resulted into over grazing. If the number is within the carrying capacity, the grass is able to grow again, but in Kamwezi sub-county because of population growth which has resulted into shortage of land for agriculture and settlement purposes

Quarrying

In Kamwezi sub-county, because of population growth, it was found out that quarrying is one of the economic activities that are being carried out in order to get money for health care, buying food and clothes and building of shelter. Quarrying as an activity is not all that bad but the way it is carried out in Kamwezi sub-county is the one which is not good. For instance pits are not covered with soil and there is destruction of vegetation cover which has accelerated the problem of soil erosion in the parishes of Rwenyangye, Kigara, Kyabuhangwa and Kashekye.

Other effects included; Wetland reclamation according to research findings Kamwezi sub-county is one of densely populated sub-counties in Kabale District. As a result of this people are forced to reclaim wetlands in order to create land to growth enough and rear animals. This is especially done in Rwenyangye, Kibanda and Kigara parishes. Therefore, according to research findings, due to population growth, there

has been shortage of land for settlement and agricultural purposes. To solve this problem, people reclaimed wetlands and this has brought negative consequences as stated above.

Bush Burning is another effect of high population growth in the area; according to the research findings bush burning is a common phenomenon during the dry season. It is mostly practiced in the parishes of Kibanda, Rwenyangye, Kigara and Kashekye because of the need for fresh pasture for animals (cattle, sheep and goats). This form of land degradation is also practiced by people due to the need for fire wood. Others use this method (bush burning) as a way of land clearing for agriculture.

In conclusion, it was found out that population growth in Kamwezi sub-county has negatively affected the land of the area and it has pushed the communities to nearby districts of Kibale and Mubende. This is due to the fact that as population grows, the demand for land for settlement and agriculture purposes also increases. In addition and sustainable practices like burning and razing tropical forests in order to grow enough food, this has made depletion of fragile arable land.

4.5.3 Possible Solutions to the problems caused by population growth on the land of Kamwezi sub county

From the research findings, there have been a number of issues raised on how these problems could be looked into to provide the people with short and long term possible solutions.

Controlled Animal Grazing

Since there is evidence that the area experiences a problem of overgrazing, respondents suggested that there should be restricted animal rearing (grazing) to certain parts of the landscape such as hill tops and low lands. This can be done by paddocking or fencing so as to have controlled grazing. Also the Rwandese who bring their herds of cattle from across the country should be stopped. This will help in reducing the livestock density in the area. Good quality animals should also be introduced instead of the indigenous poor quality ones.

Conservation of Wetlands

In Kamwezi sub-county there is need to conserve the available wetlands which are being degraded by the local people because of the need for more land for agricultural purposes. Wetlands in the area should be gazetted and illegal inhabitants should be prosecuted and relocated elsewhere. There should be wetland inventory in the area to list the different resources available in them and a community wetland management committee should educate the people on the value of wetlands, monitor and ensure proper conservation.

Re- afforestation and afforestation programmes

Since there is a problem of deforestation in Kamwezi sub-county, both the local people and authorities at all levels should pay attention to this problem. This problem is mostly experienced in the parishes of Rwenyangye, Kyogo and Kashekye because of the need for timber, charcoal and firewood. This problem has increased soil erosion in the areas mentioned and therefore re-afforestation in the deforested areas as well as fresh tree planting programmes should be encouraged. Strict forest laws have to be put in place and licences given to few people to carry out activities (charcoal burning, firewood collection, and lumbering) in the forests. The community should be sensitised on other sources of power such solar energy and biogas (for those people who can afford them) as alternatives to the use of fuel wood. The local people should also be sensitised about the use of forests including climate modification, soil erosion control, provision of food (fruits, roots, wild animals and birds) and recreational values. It is therefore from here that re-afforestation and afforestation have to become a community-based program.

Use of Improved Agricultural Methods

Agriculture forms the back bone of the economy of Kamwezi sub-county, and therefore its sustainability is vital to the area. Improved agriculture should aim at the use of modern methods of farming such as inter cropping, mixed cropping, crop rotation, application of fertilisers, growing of cover crops, mulching, terracing, irrigation, and genetically modified seeds. Agricultural modernisation should involve agricultural field workers, provision of demonstration farms, sensitization and supply of agricultural inputs like seeds and farm equipment. Therefore, there is need to

ensure that the local people access information and materials required so as to improve agricultural production in the area.

Land refilling after quarrying

The problem of open land as a result of quarrying should be solved by land refilling where mining pits are covered up after removing the required material like sand, clay and stones. Quarrying in the area has caused problems such as disfiguring of the land surface and soil erosion. Such areas after refilling should again be utilized for other activities. Those who carry out quarrying should be monitored by the local councils to do land refilling. This should be done in the parishes of Kashekye and Rwenyangye.

Migration; due to land shortage in Kamwezi sub-county, people should be allowed to migrate and settle in other parts both within and out of Kabale district. This to some extent will reduce population pressure on land and create more space for farm land. Family planning should also be encouraged among the population of Kamwezi Sub County among other solutions as presented in table and figure 3 above.

In conclusion, as a way of solving the problems brought about by population growth in Kamwezi sub-county, the key stakeholders have done something to change the situation; for example the government has addressed this issue of family size and advocating for four children per household.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents conclusions of the research and recommendations made by the researcher to address the effects of population on land in Kamwezi Sub County.

5.1 Conclusions

After along process of data collection and analysis, it is apparently clear that population growth and land degradation problem in Kamwezi sub-county is not a new phenomena but an old one. Kagambirwe, E.R. (1972) in his research on "*causes and consequences of land shortage in Kigezi*" found out similar situation as that in Kamwezi Sub County. Findings revealed that it is likely to continue if necessary steps to control population growth in the area are not taken by concerned individuals and organizations.

According to the findings, it was found out that although the Rwandese refugee influx into Kamwezi sub-county has caused population growth in the area, it is not necessarily the only major cause. Bongaarts, J. (1987) in his publication "*A framework for analyzing the proximate Determinants of Fertility,*" also notes several causes of high population growth. Therefore, this research has revealed that other factors such as high fertility, low education, culture, strong family ties, and religion together with others like relative political stability, improvement in health care and agriculture have contributed greatly in as far as the population growth of Kamwezi sub-county is concerned as this can also be revealed in Kagambirwe, E.R. (1972) in his research on "*causes and consequences of land shortage in Kigezi*"

Also findings show that population growth in Kamwezi sub-county has negatively affected the land of the area. This is due to the fact that as population in Kamwezi sub-county has grown, the need to clear more land for agriculture and settlement purposes has also increased. This is in agreement with Robert, A.M. *et.al.* (1965) who carried out a similar research on "*World population growth and response*". Therefore because of this; different problems such as over cultivation, bush burning soil erosion, wetland reclamation, land fragmentation and over grazing have been experienced in the area.

Like any other part of the world, it was found out that Kamwezi sub-county is experiencing different problems due to population growth. There are different steps that are being taken by both the local people and different authorities at all levels to solve them. Such steps include: controlled animal grazing, conservation of wetlands, re-afforestation and afforestation programmes, use of improved agricultural methods, land consolidation, land refilling after quarrying, migration, family planning, education for all and loaning system. All these have been put in place to solve the different problems brought about by population growth in Kamwezi sub-county.

5.2 Recommendations

The research carried out in Kamwezi sub-county has revealed the various problems brought about by the effect of population growth in the area. Although the community and authorities have come up with a number of programmes and services to reduce on the problems, there is still a lot to be done as expressed in the following recommendations:

Need to stop land fragmentation

The problem of land shortage due to the increase in population still needs serious attention. The researcher recommends that there should be regulations put in place to restrict the buying and selling of land. By putting in place Local Land Board Committees to regulate environmental issues including monitoring the projects done the land.

Controlled Grazing:

As there is a problem of over grazing in the area associated with movement of herdsmen and their cattle from Rwanda in search of pasture, the researcher recommends that such movements should be restricted by introducing bylaws in the area that prohibit such movements. Controlled grazing can also be achieved by minimizing the number of animals possessed by the herdsmen, use of paddocking and zero grazing system, this in the long run would minimize the problem of soil erosion.

Forming of committees:

The researcher also recommends that there is need to form committees for managing common property resources such as forests, wetlands and pasture for the benefit of all

the people in the area. This can be done through involving the National Environmental Management Authority (NEMA) officials in selecting members at local council level in the different parishes, such committees should include; land board committee, wetlands committees and the general natural resources committee to oversee the activities done on natural resources in the sub county of Kamwezi.

Practicing of family planning:

To solve the problem of population growth in Kamwezi sub-county, the researcher recommends that people should be encouraged to practice family planning methods. This can be done by local council leaders (stakeholders) in collaboration with the ministry of health and other health providers in the area to encourage people in this area to use modern family planning methods such as use of contraceptives, condoms, abstinence among others.

Education for all children:

In order to increase age at first marriage, the researcher recommends that there is need to encourage all children to complete primary seven and go for post-primary education. This reduces on the age at which the girl first gives birth and this can be done through encouraging girl child education by putting there incentives such as bursaries for girls, among others.

Agro-forestry:

In order to control soil erosion, the researcher recommends that for areas at high risk of erosion, selected species of trees should be combined with crops to maintain soil fertility, conserve water, reduce erosion and create fuel wood lots and a favourable micro-climate. This can be done by providing the farmers with plant seedlings and credit facilities in form of loans to facilitate agro-forestry in the area.

The role of United Nations High Commissioner for Refugees

As a way of solving the refugee problem in Kamwezi sub-county, the researcher recommends that the United Nations High Commissioner for Refugees should step up its involvement in catering for the refugees. This can be in form of organizing the logistics of settling the refugees, distributing food and initial relief; investigating

individual cases, attempting to replace refugees in employment or educational establishment and organizing repatriation.

Need for research

The researcher also recommends that there is need for more research in related issues such as Integration of refugees and the indigenous people of Kamwezi sub-county, Gender and land degradation in Kamwezi sub-county, Migration and development in Kamwezi sub-county, Non-governmental organizations and the development of Kamwezi sub-county and Agriculture and environmental damage.

REFERENCES

The Uganda Demographic and Health Survey (2000-2001)

Bongaarts, J. (1994). "Can the growth of human population feed itself" In scientific American, Pp 36 – 42.

Bongaarts, J. (1987). "A framework for Analyzing the proximate Determinants of Fertility," Population and Development Review, vol. 4, 1st March 1978.

Royal Society (UK), (2009). The Impact of Population Growth in Tomorrow's World

Frances, M.L. and Schurman, R. (1989). Taking population seriously, Earthscan publications Ltd. London.

Hamilton, A.C. (1984). Deforestation in Uganda. Oxford University press, London.

Jhingan M.L (1997), The Economics of Development and Planning, New Delhi, Vrinda publications (p) Ltd.

Jones, H. (1990). Population Geography, 2nd Edition, Paul Chapman publishing Ltd., London.

Kagambirwe, E.R. (1972), Causes and consequences of land shortage in Kigezi. Occasional paper No. 23, Department of Geography, Makerere University (unpublished).

Kakinda (1992). The tools and practices of Social Research, Department of Sociology, Makerere University.

Kpedekpo, G.M.K. and Serunjogi, M.S. (1976). The population of Uganda: Makerere University (Unpublished monography).

- Lappe F.M. and Schurman R. (1989), Taking population seriously, London, Earth Scan publications Ltd.
- Harte. J (2007), Human Population as a Dynamic Factor in Environmental Degradation
- Ministry of Health (1996), Uganda Demographic and health survey 1995, Maryland macro international Inc.
- NEMA (1987). State of Environment Report for Uganda 1996, Advance Printing Company pty Ltd.
- NEMA (1999). State of Environment Report for Uganda 1998, Advance Printing Company pty Ltd.
- Hollander, Samuel (1999), The Economics of Thomas Robert Malthus; University of Toronto Press
- Ntozi J.P *et al* (1990), "Some Aspects of Determinants of Fertility in Ankole, Uganda: Findings of Elders Survey," Institute of Statistics and Applied Economics, Makerere University Kampala, Unpublished.
- Banyankole of South Western Uganda, Marianum press, unpublished Kampala.
- Pickering K.T et al (1994), An introduction to global environmental issues, New York, Routledge.
- Robert, A.M. *et.al.* (1965). World population growth and response: 1965 – 1975. A decade of global action, Population Reference Bureau, Inc, Washington.
- Timberlake Iloyd (1985), Africa in Crisis: Causes and cures of Environmental Bankruptcy, Earthscan Publications Ltd. London.

APPENDICES
APPENDIX I: QUESTIONNAIRE

Dear respondent,

My name is **Ngabirano Betty**, a Development Study Student, from College of Humanities and Social Sciences, Department of Development Studies – Kampala International University. I am carrying out a research on population growth and land degradation in Kamwezi sub county. I therefore kindly request you for help to have this exercise completed by filling in this questionnaire. The information given here is highly confidential and strictly for academic purposes.

SECTION A

1. Name
2. Sex.....
3. Age.....
4. Parish

SECTION B

5. What do you think are the causes of high population growth in Kamwezi sub county?
 - (i)
 - (ii)
 - (iii).....
 - (iv).....
 - (v)
6. What are the effects of high population growth on the land in Kamwezi sub county?
 - (i)
 - (ii)
 - (iii).....
 - (iv).....
 - (v)

7. What do think can be done to solve the above problems caused by high population growth in Kamwezi sub county?

- (i)
- (ii)
- (iii).....
- (iv).....
- (v)

Thank you very much for your cooperation

APPENDIX II: INTERVIEW GUIDE

Dear respondent,

My name is **Ngabirano Betty**, a Development Study Student, from College of Humanities and Social Sciences, Department of Development Studies – Kampala International University. I am carrying out a research on population growth and land degradation in Kamwezi sub county. I therefore kindly request you for help to have this exercise completed by filling in this questionnaire. The information given here is highly confidential and strictly for academic purposes.

INSTRUCTIONS

Please tick where appropriate!

SECTION A

1. Name
2. Sex Male Female
3. Age 25 – 30 31 - 35 36 – 40 Above 40
4. Parish

SECTION B

5. What do you think are the causes of high population growth in Kamwezi sub county?
 - (i)
 - (ii)
 - (iii).....
 - (iv).....
6. What are the effects of high population growth on the land in Kamwezi sub county?
 - (i)
 - (ii)
 - (iii).....

(iv).....

(v)

7. What do think can be done to solve the above problems caused by high population growth in Kamwezi sub county?

(i)

(ii)

(iii).....

(iv).....

(v)

Thank you very much for your cooperation