FERTILITY RATE, MORTALITY RATE AS CORRELATES TO POPULATION GROWTH IN UGANDA (1960-2015)

BY

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DECLARATION

I MWESIGWA ALAFA, declare to the best of my knowledge and understanding that this research report is my original work under the guideline of my supervisor MR. MWEBESA EDSON with exception of the references quoted and has never been presented for any award to any University or any institution of learning.

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APPROVAL

This is to certify that this research report has been under my personal supervision and is now ready for submission to the Department of Economics and Applied Statistics of Kampala International University.

Signature.............................. Date....11/07/2017..........................

MR. MWEBESA EDSON

SUPERVISOR

DEDICATION

Special dedication goes to my loving Mum Ms. BYOGERO ESTHER, Brother KUNGU DENIS and Uncle ISABIRYE ROBERT for their unreserved Love, care and tireless support towards my success. May the Almighty God reward and bless the works of their hands.

ACKNOLEDGEMENT

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ABSTRACT

This research investigates the effect of fertility rate and mortality rate on population growth in Uganda from 1960-2015. Using both multiple and simple regression analysis, my objectives were; to find out the trend of mortality rate in Uganda, to find out the trend of fertility rate in Uganda, to find out the trend of population growth in Uganda, to investigate the effect of fertility rate on population growth in Uganda, to investigate the effect of mortality rate on population growth in Uganda and to investigate the effect of fertility rate on mortality rate in Uganda. The study followed a quantitative, correlational and descriptive design and it involved multiple and linear regression of the variables. From the analysis carried out, I found out that both fertility rate and mortality rate are both decreasing and evidenced from the trend chats but population growth has experienced a steady increase over the study period. Mortality rate and fertility rate had a negative effect on population growth. Mortality rate had a positive effect on fertility rate. From the purpose of the study that was investigating the effect of mortality rate and fertility rate on population growth in Uganda and I found out that both fertility rate and mortality rate had a significant effect on population growth in Uganda. However, the two independent variables were highly correlated and out of the regressions of each independent variables with population growth and by comparing the R^2 values and the standard errors, I found out that mortality rate had a more significant effect on population growth than fertility rate since it had a high R^2 value and least standard error. In conclusion, mortality rate is more significant in determining population growth in Uganda from 1960-2015.

LIST OF ACRONYMS/ABBREVITIONS

ADB	:	African Development Bank
ANOVA	:	Analysis of Variance
DHS	:	Demographic and Health Survey
FR	:	Fertility Rate
H_a	:	Alternative hypothesis
H_o	:	Null hypothesis
IMR	:	Infant Mortality Rate
MoFEP	:	Ministry of Finance and Economic Planning
MR	:	Mortality rate
NPHC	:	National Population and Housing Census
PRB	:	Population Reference Bureau
RJ	:	Ryan Joiner
SAS	:	Sub Saharan Africa
SPSS	:	Statistical Package for Social Scientists
TFR	:	Total Fertility Rate
UBOS	:	Uganda Bureau of Statistics
UNFPA	:	United Nations Finance and Planning Authority
UNICEF	:	United Nations Children Educational Fund
UNPP	:	Uganda National Population Policy
VIF	:	Variance Inflation Factor

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CHAPTER ONE
INTRODUCTION

1.0 Introduction

This chapter consists of the background of the study, problem statement, the objectives of the study, research hypotheses, scope of the study and the significance of the study

1.1 BACKGROUND OF THE STUDY

This covers the historical, theoretical, conceptual and contextual backgrounds

1.1.1 HISTORICAL BACKGROUND

Globally, the total number of people who have ever lived on earth was estimated by Carl Haub in 2011 to be 108 billion people but today, the population represents 6.5% of the overall population. According to the UN reports (2015), there are more than 7 billion living humans on Earth, yet 200 years ago we numbered less than 1 billion which shows a big change. Recent estimates suggest that 6.5% of all people ever born are alive right now. This is the most conspicuous fact about world population growth. For thousands of years, population grew only slowly, but in recent centuries it has jumped dramatically. Between 1900 and 2000 the increase in world population was three times greater than the entire previous history of humanity– an increase from 1.5 to 6.1 billion in just 100 years. A picture of world population in the very long-run fits the pattern of exponential growth Malthus (1798). Yet an empirical observation of how growth rates have developed in the course of the last century reveals that this pattern no longer holds. The annual rate of population growth has recently been going *down*. A long historical period of accelerated growth has thus come to an end; the annual world population growth rate peaked in 1962, at around 2.1%, and has come down to almost half since around 108 billion people have lived on our planet. This means that about 6.5% of all people ever born are alive right now. The following visualization plots estimates of the world population from 10,000 BCE to today. As it can be appreciated, before 1,000 CE the population slowly but steadily increased, going from about 2.4 million in 10,000 BCE to 295 million in 1,000 CE. By 1850, the world population had exceeded 1 billion people. It is possible to add the UN (2002) projection to show the projected increase until the end of the 21st century. The growth rate of 1.2 percent between 2000 and 2005, when applied to the world's 6.5 billion population in 2005, yields an annual increase of about 78 million people. Because of the large and increasing population size, the number of people added to the global population will remain high for several decades.

According to the United Nations Population Division report (2015), the last 100 years has seen an incredible increase in the planet's population. Some parts of the world are now seeing smaller increments of growth, and some, such as Japan, Germany, and Spain, are actually experiencing population decreases. The continent of Africa, however, is not following this pattern. Now home to 1.2 billion (up from just 477 million in 1980), Africa is projected to see a slight acceleration of annual population growth in the immediate future. In the past year the population of Africa continent grew by 30 million. By the year 2050, annual increases will exceed 42 million people per year and total population will have doubled to 2.4 billion, according to the UN. This comes to 3.5 million more people per month, or 80 additional people per minute. At that point, African population growth would be able to re-fill an empty London five times a year.

According to the National Population and Housing Censuses reports, by 1991, the population of Uganda was 17.69 million, and it increased to 24.95 by 2002 and by 2014, it had reached 37.18 million people. (NPHC 1991, 2002, 2014). This shows a big increase in the size of the population over years. According to the Uganda population stabilization report (2011), the population doubled in size from 12.6 million in 1980 to 24.4 million in 2002. According to this report, the population was projected to be 34.1 million people by 2012 with 14.7% urban population and Kampala was projected to have 1.72 million people by mid of 2012 and at the current growth rate of 3.2%, the population is expected to double again at 49.2 million by 2022-medium variant fertility and up to 130 million in 2050 according to the National Population Policy (NPP). The annual population growth rate is projected to increase from an estimated 3.3% per annum in 2007 to 3.5% per annum in 2011 and then start to decline back to 3.3% per annum in 2017.

1.1.2 THEORETICAL BACKGROUND

This study was based one theory which explains population growth, fertility rate and mortality rate. That is the theory demographic transition.

The demographic transition theory was sketched by Thompson (1930) and Notestein (1953). According to this theory, modernization was attributing the main cause of demographic transition that every society that undergoes modernization will first have a decline in fertility (Kirk, 1996). This theory explains fertility and mortality in relation to population growth. This theory was further developed by Kurt Mayer in 1962. And he stated it, "Any meaningful interpretation of the cause and effects of population changes must extend beyond formal statistical measurement of the components of change, i.e. fertility, mortality and migration, and draw on the theoretical framework of several other disciplines for assistance (Mayer 1962)." This theory will be used because it talks about the three variables of interest in my study that is population growth, fertility rate and mortality rate.

1.1.3 CONCEPTUAL BACKGROUND

The independent variables of the study are mortality rate and fertility rate. According to OECD (2016), fertility rate is defined as the total number of children that would be born to each woman if she were to live to the end of her child-bearing years and give birth to children in alignment with the prevailing age-specific fertility rates. It is calculated by totaling the age-specific fertility rates as defined over five-year intervals. Together with mortality and migration, fertility is an element of population growth, reflecting both the causes and effects of economic and social developments. The reasons for the dramatic decline in birth rates during the past few decades include postponed family formation and child-bearing and a decrease in desired family sizes. This indicator is measured in children per woman, (OECD Labour Force Statistics Publication 2016).

UDHS (2011) defined fertility rate as the number of children a woman would have by the end of her child bearing age if she were to pass through those years bearing children at the current observed age specific rates. And with reference to Uganda, the fertility rate in 2011 was 6.2 children per woman. According to this research fertility rate was defined as ratio of live births in an area expressed per 1000 population per year.

The Medical Dictionary, (22nd June 2010),Mortality rate also known as death rate, is a measure of the number of deaths (in general, or due to a specific cause) in a particular population, scaled to the size of that population, per unit of time. Mortality rate is typically expressed in units of deaths per 1,000 individuals per year; thus, a mortality rate of 9.5 (out of 1,000) in a population of 1,000 would mean 9.5 deaths per year in that entire population, or 0.95% out of the total. It is distinct from "morbidity", a term used to refer to either the prevalence or incidence of a disease, and also from the incidence rate that is, the number of newly appearing cases of the disease per unit of time. (*The Medical Dictionary*, 22nd June 2010).

UDHS (2006) defined mortality rate as the number of people who die expressed as a percentage of the 1000 population in a given area at a given time period. According to the researcher, mortality rate was defined as the number of deaths during a particular period of time among a particular type of people expressed per 1000 population per year.

The dependent variable of the study was population growth. According to Bloom and Williamson (1998), Population growth (increase in population per 1000 population) is defined as the birth rate (number of births per 1000 population minus the death rate (number of deaths per 1000 population) minus net emigration. According to "The World Fact Book (2010)," population growth compares the annual change in populations, results from a surplus or deficit of births over death and balance of migrants entering and leaving the country. The rate may be positive or negative. According to this research, population growth was defined as the rate at which the number of individuals in a population increases in a given period, expressed as a fraction of the initial population.

1.1.4 CONTEXTUAL BACKGROUND

Uganda is a landlocked country in East Africa. It is bordered by Kenya on the east, the north by Sudan, by the Democratic Republic of the Congo on the west, by Rwanda on the southwest and by Tanzania on the south. It has an area of 241,038 square kilometres, of which the land area covers 197,323 square kilometres. I focused my research on Uganda because Uganda is a high populated country with a high population growth rate according to a series of reports published by the Uganda Bureau of Statistics. Experts warned that the population growth rate had not declined enough to enable Uganda to reap demographic dividend. Demographic dividend is defined by the United Nations Population Fund as, "the economic growth potential that can result from shifts in a population`s age structure, mainly when the share of the working age population (15-64) is larger than the non- working age share of the population (14 and younger, and 65 and older)." "As women and families realize that fewer children will die during infancy or childhood, they will begin to have fewer children to reach their desired number of offspring, further reducing the proportion of non-productive dependents," said Dr. John Ssekamatte, (New Vision 29, June 2015)

1.2 STATEMENT OF THE PROBLEM

High population growth in Uganda has been of great significance on Uganda's economy. Nobel Prize economist Kuznets (1956), as well as Boserup (1965, 1981) and Simon (1981) suggested many positive effects of population growth, including economies of scale, acceleration of technological progress, flexible market responses among others. However, in Uganda currently the population growth and the growth rate is too high. This is evidenced from the UBOS report revealed from the national housing and population census 2014. During the period 2002-2014, the population of Uganda increased from 24.2 to 34.9 million, an increase of 10.7 million over a period of 12 years, this gives a growth rate 3.03% which is a slight decline from the rate of 3.20 observed between 1991 and 2002. Uganda's high rate of population growth is mainly due to the high fertility rate levels (over 6 children per woman) that have been observed for the past four decades, combined with a faster decline in mortality levels, reflected by a decline in infant and childhood mortality rates as revealed by Uganda Demographic and Health Surveys (UDHS) of 2006 and 2011. According to Ssekamate (New Vision 29, June 2015), Uganda's high population growth rate fuelled by a high fertility rate of 6.2 children per woman (second highest rate in the world) was proving to be a derailment to progress. This rapid population growth is quite alarming. There will be less resources per person, less physical capital per worker, increasing dependence burden and also constrain the infrastructure all of which are economically worse (Coale and Hoover 1958). If the large family consists of many dependent children, there is an additional increase in poverty (Angemi, 2003). However, this rapid growth can be controlled through use of family planning to check on the fertility rate, empowering women through education, among others.

1.3 PURPOSE OF THE STUDY

This study aimed at investigating the effect of fertility rate and mortality rate on population growth, in Uganda from 1960-2015.

1.4 RESEARCH OBJECTIVES

1. To find out the trend of fertility rate in Uganda.
2. To find out the trend of mortality rate in Uganda.
3. To find out the trend of population growth in Uganda.
4. To investigate the effect of fertility rate on population growth in Uganda.
5. To investigate the effect of mortality rate on population growth in Uganda.
6. To investigate the effect of fertility rate on mortality rate in Uganda.

1.5 RESEARCH QUESTIONS

1. What is the trend of fertility rate in Uganda?
2. What is the trend of mortality rate in Uganda?
3. What is the trend of population growth in Uganda?
4. What is the effect of fertility rate on population growth in Uganda?
5. What is the effect of mortality rate on population growth in Uganda?
6. What is the effect of fertility rate on mortality rate in Uganda?

1.6 RESEARCH HYPOTHESES

The study was based on three hypothesis; one relating population growth and mortality rate, the other relating population growth and fertility rate and the last one relating fertility rate and mortality rate

Ho1: There is no significant relationship between population growth and fertility rate

Ho2: There is no significant relationship between population growth and mortality rate

Ho3: There is no significant relationship between mortality rate and fertility rate

1.7 SCOPE OF THE STUDY

Geographical scope

This study was based in Uganda as a whole because it is one of the countries experiencing a high population growth rate as reported by the different organizations such as UBOS, UNICEF, UNFPA as well as the researchers

Content scope

This study was focused on fertility rate, mortality rate and population growth. Fertility rate and mortality rate were the independent variables and population growth rate as the dependent variable

Time scope

This research was based on the data on fertility rate, mortality rate and population growth rate in Uganda from 1960 up to 2015 thus covering a time scope of 56 years

1.8 SIGNIFICANCE OF THE STUDY

This study will act as reference for other scholars who will intend to carry out their research about the same topic since it contains relevant information such as the data that can be used in other studies.

This study will also help to discover the effects of fertility rate and mortality rate on population growth rate thus it will be of great importance to the policy makers in deciding making basing on the findings of the study.

The study will also help the researcher get a deeper understanding of how mortality rate and fertility rate affect population growth in Uganda and also discover the relationship between the variables.

The research will be of a great importance to organizations who wish to study the trend of population growth, causes and also help to develop policies on population growth bsuch as family planning services to reduce fertility rate

CHAPTER TWO
LITERATURE REVIEW

2.0 INTRODUCTION

This chapter contains the review of the theories, review of the literature, the conceptual framework and the related literature or studies

2.1THEORETICAL REVIEW

The study was based on one theory that is the theory of demographic transition. The demographic transition theory was sketched by Thompson (1930) and Notestein (1953). According to this theory, modernization was attributing the main cause of demographic transition that every society that undergoes modernization will first have a decline in fertility (Kirk, 1996). The term modernization associated with industrializations and urbanization shift from high fertility to low fertility and high mortality to low mortality. Modernization initially led to decline mortality through improvement in health and nutrition and, subsequently, to a decline in fertility through improvement in economic and social conditions that make children costly to raise and reduce benefits of large families. Education is often identified as one potential driving force to this fertility decline. The demographic history of several European countries consistent with the classic demographic transition theory, that from the late 18th century onward, fertility and mortality declined in response to urbanization, industrialization and improvement of economic and social conditions (Mason, 1997). Classic transition theory is more successful and scholars use this theory extensively. However, Demographic transition theory has been the subject of critical debate among demographers in recent years. Hirschman (1994), for example, has questioned its overall utility. He has correctly observed that "over the past few decades' intensive research on demographic change in historical and contemporary societies has revealed complex patterns that do not fit neatly into earlier theoretical schema" (Hirschman, 1994). Together with this, the major weakness of demographic transition theory has the weak association of measure of modernization and fertility (Cleland and Wilson, 1987). The general concept of modernization complex and it is difficult to specify the component of modernization.

This theory was further developed by **Kurt Mayer in 1962** and according to him, fertility, mortality and migration are the key determinants of population growth. Any meaningful interpretation of the cause and effects of population changes must extend beyond formal statistical measurement of the components of change, i.e. fertility, mortality and migration, and draw on the theoretical framework of several other disciplines for assistance (Mayer 1962). A theory of epiemiologic transition, sensitive to the formulations of population theorists who have stressed the demographic, biologic, sociologic, economic and psychological ramifications of transitional processes, was conceived by this author few years ago. Recognition of the limitations of demographic transition theory and of the need for comprehensive approaches to population dynamics stimulated the development of this theory (Van Nort and Karon1955; Micklin 1968).

This theory focuses on the changes in patterns of health and diseases and on the interaction between these patterns and their demographic, economic and sociological determinants and consequences. This theory starts with the assumption that mortality rate is a fundamental factor in population dynamics. The clearest indication of mortality's dominant role in population dynamics is implicit in theories of population cycles. The cyclic rises and falls in population size that have been observed in pre-modern human populations reflect sequential phases of population growth and decline; disregarding the possible selective influences of migration, these cyclic movements must ultimately be accounted for in terms of the range of variation in fertility and mortality. Although the absence of continuous information on the actual levels of fertility and mortality in pre-modern societies precludes deterministic statements about their relative demographic impact, an assessment of the possible range of variations in fertility and mortality does allow probabilistic conclusions. Obviously, the range for fertility is framed by a biologic maximum and a realistic minimum shaped by fecundability, by female survival chances during fertile ages and by marriage and contraceptive practices. Because of the low motivation to limit births and the comparatively ineffective contraceptive methods available in pre-modern societies, the broadest range for fertility was probably about 30 to 50 births per 1,000 populations. In contrast, the range for mortality was much greater as there was virtually no fixed upper limit to the death rate. Although 30 deaths per 1,000 populations may be a reasonable approximation of mortality's lower asymptote, its upper asymptote in pre-modern societies could have been many times as high in epidemic and famine years. Consequently, even if fertility approached its biologic maximum, depopulation could and did occur as a result of epidemics, wars and famines, which repeatedly pushed mortality levels to high peaks. The scanty evidence that is available indicates that frequent and violent fluctuations characterized the mortality patterns of pre-modern societies and that the mortality level was extremely high even in the so-called good years. Caught between the towering peaks of mortality from epidemics and other disasters and the high plateaus of mortality dictated by chronic malnutrition and endemic diseases, life expectancy was short and human misery was assured. Several authors have suggested low yet fluctuating life expectancies on the order of 18 for ancient Greece (Angel and Pearson 1953), 22 for Rome, 17 and 35 for medieval Britain (Russell 1958), and 22, 26 and 34 in the sixteenth, seventeenth and eighteenth centuries, respectively, for Geneva (Landis and Hatt 1954). With such short life expectancy at birth, populations were typically young, and population growth was cyclic with only small net increments over long periods of time. Thus, more than any other single factor, fluctuating but always high mortality offers the most likely explanation of the slow rate of world population growth until 1650 A.D.

In the modern period after 1650 the growth curve of world population departed from the cyclic pattern and assumed an exponential form. However, mortality continued to be of overwhelming importance in determining population movements before the Industrial Revolution in the west, as is indicated by a number of studies (Chambers; Eversley 1957; Utterstrom 1965; Vielrose 1965). Vital statistics gleaned from several parish register studies show that both fertility and mortality were extremely variable and moderately high and that the range of variation in mortality was significantly greater than in fertility in the early part of the modern era, as shown in. No secular downward trend in mortality is apparent in any country before the middle of the eighteenth century, about the same time that population growth began to demonstrate an exponential curve. The initial period of sustained population growth in nearly every country for which reliable data are available corresponds with at least two decisive changes in the death rate. First the fluctuations in mortality became less frequent and less drastic. Second, the initial, slow—sometimes imperceptible—decline in mortality gradually gained momentum and eventually stabilized at relatively low levels in the twentieth century. Thus steady rises in life expectancy, progressively diminishing death rates and more stable and predictable mortality patterns have accompanied the persistent increments in world population.

2.2 CONCEPTUAL REVIEW

IV (FERTILITY RATE, MORTALITY RATE) DV (POPULATION GROWTH)

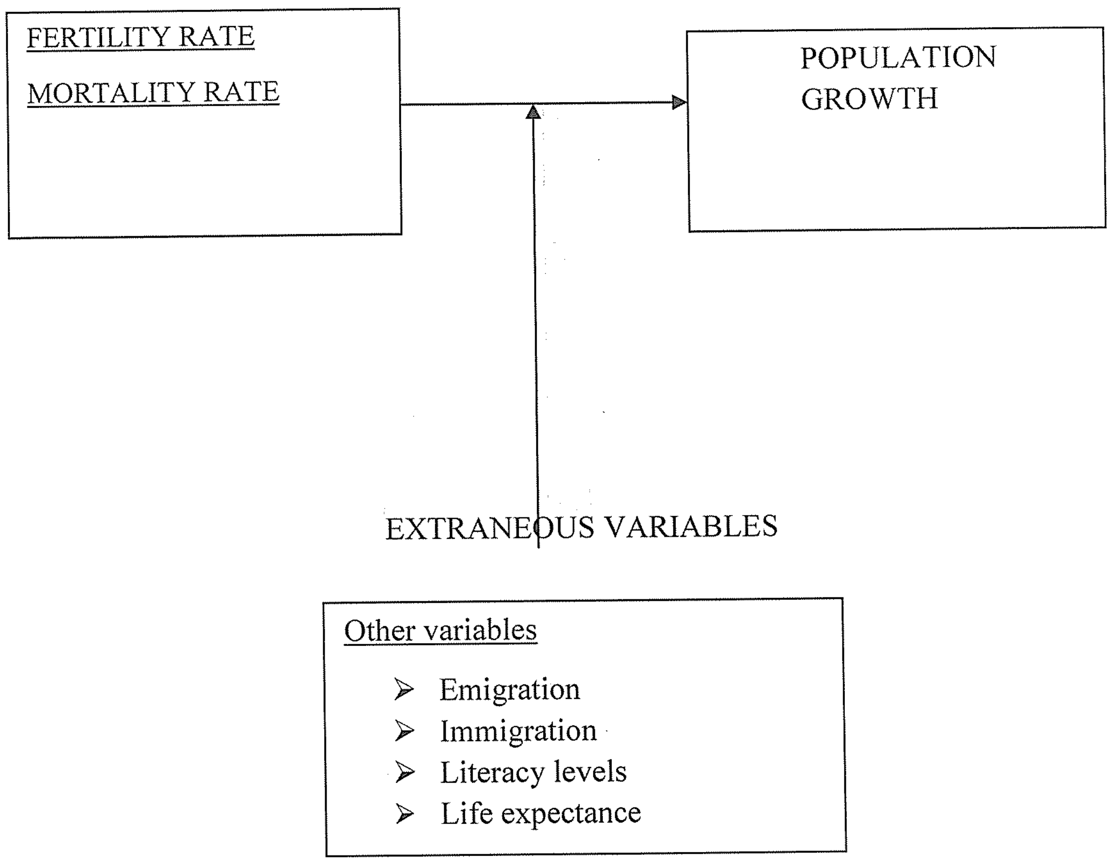


Figure 1: Shows the conceptual framework of fertility rate, mortality rate and population growth

The structure above shows the conceptual frame work of the IVs (fertility rate and mortality rate) where fertility rate is measured in terms of Number of birth rates per woman and the age specific birth rate. The second IV (mortality rate) is measured in terms of under five mortality rate and adult mortality rate. The DV (Population growth) is measured in terms of Demographics such as gender, age, education level, Size or the number of people and the density. There are other variables (intervening variables) that affect the DV such as Emigration, Immigration, Literacy levels and Life expectance.

2.3 RELATED LITERATURE

2.3.1 THE TREND OF FERTILITY RATE IN UGANDA

Fertility levels have remained high over the past 3 decades, with the Total Fertility Rate (TFR) of 6.2 children per woman. The Uganda Demographic and Health Survey (UDHS 2011), preliminary findings indicated that the TFR has reduced From 6.7 in 2006 to 6.2in 2011 children per woman. This represents a decrease of 0.5 children in the 5 years since the 2006 UDHS, when the TFR was 6.7 births per woman.(UDHS 2011) further reported that Fertility is significantly higher among rural than urban women (6.8 and 3.8, respectively). However, because of the small proportion of the population living in urban areas (less than 20 percent), the low urban fertility has only minimal impact on fertility for the country as a whole. The survey also shows a GFR of 217 live births per 1,000 women and a crude birth rate of 42 live births per 1,000 population. This is a decrease from 230 and 45, respectively, since the 2006 UDHS. By 2014, the fertility rate in Uganda had dropped to 5.92% indicating a continuous decline (UDHS 2014).

On 13th Jan 2015, Stephen Otage reported in Daily Monitor about the trend of fertility rate in Uganda. He reported that, "The trend of fertility has been attributed to the increasing levels of education, increased use of family planning services, improving quality of housing, the increasing costs of education and upbringing of children which are scaring parents from producing children they will not be able to bring up comfortably." The number of children produced by every woman of child-bearing age in Uganda has begun reducing, results from the 2011 national demographic survey have revealed. Mr Ben Paul Mungyereza, the executive director Uganda Bureau of Statistics, observed that the downward fertility trend is likely to continue this way for some time and it is a positive development indicator for the country because it will provide momentum for the population to increase without constraining the current resources because majority of Uganda's current population is below 18 years. This is a very big advantage because there is no economy which has developed at the same rate of rapid population growth... we are building the capacity to manage our population," he said.

2.3.2 THE TREND OF MORTALITY RATE IN UGANDA

There has been a general improvement in mortality levels over time. The IMR declined from 97 to 54deaths per 1,000 live births between 1995 and 2011, while the under five mortality declined from 162 to 90deaths per 1,000 live births over the same period. The UDHS (2011) report showed that IMR is lower among children in urban areas as well as those born to educated and wealthier mothers. This report also found out that mortality rate was high among male (6.5 deaths per 1000 population) than in female (5.3 deaths per 1000 population). According to this report, 20% of the women and 25% of the men were likely to die between the ages of 15-50 years. This gave a remarkable decrease in mortality rate for both men and women from 2000 up to 2011.

Roberts (2015), in his research about Measuring maternal and child health in Uganda found out that National estimates often veiled large differences in coverage levels and trends across Uganda's regions. Under-5 mortality declined dramatically, from 163 deaths per 1,000 live births in 1990 to 85 deaths per 1,000 live births in 2011, but a large gap between Kampala and the rest of the country persisted. Uganda rapidly scaled up a subset of interventions across regions, including household ownership of insecticide-treated nets, receipt of artemisinin-based combination therapies among children under 5, and pentavalent immunization. Conversely, most regions saw minimal increases, if not actual declines, in the coverage of indicators that required multiple contacts with the health system, such as four or more antenatal care visits, three doses of oral polio vaccine, and two doses of intermittent preventive therapy during pregnancy. Some of the regions with the lowest levels of overall intervention coverage in 1990, such as North and West Nile, saw marked progress by 2011; nonetheless, sizeable disparities remained between Kampala and the rest of the country. Countrywide, overall coverage increased from 40% in 1990 to 64% in 2011, but coverage in 2011 ranged from 57% to 70% across regions. The child and maternal health landscape in Uganda has, for the most part, improved between 1990 and 2011. Sub national benchmarking quantified the persistence of geographic health inequalities and identified regions in need of additional health systems strengthening. The tracking and analysis of sub national health trends should be conducted regularly to better guide policy decisions and strengthen responsiveness to local health needs. Kumar and Gemechis (2010) used data from Ethiopia DHS (2005) and employed cross tabulation technique to examine the selected socioeconomic, bio-demographic and maternal health care factors that determine child mortality in Ethiopia. The result showed that among socioeconomic variables, birth intervals with preceding birth had significant impact to lowering the risk of child mortality. The result conformed that the child mortality risk associated with 17 children of less than 2 years of birth interval with previous child was highest (15 percent) and lowest (4. 2 percent) for the children whose birth interval was 4+ years.

2.3.3 TREND OF POPULATION GROWTH IN UGANDA

Uganda's population has continued to grow rapidly over time. It increased from 9.5 million in 1969 to 24.2million as per the National population and Housing Census on 13th September 2002. Between 1991 and 2002 the population increased at an average annual growth rate of 3.2 percent, and the population was projected at 34.1 million by mid 2012Census population, (1969 – 2002). Population growth rate was about 3.4% per year between 1991 and 2002, which put Uganda among the countries with the highest population growth rates in the world. Uganda from the United Nations Population Division (2002).The demographic implications of this high population growth rate are fewer resources per person, less physical capital per worker, increasing dependence burden and also constrain the infrastructure all of which are economically worse as suggested by (Coale and Hoover 1958)

Kashambuzi on 4th August 2010, posted in the African Peer Review Forum a section on population growth (pages 283 through 285). The report noted that "Historically, high fertility rates strongly correlate with poverty and high child mortality rates…). The report further noted that "Recovering from civil war and an HIV prevalence rate that peaked at 30 percent in the 1990s, Uganda now has the third highest population growth rate in the world, estimated at 3.2 percent… The high population growth rate is driven by the country's high average total fertility rate of 6.9 children, one of the highest in the world". The report did not mention the influence of migration on Uganda's population growth. Uganda has a very liberal policy on migration and refugees. This dimension must be factored into Uganda's demographic equation. The report also did not mention that fertility has begun to decline albeit slowly. This report covered some causes of the high fertility rate. They include socio-cultural factors like early marriage, low educational levels, especially among females, pervasive poverty, low contraceptive use, general low socio-economic status of women and political statements that encourage large families in part because Uganda has low population density with negative political economy consequences. The recommendations for bringing down population growth include an increase in contraception to cover unmet needs, economic growth with equity, universal access to education, jobs, health care and development opportunities (sustainable human development) drawing on best practices around the world. The Forum suggested the formulation and implementation of a National Population Policy guided by: Education for and empowerment of women, promotion of scientific and technical development, promotion of new modes of production (modernization and commercialization of agriculture), promotion of 'growth with equity' and sustainable human development.

A few remarks on Uganda's population dynamics are in order at this juncture. First, the education and empowerment of women is very crucial in attaining optimal population growth rate. It must begin with the education of girls. The Uganda government and development partners must make a genuine effort to achieve this goal. Special arrangements need to be made to improve attendance and performance of girls. The enrolment rate needs to improve but more importantly the drop-out rate needs to be reduced significantly and performance improved. It has been demonstrated in developed and developing countries that school lunches reduce drop-out and improve performance of girls. By staying in school longer, girls marry late and reduce fertility – making family planning least controversial. Educated women get good jobs and incomes and become empowered including in determining their reproductive behavior in terms of the number of children they want and how to space them without pressure from their spouses. The Uganda government is aware of the benefit of school lunches but has reneged on their implementation.

Second, Uganda authorities and development partners need to make a concerted effort to promote growth with equity. Uganda's thirty years experience with structural adjustment program which focused on growth hoping trickle-down mechanism would distribute equitably the benefits of growth has demonstrated it did not work. James Gustave Speth, former Administrator of UNDP, remarked in 1998 that "Uganda is a leading example of an African country that is doing many of the right economic things to lift its people out of poverty. It has posted growth rates averaging over 6 percent a year for a decade. Yet two-thirds of the population remain in absolute poverty, and per capita income is only now approaching the level attained in 1970 [when Obote 1 government was overthrown]" (Development Cooperation Seminar 1999). Therefore the time has come to combine growth with equity.

Third, for population planning purposes, the government must disaggregate date showing the contribution of population growth due to migration (in-migration over out-migration and the children migrants produce while in Uganda) and to natural growth (excess of births over deaths), areas where population growth is high, moderate or low. Every effort should be made to avoid a one-size-fits-all approach. Population planning must also take into consideration short, medium and longer term outcomes to avoid population dynamics similar to what is happening in Europe, Japan, Russia, China, India and Mauritius. Given that Uganda is slowly crawling out of the HIV & AIDS pandemic and human destructive civil wars in the Luwero Triangle and northern and eastern Uganda population growth is expected as survivors replace their lost relatives. Forth, local communities especially opinion leaders must be included in matters related to population, it being one of the most delicate topics in Uganda's economic, social, cultural, religious and political set up.

Fifth, family planning programs must be demand and not supply driven in line with the Cairo International Conference on Population and Development (ICDP) of 1994. In a new family planning ethos, Judith Bruce and Anrudh Jain of the Population Council observed that "...it must now be considered irresponsible to manage and measure family planning programs by the use of targets or quotas for specific methods. For such criteria threaten the very ethos of client-oriented, high quality family planning services. Instead, the success and efficiency of family planning services should be evaluated by how well they enable people to meet their reproductive goals in a [safe and] healthy way... Finally, family planning programs must begin to play a part in supporting voluntary and equal sexual partnerships"(The Progress of Nations 1995). Uganda has been advised and has talked a lot about population growth. The time has come to develop and implement an appropriate policy according to specific location needs.

2.3.4 POPULATION GROWTH AND FERTILITY RATE

Fertility is the most important variable affecting population growth rate in most contemporary populations. The level of fertility in a population affects not only its current size, but also has a significant impact on its future rate of growth, as well as the current and future age structure of the population. Uganda has the highest TFR of the countries in Eastern and Southern Africa that have recently participated in the DHS program (PRB 2008). Uganda's population in 2007 was estimated to be 30 million and at the current rate of growth (3.2%) it is expected to reach 55 million in 2025. The continuation of high fertility and population growth poses serious challenges to future economic and social development. It has been noted that Uganda's quest to achieve the millennium development goals faces drawbacks due to the high population growth rates caused by high fertility (UNDP 2008, MoFEP 2008, and UN 2008). The total fertility rate in Uganda has remained high at an average of seven children per woman for over the last five decades (Lubaale, Kayizzi and Rutaremwa 2007), yet family planning started in Uganda over five decades ago to help lower this rate.

Uganda is following the Demographic transition in the pre- transition stage where the total fertility rate (TFR) is above five children per woman and shows very weak or no signs of decline. This study intended to model the levels and patterns of fertility in Uganda which would present the transition. Ugandan fertility has taken in the period 1988 to 2006 and project the fertility trend in the next 50 years. This will show when fertility is likely to begin its decline. The main objective of the study was to model the fertility levels and patterns in Uganda in the period 1988 to 2006. It based on the persistent high fertility in Uganda over the past decade. The study was empirical and applied mainly two fertility models. The Brass relational Gompertz model was used to estimate the fertility rates which showed the level and pattern of fertility and the Aggregate fertility model by Bongaarts and Potter (1983) was used to quantify the effect of the proximate determinants on fertility. The DemProj was then used to project the Total fertility Rate of Uganda in the next years up to 2050. The research used data from the 1988/9, 1995, 2001 and 2006 Uganda demographic and health surveys. It also used 1991 and 2002 population censuses. The datasets used were from the woman questionnaire and it focused on women aged 15-49 years. The study focused on the proximate determinants of fertility. Findings from application of the models showed that fertility in Uganda is quite high and on average it has been consistently above 6 children over the past decades. Projections show that

Uganda will still be in the transition stage by 2025 with an estimated TFR of 5.2 which is still above 5. Application of the Bongaarts model established that marriage had the strongest inhibiting effect on Ugandan fertility over the study period followed by postpartum infecundability. Contraception and abortion had the lowest inhibiting effects. This is because contraceptive usage is still very low and abortion is prohibited in the country. It is recommended that the population policy and programs should encourage effective family planning in the country especially in the rural areas because the percentage of women not using any contraceptive method is still high.

Leonid (2009), in his study about Foreign Aid, Fertility and Population Growth: Evidence from sub-Saharan Africa. The work considers population growth rate (PGR) and the directly related to fertility total fertility rate (TFR). Using a panel of main 43 sub-Saharan African countries during the last four decades of the 20th century, it demonstrates the positive association between population growth rate and foreign aid received in the previous year and suggests that foreign aid affects population growth primarily via its effect on fertility. The work also shows that in the direct estimation of the total fertility rate the coefficient estimated on once-lagged foreign aid is positive and significant as well. These findings suggest that the appreciation of the demographic effect of foreign aid can have important implications for the design of policies regarding to foreign aid for presently developing countries, particularly in sub-Saharan Africa. Basing on these two studies, it is clear that there exists a direct relationship between population growth and fertility rate.

2.3.5 POPULATION GROWTH AND MORTALITY RATE

Mortality is a fundamental factor in population dynamics; the clearest indication of mortality's dominant role in population dynamics is implicit in theories of population cycles. The cyclic rises and falls in population size that have been observed in animal and pre-modern human populations reflect sequential phases of population growth and decline; disregarding the possible selective influences of migration, these cyclic movements must ultimately be accounted for in terms of the range of variation in mortality. The range for mortality was much greater as there was virtually no fixed upper limit to the death rate. Although 30 deaths per 1,000 populations may be a reasonable approximation of mortality's lower asymptote, its upper asymptote in pre-modern societies could have been many times as high in epidemic and famine years. Population size of a family has been found to influence infections in many studies. When many people live together, the chance of contact with pathogens increases, and hygiene may deteriorate (Woldemicael 2001; Manun'ebo et al., 1994). A large number of children in a household increases the likelihood of having disease like infections because of crowding and competition for mother's time and attention and other resources (Woldemicael, 2001). In Eritrea, the probability of having diarrhea is about 60% higher if there are six or more children living in the house than if the number of children is less than three. In Ethiopia, the odds of having infections associated with the number of children remained significant even after controlling for all environmental, behavioral and other socio-economic variables.

2.3.6 MORTALITY RATE AND FERTILITY RATE

Since 1950 we have seen extremely strong correlations between reductions in mortality and reductions in fertility. A recent review states that:"A 'folk regression' of the fertility trend on the mortality trend would conclude that saving one life prevents two births." Furthermore no country has ever experienced a fall in fertility without first experiencing a fall in mortality. Contrary to popular belief, it does not look like we are heading towards an ever increasing population. Across most of the world, we have seen dramatic reductions in fertility accompanying drops in mortality. In Europe and North America the number of children per family has fallen to between 2 and 3 children, which keep the population at its current size. In Latin America and Asia, we have also seen rapid convergence to lower fertility rates, with many countries that were once characterized by large families now near the fertility rates of the richest countries. If family size remained at around 2 children we would see dramatic population growth over the next few decades due to decreased mortality, but ultimately by 2100 the population size would stabilize. But correlation does not mean causation. The drop in mortality since 1950 took place alongside many other developments such as economic growth, increasing levels of education, female empowerment, and provision and acceptance of family planning services. Although we might expect all of these trends to lead to decreased fertility, identifying the relative effect of each of these factors is extremely difficult. For one, it is plausible that there are complex causal relationships between each of these factors. Maybe a combination of increased education and decreasing mortality is needed to see any significant impact on fertility. Also, the desire to limit family size might struggle to translate into drastically lower fertility without widely available modern methods of contraception. Both Bangladesh and Niger have traditionally had large family sizes. Bangladesh has now reached a fertility rate of 2.4 children per women whereas Niger has a fertility rate of over 7 children per woman. It does not look like a high level of mortality is the main issue preventing Niger from reaching lower levels of fertility. In Bangladesh child mortality fell at a steady rate from 198.4 out of 1000 in 1980, to 143.7 out of 1000 in 1990. During this time total fertility dropped from 6.4 children per woman to 4.6 children per woman. Contrast this with recent developments in Niger: over a ten year period between 1998 and 2008, Niger experienced an even more dramatic fall in child mortality than was seen in Bangladesh, from 245.2 per 1000 to 141.4 per 1000, yet total fertility only fell from 7.8 to 7.6. To cite another example, Ethiopia and Uganda have similar levels of child mortality. In 2010, under 5 mortality was 75.6 per thousand in Ethiopia and 78.4 per thousand in Uganda. Both countries had seen large drops in child mortality since 1990 when under 5 mortality stood at 205 per thousand in Ethiopia and 178.7 in Uganda. Yet total fertility in Ethiopia presently stands at 4.8 children per woman as opposed to 6.2 children per woman in Uganda. Mortality declines in some developing countries may not be possible unless fertility declines below current levels (Palloni, 1990; Rosero-Bixby, in press).

Family planning programs could have offsetting impacts on natural rate of increase of a population as its fertility-related effects reduce the rate of increase while, simultaneously, its child mortality-related effects could potentially increase it (Trussell and Pebley, 1984; Bongaarts, 1987, 1988; Trussell, 1988; Potter, 1988; Palloni and Kephart,1989). In Uganda, the infant mortality rateand the under-five mortality rate show that out of a 1.000 live born children, 88 will die within their first year of life, and 152 within their first five years. Such high mortality rates are known to induce people to have many children, as they wish to have some children survive to adulthood (UBOS, 2001:99; Hashimoto &Hongladarom, 1981:784). Regarding changes in these variables, the infant mortality rate has remained rather constant at a high level, whereas the under-five mortality rate has fallen with ten points in the years prior to 2000 (UBOS, 2001:99). This could act as an initial enticement to reduce fertility, as the likelihood of children surviving their first five years of life has increased. Concerning the acceptable number of surviving children, Ugandan women describe their ideal family as consisting of 4.1 to 6.4 children (Blacker et al., 2005:364).

CHAPTER THREE

RESEARCH METHODOLOGY

3.0. INTRODUCTION

This chapter covers the research design, the research method, the population under study, the sampling procedure, and the method that was used to collect data. The reliability and validity of the research instrument are addressed. Ethical considerations pertaining to the research are also discussed. This part describes the frame work within which the research was conducted. The part presents the specified model, data source, model estimation technique and analysis.

3.1 STUDY DESIGN

The study was regressional, correlational and descriptive in nature since it involved multiple regression of the variables so as to generate the general model since the researcher was interested in finding the effect of fertility rate and mortality rate on population growth. Also linear regression was used so as to find the effect of one variable on the other. correlation of the variables was also carried out to find out the relationship between the variables. It was descriptive in a way that time series plot were generated so as to find the trend of the variables over time and also the probability plots were used to test for normality. These were used so as to ascertain and be able to describe the characteristics of variables of interest in question. The analysis was quantitative in nature since it was based on quantitative data set. This is because the data used was given in values or figures with respect to different time periods and mainly considered secondary data from different data sources to make conclusions and recommendations.

3.2 SAMPLING METHOD

A representative of values of mortality rate, fertility rate and population growth in Uganda was selected among a variety of values using purposive sampling method so as to use these figures for purposes of analysis to meet the objectives of this study and its intended interest.

3.3 SAMPLE SIZE.

The study involved a sample of 56 years putting into consideration all the determinants of mortality rate, fertility rate and population growth in Uganda. However costly this could be, a big sample is more desirable for analysis (Owolobi, 2003).

3.4 THE MODEL

The specified model took the following form.

Y=f (FR, MR).. (1)

Where;

Y = population growth.

FR = Fertility rate

MR = Mortality rate

Table 1: SUMMARY OF VARIABLE DEFINITIONS

Variable	Definition	Expected sign
Y	Population growth rate	Y dependent
FR	Fertility rate	+
MR	Mortality rate	-

SOURCE: ***Researcher 2017***

Investigation of the model

The F-test on the subset of regression coefficients was carried out just like the F-test on the entire or overall regression equation. Taking 5 percent level of significance, the test statistic was compared with the critical value of the F distribution to find out the significance of the overall model and the subset variables and the criteria was that if the test statistic was larger than the critical value, the subset of variables and the overall model was statistically significant. Also the specific objectives were investigated using correlations and bivariate regression to facilitate the estimation of the relative importance of FR and MR on population growth.

3.5 DATA SOURCES

Secondary annual data on both dependent and independent variables were extracted from the WDI CD-ROM 2008, Selected Statistics for African Countries by the ADB (2006), UDHS (2011), NPHC (1991, 2002, 2014). According to Maddala (1977), non-stationary time series are usually made stationary before analysis in order to avoid spurious regression results. The tests for stationarity, normality and multicollinearity using SPSS, STATA and MINTAB17 were carried out before making the analysis.

3.6. DATA COLLECTION METHODS

Document review

This involved the collection, study and critical examination of published materials from different organization such as UBOS reports, Census survey, DHS were all visited and the data got was statistically analyzed in line with the study objectives. Also recorded information related to the topic under investigation and/or study such as published articles from news papers and research journals were also used.

3.7. DATA ANALYSIS.

The data analysis involved reducing the data into manageable developing variables and applying statistical inferences. The analysis was basically regressional of both multiple and linear models depending on the study objectives. All the analysis was carried out at 5% level of significance and the computed F- values were being compared with the critical values so as to make inferences. Also, line graphs were used so as to find the trend of the variables. However, some preliminary tests such as testing for stationarity using the Dickey Fuller test, multicolliearity using the VIF and normality using probability plots were carried out. The analysis of the data involved use of a statistical computer package STATA 9, SPSS, MINITAB and the results were then used to carry out tests and interpretations in regard to the existing relationships among the variables. Consequently, the following steps were taken to analyze the data from the study. The data was entered into micro-soft excel, exported to SPSS, STATA and MINITAB7. The statistical packages; SPSS, STATA and MINITAB7 were used for the analysis. Data was presented in tabular form and graphic form.

3.8 LIMITATIONS OF THE STUDY

In the processes of carrying out the research these problems were encountered.

In view of the following threats to validity, the researcher claimed an allowable 5% margin of error at 0.05 level of significance this could not lead to accurate data production.

There was difficulty in collecting data since the mortality rates and fertility rate levels could not be acquired with ease. The scattered nature of the information made it difficult to attain and compile data with ease.

Despite all the above anticipated challenges, the researcher made efforts to adequately address them so as not to compromise the findings of the study in any way, so that the outcome reflects the majority view of the entire population.

3.9 ETHICAL CONSIDERATION

The researcher ensured honesty in data handling for example in a bid to attain information (mortality rate, fertility rate and population growth) information retrieved from right sources will be left unchanged.

The researcher recognized the contributory authors especially those authors from whom literature, related studies and theories were generated.

Data analysis estimation through secondary data processing was documented to enable the production of accurate information.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETTATION

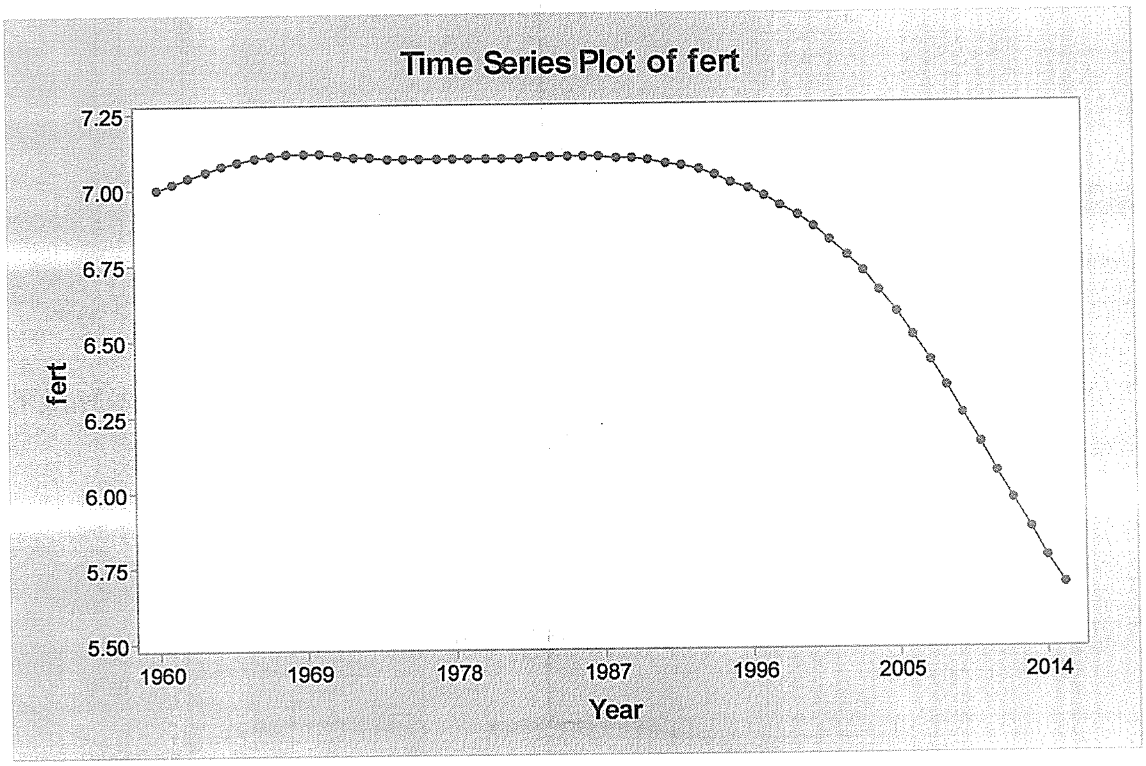
4.0 INTRODUCTION

This chapter presents the findings of the study with a clear interpretation of those findings to create a clear understanding of work the study revealed. The data was presented, analyzed, and interpreted quantitatively at 5% level of significance and the findings were based on the objectives of the study which were; To find out the trend of mortality rate in Uganda, to find out the trend of fertility rate in Uganda, to find out the trend of population growth in Uganda, to investigate the relationship between population growth and fertility rate, to investigate the relationship between population growth and mortality rate and to investigate the relationship between fertility rate and mortality rate. But before achieving these objectives, some preliminary tests were carried out that is; testing for normality of the data, and testing for stationarity since the data takes a time series trend.

4.1 THE TREND OF FERTILITY RATE IN UGANDA

To fulfill this objective, time series plot was plotted using MINTAB so as to investigate the general tendency and movement of fertility rate in Uganda from 1960-2015 that is to find out whether fertility rate has been increasing or decreasing over time. I also carried out regression of fertility rate with respect to time while considering time as the independent variable.

Figure 2: A TIME SERIES PLOT SHOWING THE TREND OF FERTILITY RATE IN UGANDA (1960-2015)



SOURCE: ***The world bank (2015) Data.worldbank.org***

From the MINTAB output in the figure above, fertility rate has been following a non-linear pattern and it picked its highest value in 1969. However, it started declining steadily from 1988 until when it was minimum in 2015. In general, fertility rate in Uganda has been decreasing over the study period

LINEAR REGRESSION OF FERTILITY RATE OVER TIME IN UGANDA (1960-2015)

A linear regression between fertility rate over time was carried out using STATA to find out linear relationship between the two variables. During this regression, time (Years) was taken to be the independent variable and fertility rate as the dependent variable. The regression model obtained was of the form;

$$\mathbf{FR = b_0 + b_1X + U_i}$$

Where

FR = Fertility rate, **X** = Time, **b0** = Constsnt, **b1** = coefficient of time and **Ui** = Error term

Table 2: LINEAR REGRESSION OF FERTILITY RATE OVER TIME IN UGANDA (1960-2015)

The results obtained from regression were at 0.05 level of significance.

```
. reg fert years
```

Source	SS	df	MS
Model	5.06496635	1	5.06496635
Residual	3.46772994	54	.064217221
Total	8.53269629	55	.155139932

Number of obs	56
F(1, 54)	78.87
Prob > F	0.0000
R-squared	0.5936
Adj R-squared	0.5861
Root MSE	.25341

fert	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
years	-.0186066	.0020951	-8.88	0.000	-.022807	-.0144062
_cons	43.8444	4.164138	10.53	0.000	35.4958	52.19299

SOURCE: ***The world bank (2015) Data.worldbank.org***

From the results above, the regression model obtained was;

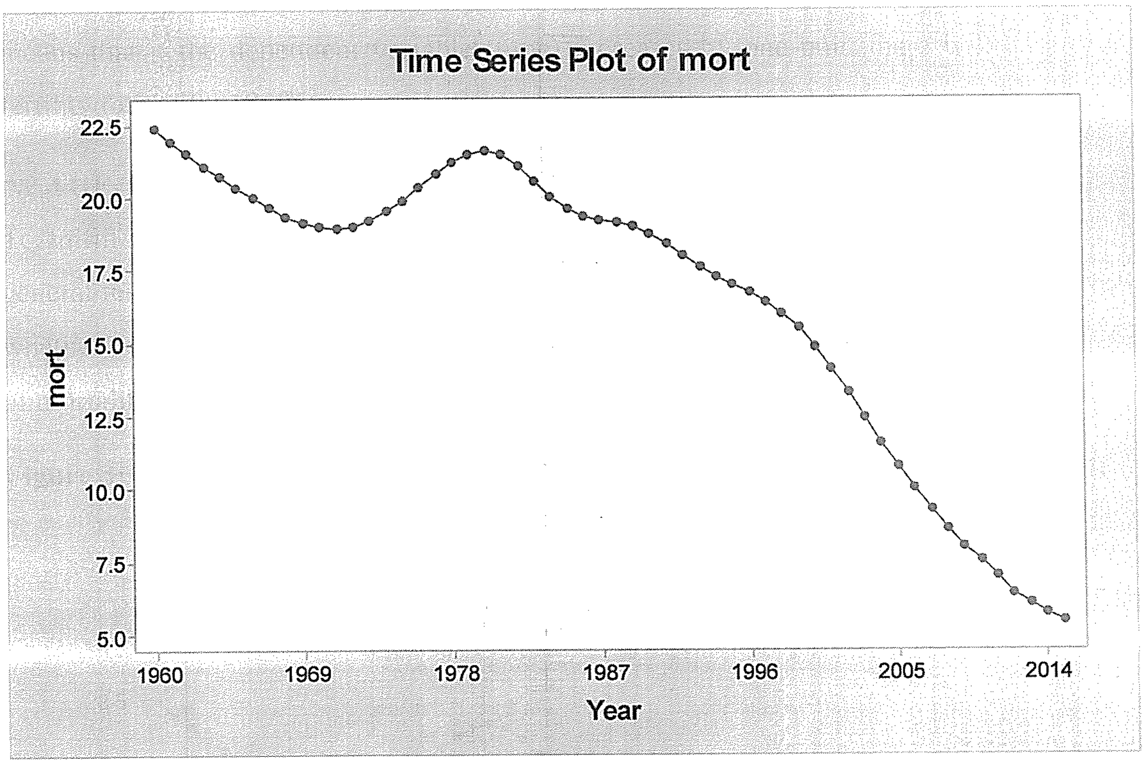
$$\mathbf{FR = 43.8444 - 0.0186066X + U_i}$$

The linear regression results from the table above indicates that time has a significant effect on fertility rate since F=78.87 and P-value (0.000) is less than 0.05. Basing on R^2 (0.5936), it means that time explains 59.36% variations in fertility rate. The constant $\mathbf{b_0}$ = **43.8444** means that without time, there will be a fertility rate of **43.8444.** The coefficient $\mathbf{b_1}$ = – **0.0186066** means that if the dependent variable (time) increases by one unit, there will be a decrease in fertility rate of **0.0186066.**

4.2 THE TREND OF MORTALITY RATE IN UGANDA

To fulfill this objective, time series plot was plotted using MINTAB so as to investigate the general tendency and movement of mortality rate in Uganda from 1960-2015 that is to find out whether mortality rate has been increasing or decreasing over time. I also carried out regression of mortality rate with respect to time while considering time as the independent variable.

Figure 3: A TIME SERIES PLOT SHOWING THE TREND OF MORTALITY RATE IN UGANDA (1960-2015)



SOURCE: INDEX MUNDI (2015)

From the MINTAB output in the figure above, mortality rate has been taking a cyclical pattern from 1960 up to 1990 for which it was highest in 1960. From 1991, it observed a steady decline until when it was lowest in 2015. This is attributed to the improvement in health services delivery and improved standards of living.

LINEAR REGRESSION OF FERTILITY RATE OVER TIME IN UGANDA (1960-2015)

A linear regression between mortality rate over time was carried out using STATA to find out linear relationship between the two variables. During this regression, time (Years) was taken to be the independent variable and mortality rate as the dependent variable. The regression model obtained was of the form;

$\mathbf{MR = b_0 + b_1X + U_i}$

Where

MR = Mortality rate, **X** = Time, **b0** = Constsnt, **b1** = coefficient of time and **Ui** = Error term

Table 3: LINEAR REGRESSION OF MORTALITY RATE OVER TIME IN UGANDA (1960-2015)

```
. reg mort years

      Source |       SS       df       MS              Number of obs =      56
-------------+------------------------------           F(  1,    54) =  189.90
       Model |  1088.15181     1  1088.15181           Prob > F      =  0.0000
    Residual |  309.428458    54  5.73015663           R-squared     =  0.7786
-------------+------------------------------           Adj R-squared =  0.7745
       Total |  1397.58026    55  25.4105503           Root MSE      =  2.3938

------------------------------------------------------------------------------
        mort |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       years |  -.2727235   .0197907   -13.78   0.000    -.3124015   -.2330456
       _cons |   558.6074   39.33531    14.20   0.000     479.7449      637.47
------------------------------------------------------------------------------
```

SOURCE: INDEX MUNDI (2015)

From the table above, the model can be given as

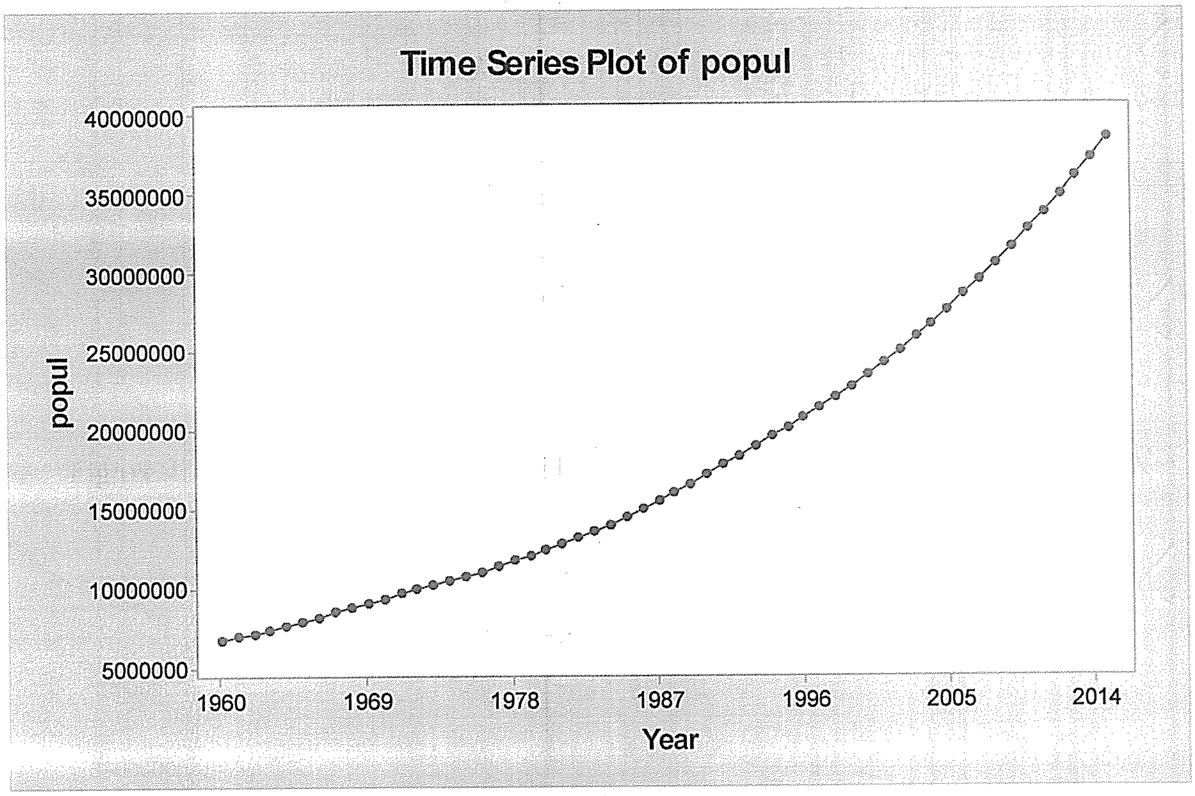
MR = 558.6074 – 0.2727235X + U_i

The linear regression results from the table above indicates that time has a significant effect on mortality rate since F=189.90 and P-value (0.000) is less than 0.05. Basing on **R^2 (0.7786)**, it means that time explains 77.86% variations in mortality rate. The constant **b_0 = 558.6074,** means that without time, there will be a fertility rate of **558.6074.** The coefficient **b_1** = – **0.2727235** means that if the dependent variable (time) increases by one unit, there will be a decrease in fertility rate of **0.2727235**

4.3 THE TREND OF POPULATION GROWTH IN UGANDA

To fulfill this objective, time series plot was plotted using MINTAB so as to investigate the general tendency and movement of population growth in Uganda from 1960-2015 that is to find out whether population growth has been increasing or decreasing over time. I also carried out regression of population growth with respect to time while considering time as the independent variable.

Figure 4: A TIME SERIES PLOT SHOWING THE TREND OF POPULATION GROWTH IN UGANDA (1960-2015)



SOURCE: United Nations (2015)

From the MINTAB results in the figure above, population growth has been taking a steady increase year by year.

LINEAR REGRESSION OF POPULATION GROWTH OVER TIME IN UGANDA (1960-2015)

A linear regression between mortality rate over time was carried out using STATA to find out linear relationship between the two variables. During this regression, time (Years) was taken to be the independent variable and population growth as the dependent variable. The regression model obtained was of the form;

$$\mathbf{PG = b_0 + b_1X + U_i}$$

Where

PG = Population growth, **X** = Time, **b0** = Constsnt, **b1** = coefficient of time and **Ui** = Error term

Table 4: LINEAR REGRESSION OF POPULATION GROWTH OVER TIME IN UGANDA (1960-2015)

```
. reg popul years

      Source |       SS       df       MS              Number of obs =      56
-------------+------------------------------           F(  1,    54) =  915.22
       Model |  4.3452e+15     1  4.3452e+15           Prob > F      =  0.0000
    Residual |  2.5638e+14    54  4.7478e+12           R-squared     =  0.9443
-------------+------------------------------           Adj R-squared =  0.9433
       Total |  4.6016e+15    55  8.3666e+13           Root MSE      =  2.2e+06

------------------------------------------------------------------------------
       popul |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       years |   544985.4   18014.51    30.25   0.000     508868.5    581102.3
       _cons |  -1.07e+09   3.58e+07   -29.75   0.000    -1.14e+09   -9.93e+08
------------------------------------------------------------------------------
```

SOURCE: United Nations (2015)

From the table above, the model is given as

PG = -0.0000000107 + 544985.4X + U_i

The linear regression results from the table above indicates that time has a significant effect on mortality rate since F=915.22 and P-value (0.000) is less than 0.05. Basing on R^2 **(0.9443)**, it means that time explains 94.43% variations in population growth. The constant b_0 = **-0.0000000107,** means that without time, there will be a population growth of - **0.0000000107.** The coefficient b_1 = **544985.4** means that if the dependent variable (time) increases by one unit, there will be an increase in population growth of **544985.4.**

4.4.1 TESTING FOR STATIONARITY OF THE VARIABLES

According to Maddala (1977), non-stationary time series are usually made stationary before analysis in order to avoid spurious regression results. Stationarity was tested using STATA under the Dickey-Fuller test for unit root at 5% critical value and the test statistic was compared with the critical value.

Table 5: Dickey Fuller unit root test for population growth

```
. dfuller population

Dickey-Fuller test for unit root                   Number of obs   =        55
```

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
		Interpolated Dickey-Fuller		
Z(t)	77.769	-3.573	-2.926	-2.598

```
MacKinnon approximate p-value for Z(t) = 1.0000
```

SOURCE: United Nations (2015)

From the table above, it is evident that the computed statistic Z(t)=77.769 is greater than all the critical value at both 1%, 5% and 10% but the research was conducted at 5% significance level therefore, the null was accepted and concluded that the data for population growth was stationary.

Table 6 : Dickey Fuller unit root test for fertility rate

```
. dfuller fertility

Dickey-Fuller test for unit root                   Number of obs   =        55
```

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	16.312	-3.573	-2.926	-2.598

MacKinnon approximate p-value for Z(t) = 1.0000

SOURCE: *The world bank (2015) Data.worldbank.org*

From the table above, it is evident that the computed statistic Z(t)=16.312 is greater than all the critical value at both 1%, 5% and 10% but the research was conducted at 5% significance level therefore, the null was accepted and concluded that the data for fertility rate was stationary.

Table 7: Dickey Fuller unit root test for mortality rate

```
. dfuller mortality

Dickey-Fuller test for unit root                   Number of obs   =        55
```

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	4.019	-3.573	-2.926	-2.598

MacKinnon approximate p-value for Z(t) = 1.0000

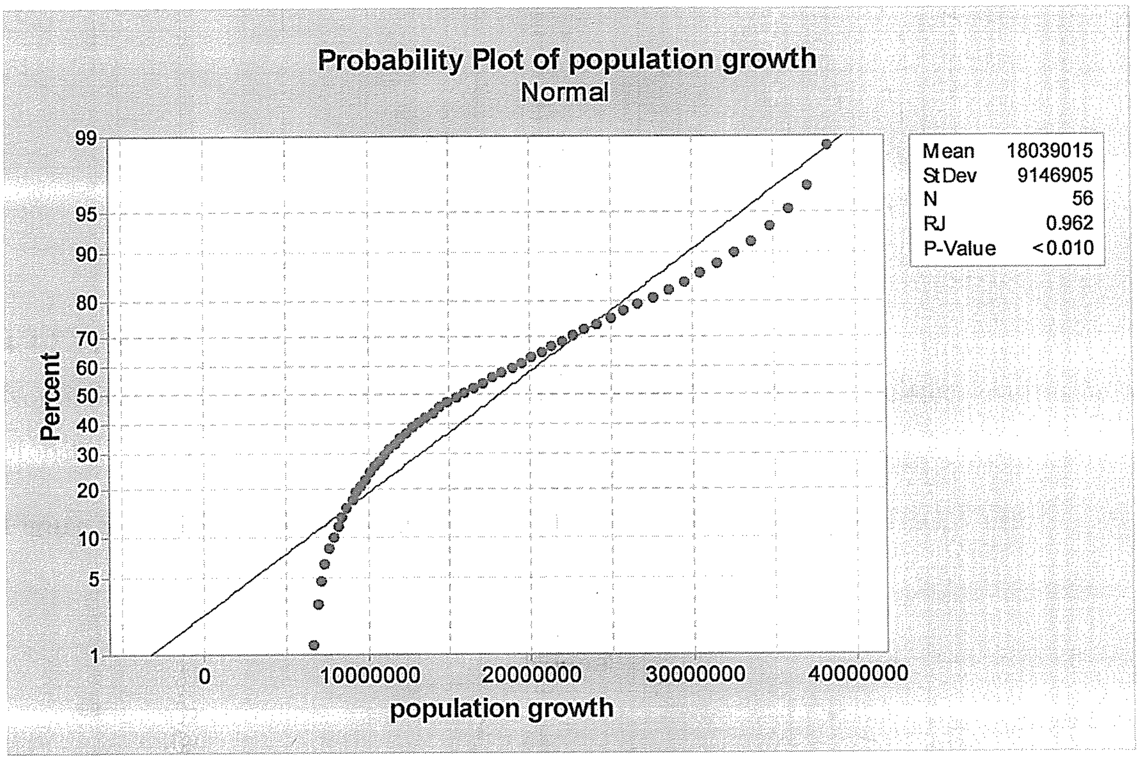
SOURCE: INDEX MUNDI (2015)

From the table above, it is evident that the computed statistic Z(t)=4.019 is greater than all the critical value at both 1%, 5% and 10% but the research was conducted at 5% significance level therefore, the null was accepted and concluded that the data for mortality rate was stationary.

4.4.2 TESTING FOR NORMALITY OF THE DATA

Normality of the data was tested using **MINITAB17** at 5% significance level using normal probability plots

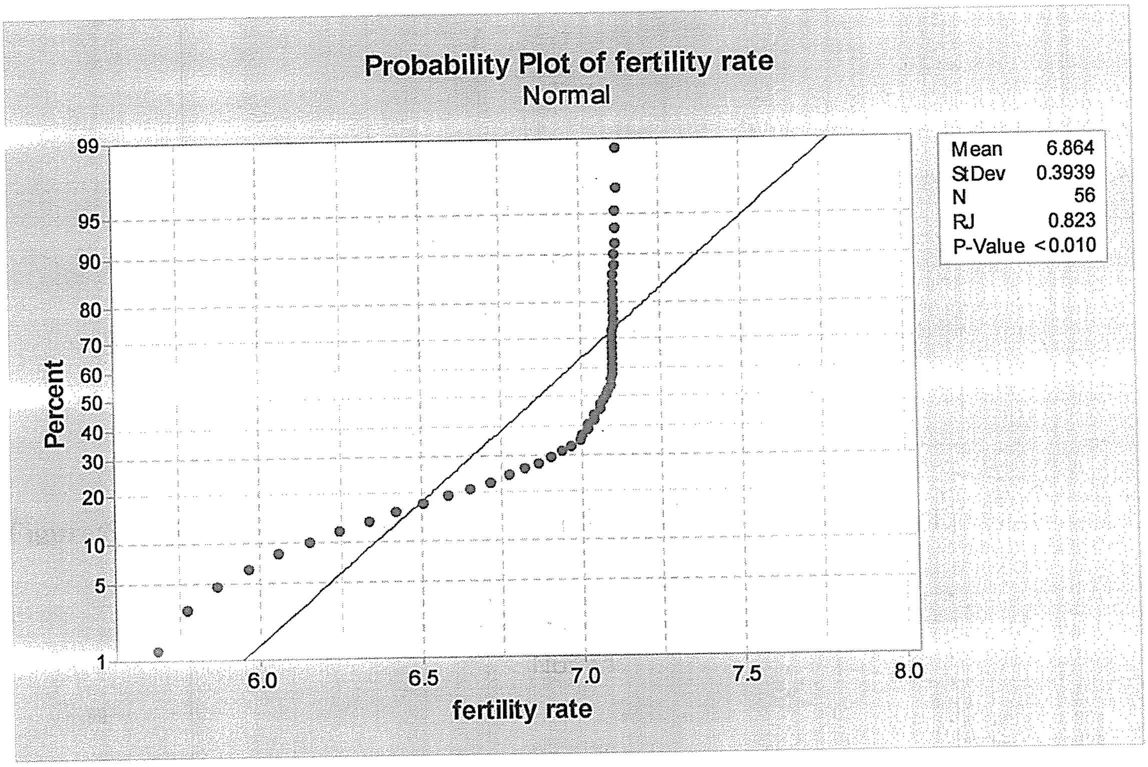
Figure 5: NORMAL PROBABILITY PLOT OF POPULATION GROWTH



SOURCE: United Nations (2015)

From the graph above, all the points lie near the curve and the Ryan Joiner value (RJ) =0.962 is close to 1, then the data is normally distributed

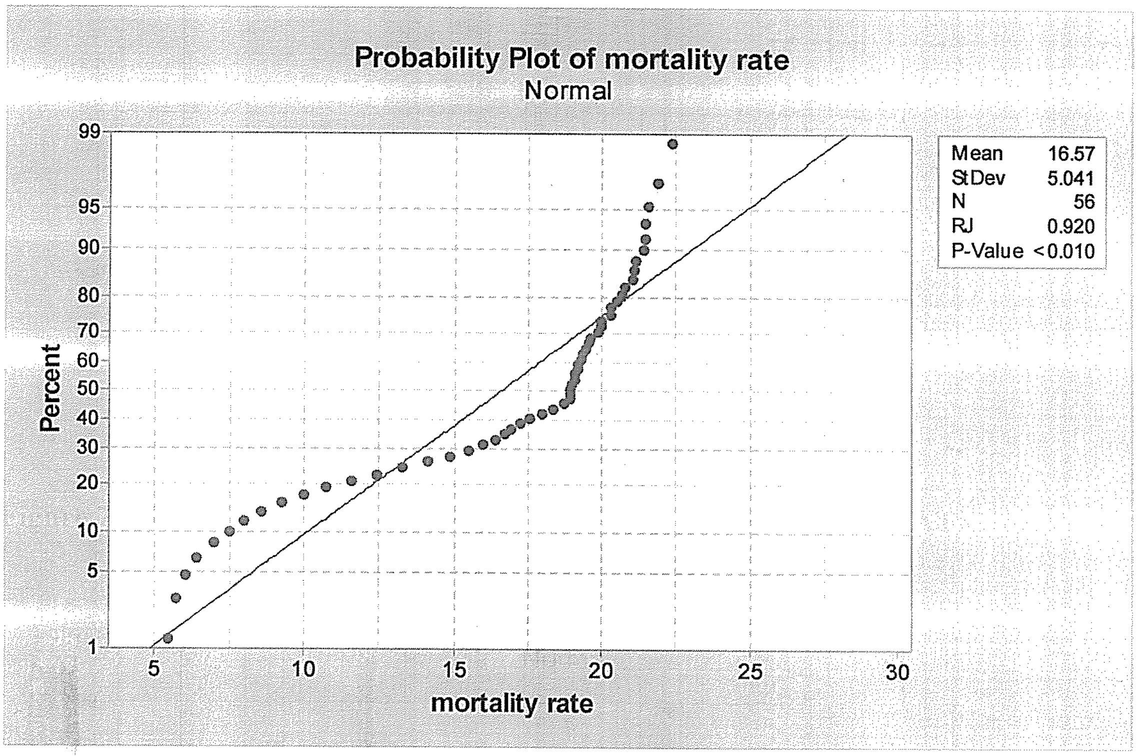
Figure 6: NORMAL PROBABILITY PLOT FOR FERTILITY RATE



SOURCE: ***The world bank (2015) Data.worldbank.org***

From the graph above, all the points lie near the curve and the Ryan Joiner value (RJ) =0.823 is close to 1, then the data is normally distributed

Figure 7: NORMAL PROBABILITY PLOT FOR MORTALITY RATE



SOURCE: INDEX MUNDI (2015)

From the graph above, all the points lie near the curve and the Ryan Joiner value (RJ) =0.920 is close to 1, then the data is normally distributed

4.5 THE EFFECT OF FERTILITY RATE ON POPULATION GROWTH

To fulfill this objective, linear regression of fertility rate and population growth was carried out using STATA at 0.05 level of significance. And also, correlation analysis of population growth with fertility rate was also carried out using SPSS.

Table 8: LINEAR REGRESSION OF FERTILITY RATE AND POPULATION GROWTH IN UGANDA (1960-2015)

```
. reg popul fert

      Source |       SS       df       MS              Number of obs =      56
-------------+------------------------------           F(  1,    54) =  218.83
       Model |  3.6908e+15     1  3.6908e+15           Prob > F      =  0.0000
    Residual |  9.1079e+14    54  1.6866e+13           R-squared     =  0.8021
-------------+------------------------------           Adj R-squared =  0.7984
       Total |  4.6016e+15    55  8.3666e+13           Root MSE      =  4.1e+06

------------------------------------------------------------------------------
       popul |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fert |  -2.08e+07    1405946   -14.79   0.000    -2.36e+07   -1.80e+07
       _cons |   1.61e+08    9665805    16.64   0.000     1.41e+08    1.80e+08
------------------------------------------------------------------------------
```

SOURCE: United Nations (2015), World Population Prospects

From the table above, basing on the results of regression analysis, the model will be:

Population growth = 161000000– 20800000 fertility rate.

From the above results, basing on the R^2 value of 0.802, it means that fertility rate explains 80.2% variation in population growth but basing on the coefficient of fertility rate (- 20800000), it implies that fertility rate and population growth are inversely related meaning that increase in fertility rate leads to a decrease in population growth. Basing on the F=218.83 and P-value (0.000), it is evident that the P-value is less than 0.05, implying that the relationship between population growth and fertility rate is significant at 0.05% level of significance.

Table 9: CORRELATION OF POPULATION GROWTH WITH FERTILITY RATE

		POULATION	FERTILITY
POULATION	Pearson Correlation	1	-.896
	Sig. (2-tailed)		.000
	N	56	56
FERTILITY	Pearson Correlation	-.896	1
	Sig. (2-tailed)	.000	
	N	56	56

SOURCE: United Nations (2015), World Population Prospects

From the results of the correlation analysis, r = -0.896 meaning that there is a strong negative relationship between population growth and fertility rate in Uganda from 1960-2015

4.6 THE EFFECT OF MORTALITY RATE ON POPULATION GROWTH

To fulfill this objective, linear regression of mortality rate and population growth was carried out using STATA at 0.05 level of significance. And also, correlation analysis of population growth with mortality rate was also carried out using SPSS.

Table 10: LINEAR REGRESSION OF MORTALITY RATE AND POPULATION GROWTH IN UGANDA (1960-2015)

```
. reg popul mort

      Source |       SS       df       MS              Number of obs =      56
-------------+------------------------------           F(  1,    54) =  638.34
       Model |  4.2427e+15     1  4.2427e+15           Prob > F      =  0.0000
    Residual |  3.5891e+14    54  6.6464e+12           R-squared     =  0.9220
-------------+------------------------------           Adj R-squared =  0.9206
       Total |  4.6016e+15    55  8.3666e+13           Root MSE      =  2.6e+06

------------------------------------------------------------------------------
       popul |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        mort |   -1742342   68961.45   -25.27   0.000     -1880602    -1604083
       _cons |   4.69e+07    1193459    39.30   0.000     4.45e+07    4.93e+07
------------------------------------------------------------------------------
```

SOURCE: United Nations (2015), World Population Prospects

From the table above, basing on the results of regression analysis, the model will be:

Population growth = 46700000 – 1742342 mortality rate.

From the above results, basing on the R^2 value of 0.92, it means that mortality rate explains 92% variation in population growth but basing on the coefficient of mortality rate (- 1742342), it implies that mortality rate and population growth are inversely related meaning that increase in mortality rate leads to a decrease in population growth. Basing on the F = 638.34 and the P-value (0.000), it is evident that the P-value is less than 0.05 meaning that the model is significant. Hence there exists a significant relationship between population growth and mortality rate in Uganda at 0.05 level of significance.

Table 11: CORRELATION OF POPULATION GROWTH WITH FERTILITY RATE

		POULATION	MORTALITY
POULATION	Pearson Correlation	1	-.960
	Sig. (2-tailed)		.000
	N	56	56
MORTALITY	Pearson Correlation	-.960	1
	Sig. (2-tailed)	.000	
	N	56	56

SOURCE: United Nations (2015), World Population Prospects

From the results of the correlation analysis, r = -0.96 meaning that there is a strong negative relationship between population growth and mortality rate in Uganda.

4.7 THE EFFECT OF MORTALITY RATE ON FERTILITY RATE

To achieve this objective, linear regression of mortality rate and fertility rate was carried out using STATA at 0.05 level of significance. And also, correlation analysis of fertility rate with mortality rate was also carried out using SPSS.

Table 12: LINEAR REGRESSION OF MORTALITY RATE AND FERTILITY RATE

```
. reg fert mort

      Source |       SS       df       MS              Number of obs =      56
-------------+------------------------------           F(  1,    54) =  456.82
       Model |  7.6306883     1   7.6306883            Prob > F      =  0.0000
    Residual |  .902007982    54  .016703852           R-squared     =  0.8943
-------------+------------------------------           Adj R-squared =  0.8923
       Total |  8.53269629    55  .155139932           Root MSE      =  .12924

------------------------------------------------------------------------------
        fert |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        mort |   .0738913   .0034572    21.37   0.000     .0669601    .0808225
       _cons |   5.639517   .0598303    94.26   0.000     5.519565     5.75947
------------------------------------------------------------------------------
```

SOURCE: United Nations (2015), World Population Prospects

From the table above, basing on the results of regression analysis, the model will be:

Fertility rate = 5.639517 + 0.0738913 mortality rate.

From the above results, basing on the R^2 value of 0.8943, it means that mortality rate explains 89.43% variation in fertility rate but basing on the coefficient of mortality rate (0.0738913), it implies that mortality rate and fertility rate are directly or positively related meaning that increase in mortality rate leads to an increase in fertility rate. Basing on the F = 456.82 and the P-value (0.000), it is evident that the P-value is less than 0.05 meaning that the model is significant. Hence there exists a significant relationship between fertility rate and mortality rate in Uganda at 0.05 level of significance.

Table 13: CORRELATION BETWEEN FERTILITY RATE AND MORTALITY RATE

		FERTILITY	MORTALITY
FERTILITY	Pearson Correlation	1	.946
	Sig. (2-tailed)		.000
	N	56	56
MORTALITY	Pearson Correlation	.946	1
	Sig. (2-tailed)	.000	
	N	56	56

Correlation is significant at the 0.05 level (2-tailed).
SOURCE: United Nations (2015), World Population Prospects

From the results of the correlation analysis, r = 0.946 meaning that there is a strong positive relationship between fertility rate and mortality rate in Uganda

4.8.0 THE EFFECT OF MORTALITY RATE, FERTILITY RATE ON POPULATION GROWTH IN UGANDA FROM 1960-2015

To fulfill this objective, I regressed mortality rate and fertility rate on population growth using STATA at 5% significance level. However some tests for multicollinearity had to be done before achieving this research purpose

4.8.1 TESTING FOR MULTICOLLINEARITY OF THE INDEPENDENT VARIABLES

This is carried out to investigate whether the two independent variables are highly correlated. This was tested using SPSS at 5% significance level which involved regression of the DV with the two IVs

Table 14: MULTICOLLINEAR TEST FOR THE INDEPENDENT VARIABLES

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	232446.212	161780.722		1.437	.157		
	Fertility rate	-37007.340	28632.791	-.532	-1.292	.202	.106	9.395
	Mortality rate	3423.601	2247.983	.626	1.523	.134	.106	9.395

a. Dependent Variable: population growth

SOURCE: United Nations (2015), World Population Prospects

According to the VIF value of 9.395, it is evident that this value is greater than 5, thus the two independent variables are highly correlated meaning that there is multicollinearity between them. This means that the two IVs almost have the same effect on the DV.

Because of this effect, I had to choose the IV which had a greater impact on the DV and this was done by regressing the IVs independently with the DV. The best model was chosen by comparing the R^2 and the standard errors of the two regressions.

With reference to the regressions in **Table 8** and **Table 10,** by comparing the R^2 and the standard errors of the two regressions, it is evident that the regression of population growth and mortality rate has a high R^2 (0.922) and least standard error meaning that mortality rate is more significant in determining population growth in Uganda than fertility rate. Meaning that the model will be;

Population growth = 46700000 – 1742342 mortality rate.

4.7.4 THE EFFECT OF MORTALITY RATE, FERTILITY RATE ON POPULATION GROWTH IN UGANDA (1960-2015)

To fulfill this general purpose of the study, both correlation and regression of the three variables of my study was carried out at 0.05 significance level. A correlational matrix of the three variables was obtained using SPSS so as to find out how the three variables were related to one another. Also multiple regression of the variables was carried out using STATA and a three variable model was obtained so as to find the magnitude of the independent variables on the dependent variables.

Table 15: CORRELATION BETWEEN FERTILITY RATE, MORTALITY RATE AND POPULATION GROWTH IN UGANDA (1960-2015)

Control Variables			POULATION	FERTILITY	MORTALITY
YEARS	POULATION	Correlation	1.000	-.976	-.925
		Significance (2-tailed)	.	.000	.000
		Df	0	53	53
	FERTILITY	Correlation	-.976	1.000	.886
		Significance (2-tailed)	.000	.	.000
		Df	53	0	53
	MORTALITY	Correlation	-.925	.886	1.000
		Significance (2-tailed)	.000	.000	.
		Df	53	53	0

SOURCE: United Nations (2015), World Population Prospects

From the table above, the partial correlations of the variables were obtained. Hence population growth and fertility rate has a coefficient of correlation of **r = -0.976,** meaning that there exists a strong negative relationship between population growth and fertility rate in Uganda. Population growth and mortality rate had a coefficient of correlation of **r = - 0.925,** meaning that there exists a strong negative relationship between population growth and mortality rate in Uganda from 1960-2015. Fertility rate and mortality rate had a coefficient of correlation **r = 0.886,** meaning that there exists a strong positive relationship between mortality rate and fertility rate in Uganda.

Table 16: MULTIPLE REGRESSION OF FERTILITY RATE, MORTALITY RATE AND POPULATION GROWTH

```
. reg popul fert mort

      Source |       SS       df       MS              Number of obs =      56
-------------+------------------------------           F(  2,    53) =  319.78
       Model |  4.2495e+15     2  2.1247e+15           Prob > F      =  0.0000
    Residual |  3.5216e+14    53  6.6444e+12           R-squared     =  0.9235
-------------+------------------------------           Adj R-squared =  0.9206
       Total |  4.6016e+15    55  8.3666e+13           Root MSE      =  2.6e+06

------------------------------------------------------------------------------
       popul |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        fert |    2736174    2714088     1.01   0.318     -2707597     8179944
        mort |   -1944522   212069.7    -9.17   0.000     -2369880    -1519164
       _cons |   3.15e+07   1.54e+07     2.05   0.045     684602.7    6.23e+07
------------------------------------------------------------------------------
```

SOURCE: United Nations (2015), World Population Prospects

Model specification

Population growth =31500000 + 2736174 Fertility Rate -1944522 Mortality Rate

The model is of the form, $Y = \beta_0 + \beta_1X_1 - \beta_2X_2$

Interpretation of the model

β_0 = 31500000, mean that without fertility rate and mortality rate, there will be a population growth of 31500000 people.

β_1 = 2736174, is the regression coefficient of X_1, meaning that holding X_2 constant, there will be a population growth of 2736174 people.

β_2 = -1944522, is the regression coefficient of X_2, meaning that holding X_1 constant, there will be a population growth of 1944522 but in an inverse direction.

Interpretation of the overall output

$R^2 = 0.9235$ means that the two IVs explain 92.35% variation in the DV meaning that 7.65% variation in the DV is explained by other variables such as emigration, immigration, Literacy levels and life expectance.

Adjusted $R^2 = 0.9206$ means that any addition of the IV improves the model by 92.06%.

Fc = 319.78 means

Interpretation of the p-value

The p-value for mortality, (0.000) means that mortality rate is significant since it is less than the p-value of 0.05 and the p-value for fertility rate (0.318) means that fertility rate is insignificant in the model.

4.8 INVESTIGATION OF THE SIGNIFICANCY OF THE STUDY HYPOTHESES

In line with hypothesis one, that is;

Null hypothesis: There is no significant relationship between population growth and fertility rate

Research hypothesis: There is a significant relationship between population growth and fertility rate

From the results of the regression between population growth and fertility rate in **table 8**, the p-value indicated a significant relationship between population growth and fertility rate.

Comparing the F-computed value (Fc = 218.53) with the F-critical value at $F_{0.05}\,(1,54)$ which is 4.03, the null was rejected since Fc>F-critical concluding that there is a significant relationship between population growth and fertility rate in Uganda.

In line with hypothesis two, that is:

Null hypothesis: There is no significant relationship between population growth and mortality rate

Research hypothesis: There is a significant relationship between population growth and mortality rate

From the results of the regression between population growth and mortality rate in **table 10**, the p-value indicated a significant relationship between population growth and mortality rate.

Comparing the F-computed value (Fc = 638.34) with the F-critical value at $F_{0.05}(1,54)$ which is 4.03, the null was rejected since Fc>F-critical concluding that there is a significant relationship between population growth and mortality rate in Uganda.

In line with hypothesis three,

Null hypothesis: there is no significant relationship between mortality rate and fertility rate

Research hypothesis: there is a significant relationship between mortality rate and fertility rate.

With reference to the results of regression from **table 12**, basing on the p-value (0.000), it shows that the model is significant.

Basing on the Fc value (456.82) and the F critical value of 4.03, since Fc > F critical, we reject the null and conclude at 0.05 significance level that there is a significant relationship between fertility rate and mortality rate in Uganda.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMENDATION

This chapter covers the discussion, summary, conclusion and recommendation

5.1 DISCUSSION

The study has also established that the trend of population growth in Uganda from 1960-2015 has shown a general and significant increase. Mortality rate has been found out to have a cyclical pattern for some year and started declining steadily and according to my research, this has been due to improvement in health services, improved living standards among others. The trend of fertility rate has been established to have a non linear pattern from 1960-1980s and then there has been a steady decrease up to 2015.

The effect of fertility rate on population growth

Population growth = 161000000– 20800000 fertility rate.

From the above model, without fertility rate, there will be a population of 161000000.

Basing on the R^2 value of 0.802 obtained from the regression, it means that fertility rate explains 80.2% variation in population growth but basing on the coefficient of fertility rate (-20800000), it implies that fertility rate and population growth are inversely related meaning that increase in one leads to a decrease in the other.

The effect of mortality rate on population growth

Population growth = 46700000 – 1742342 mortality rate. Meaning that without mortality rate, there will be a population of 46700000

From the above results, basing on the R^2 value of 0.92 obtained from regression, it means that mortality rate explains 92% variation in population growth but basing on the coefficient of mortality rate (- 1742342), it implies that mortality rate and population growth are inversely related meaning that increase in one leads to a decrease in the other.

The effect of mortality rate on fertility rate

Fertility rate = 5.639517 + 0.0738913 mortality rate. Meaning that without mortality rate, there will be a fertility rate figure of 5.639517%

Basing on the R^2 value of 0.8943 obtained from regression, it means that mortality rate explains 89.43% variation in fertility rate but basing on the coefficient of mortality rate (0.0738913), it implies that mortality rate and fertility rate are directly or positively related meaning that increase in one leads to an increase in the other.

The effect of mortality rate, fertility rate on population growth in Uganda

From the results of regression analysis, I found out that population growth in Uganda was related to mortality rate and fertility rate by the following equation

Population growth =31500000 + 2736174 Fertility Rate -1944522 Mortality Rate

Thus,

β_0 = 31500000, mean that without fertility rate and mortality rate, there will be a population growth of 31500000 people.

β_1 = 2736174, is the regression coefficient of X_1, meaning that holding X_2 constant, there will be a population growth of 2736174 people.

β_2 = -1944522, is the regression coefficient of X_2, meaning that holding X_1 constant, there will be a population growth of 1944522 but in an inverse direction.

However, from the preliminary tests, I found out that the two IVs were highly correlated thus choosing the best model was done by making independent regressions of the IVs with the DV and I found out that mortality rate was more significant in determining population growth because it had high R^2 and least standard error, thus the best model chosen was;

Population growth = 46900000 – 1742342 mortality rate

Meaning that without mortality rate, there will be a population growth of **46900000** people and a unit change in mortality rate leads to a decrease in population growth by **1742342** people

5.2 CONCLUSION

This study was aimed at finding the effect of mortality rate, fertility rate on population growth in Uganda and I found out that both fertility rate and mortality rate affects population growth negatively. However, mortality rate was more significant in determining population growth. Mortality rate and fertility rate were found to have a strong positive relationship meaning that an increase in mortality rate leads to an increase in fertility rate. The study has also established that the trend of population growth in Uganda from 1960-2015 has shown a general and significant increase. Mortality rate has been found out to have a cyclical pattern for some year and started declining steadily and according to my research, this has been due to improvement in health services, improved living standards among others. The trend of fertility rate has been established to have a non linear pattern from 1960-1980s and then there has been a steady decrease up to 2015. Basing on the research hypotheses,

In line with **Ho1:** There is no significant relationship between population growth and fertility rate

From the results of the regression between population growth and fertility rate in **table 8**, the p-value (0.000) indicated a significant relationship between population growth and fertility rate. Comparing the F-computed value (Fc = 218.53) with the F-critical value at $F_{0.05}$ (1,54) which is 4.03, the null was rejected since Fc>F-critical concluding that there is a significant relationship between population growth and fertility rate in Uganda from **1960-2015**

In line with hypothesis two, that is:

In line with **Ho2:** There is no significant relationship between population growth and mortality rate.

From the results of the regression between population growth and fertility rate in **table 10**, the p-value (0.000) indicated a significant relationship between population growth and mortality rate. Comparing the F-computed value (Fc = 638.34) with the F-critical value at $F_{0.05}$ (1,54) which is 4.03, the null was rejected since Fc>F-critical concluding that there is a significant relationship between population growth and mortality rate in Uganda from **1960-2015.**

In line with **Ho3:** there is no significant relationship between mortality rate and fertility rate

From the output in **table 12**, basing on the p-value (0.000), it shows that the model is significant at 0.05 level of significance. Basing on the Fc value (456.82) and the F critical value of 4.03, since Fc > F critical, we reject the null and conclude at 0.05 significance level that there is a significant relationship between fertility rate and mortality rate in Uganda from **1960-2015**

5.3 RECOMMENDATION

Uganda's population growth is high yet unproductive therefore the government should equip the rapid growing population with skills through education and this can help to increase on the productive capacity of the population.

Government should also put much emphasis on family planning so as to reduce on the fertility rate of the women and this can be done through community mobilization and women education

More emphasis should be put on the health sector so as to reduce on mortality rate especially the infant mortality rate and also to increase on the life expectance all of which help to reduce the fertility rate and also the population growth rate

5.4 AREAS OF FURTHER STUDIES

I do recommend further researches on the following

- The effect of nutrition on the fertility rate in Uganda
- The effect of infant mortality rate on fertility rate in Uganda
- The relationship between female literacy and population growth in Uganda.

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APPENDIX 1

YEARS	POPULATION GROWTH	FERTILITY RATE	MORTALITY RATE
1960	6686657	6.999	22.38
1961	6897420	7.019	21.91
1962	7123392	7.04	21.49
1963	7363783	7.06	21.08
1964	7616796	7.078	20.7
1965	7880279	7.094	20.32
1966	8153562	7.106	19.98
1967	8436690	7.113	19.65
1968	8726749	7.117	19.34
1969	9017820	7.118	19.1
1970	9304399	7.115	18.95
1971	9583195	7.111	18.91
1972	9854343	7.107	18.99
1973	10122332	7.103	19.19
1974	10394985	7.105	19.49
1975	10680349	7.099	19.87
1976	10983422	7.099	20.32
1977	11305257	7.099	20.77
1978	11644346	7.099	21.18
1979	11997814	7.112	21.46
1980	12362716	7.099	21.56
1981	12737381	7.101	21.44
1982	13122578	7.101	21.04
1983	13522788	7.102	20.5
1984	13945321	7.103	19.98
1985	14397152	7.103	19.58
1986	14882415	7.103	19.32
1987	15401009	7.102	19.18

1988	15948028	7.112	19.09
1989	16515018	7.097	18.95
1990	17093314	7.091	18.71
1991	17678899	7.082	18.37
1992	18272478	7.071	17.96
1993	18874594	7.057	17.56
1994	19484463	7.039	17.22
1995	20102117	7.018	16.95
1996	20727218	6.994	16.69
1997	21360483	6.967	16.39
1998	22008155	6.937	15.99
1999	22681585	6.903	15.48
2000	23391997	6.865	14.84
2001	24146152	6.822	14.1
2002	24945231	6.772	13.28
2003	25786777	6.716	12.42
2004	26666251	6.653	11.56
2005	27578578	6.583	10.74
2006	28521669	6.507	9.97
2007	29496442	6.424	9.25
2008	30503193	6.337	8.59
2009	31540776	6.247	8.01
2010	32608271	6.154	7.52
2011	33704880	6.059	6.98
2012	34830481	5.964	6.41
2013	35987004	5.869	6.03
2014	37178179	5.775	5.69
2015	38407677	5.682	5.46

SOURCE: United Nations (2015), World Population Prospects

PERSONAL STATEMENT

Highly organized and efficient person, with a thorough and precise approach to projects, which has produced excellent results to date, able to manage own time effectively and prioritise workload. Experienced at working to tight deadlines and under considerable pressure. Friendly and approachable with excellent interpersonal and customer relations skills.

KEY SKILLS

- Regular user of Microsoft Office, including Excel, Word, Power point.
- Ability to manage time and prioritize workload to ensure efficient delivery of all aspects of tasks
- Excellent communication skills, both written and verbal
- Ability to use statistical packages such as SPSS, STATA, MINTAB and Epi-Data

WORKING EXPERIENCE

2017-Date	NIRA Enrollment officer Kaliro District.
2016-2017	Serving as a sports minister KIU Abasoga Nseete
2015-2016	Served as a cultural minister KIU Abasoga Nseete
2014	Teacher at Dr. Forer Memorial College Kaliro
2014	Enumerator in the National Population and Housing Census

LANGUAGES SPOKEN

Lusoga, Luganda and Engilish

REFEREES	POSITION	CONTACT
KUNGU DENIS	Physical planner Nakaseke district	0701807858/0777316153
NAMUSISI MOREEN	President KIU Nseete 2016-2017	0755887215/0789353481
MWEBESA EDSON	Lecturer at KIU	0703317188

DECLARATION

I declare that the information provided above is the truth about me

.... 11/07/2017 ....

MWESIGWA ALAFA