WATER AND SANITATION PROJECTS AND PEOPLES’ WELFARE IN NGOMA DISTRICT, RWANDA

BY

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October, 2017
DECLARATION

I declare that this dissertation is my original work and has not been submitted for any other
award of a degree or published at any institution of higher learning.

……………………………………………                 …………/…………/………………
Signed                          Date
Mudahemuka William
APPROVAL

This dissertation has been submitted for further examination by internal and external examiners and university members of research defence panel with my approval as university supervisor.

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Date
DEDICATION

I dedicate this piece of work to my parents and close friends who supported me throughout the course of this study.
ACKNOWLEDGEMENT

I express my deepest gratitude to my Father Almighty God in heaven whose grace and mercy, I could not have come this far in life.

To my supervisor, I owe you a special debt of thanks for excellent support and guidance that enabled me to produce this work on time.

I cannot forget my exemplary lecturers at the College of Humanities and Social Sciences for their great assistance and excellent academic pieces of advice. I owe a special debt of gratitude to all of them.

I acknowledge the authors whose works have been cited in this study.

I acknowledge with gratitude the contributions and co-operation made by the residents of Ngoma District for their willingness to provide the necessary information when I visited them during the research process. Without their cooperation, this study would have been impossible to accomplish.

Finally, I also thank my parents and close friends for both their emotional and financial support. It is through them that I successfully completed this piece of work.
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<th>Description</th>
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<td>AFDB</td>
<td>African Development Bank</td>
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<tr>
<td>AMCOW</td>
<td>African Ministers’ Council on Water</td>
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<td>CATS</td>
<td>Community Approach to Total Sanitation</td>
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<td>CDC</td>
<td>Center for Diseases Control and Prevention</td>
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<td>EICV</td>
<td>Enquête Integrale sur les Conditions de Vie des Ménages</td>
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<td>EWSA</td>
<td>Energy, Water, and Sanitation Authority</td>
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<td>GLAAS</td>
<td>Global Analysis and Assessment of Sanitation ad Drinking Water</td>
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<td>HHs</td>
<td>Households</td>
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<tr>
<td>IDWSSD</td>
<td>International Drinking Water Supply and Sanitation Decade</td>
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<td>JICA</td>
<td>Japanese International Corporation Agency</td>
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<td>MINIFRA</td>
<td>Ministry of Infrastructure</td>
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<td>NGO</td>
<td>Nongovernmental Organizations</td>
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<td>OECD</td>
<td>Organizations of Economics and Cultural Development</td>
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<td>RWSSI</td>
<td>Rural Water Supply and Sanitation Interventions</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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<tr>
<td>ToC</td>
<td>Theory of Change</td>
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<td>TOC</td>
<td>Theory of Constraints</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNDP</td>
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<td>UNICEF</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>WS&amp;S</td>
<td>Water Supply and Sanitation</td>
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<td>WSP</td>
<td>Water Safety Plan</td>
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ABSTRACT

The purpose of this study was to assess the effect of water and sanitation projects on peoples’ welfare in Ngoma District, Rwanda. The study was guided by the following research objectives: i) to assess the performance of water and sanitation projects in Ngoma District; ii) to assess the welfare of the people of Ngoma District, and iii) to establish the effect of water and sanitation projects on people’s welfare in Ngoma District. This study employed cross-sectional survey design. The target population was 336,928 and the sample size computed using Solven’s formula was 400, the actual returned questionnaires was 302. The main data collection tools were questionnaires and interviews. Data was analyse using frequency and percentage tables, and Pearson Correlation and Regression. The study found that majority, 28.2% of the respondents agreed that the performance of water and sanitation projects in Ngoma District was fairly satisfactory (overall average mean=3.04, Std=1.285). Furthermore, the study found that majority (43.2%) of the respondents agreed that people’s welfare was satisfactory (overall average mean=3.70, Std=1.149). In addition, the study found a significant effect of water and sanitation projects on people’s welfare by 0.8% (R²=0.008, p<0.01). The study concluded that water and sanitation projects have a weak effect on people’s welfare. The study made the following recommendations: the need for the government with the help of the local leaders to identify the most affected villages and construct protected springs and boreholes for them so that they can access safe, clean and cheap water within a few minutes from their homes; the need for the government, NGOs and well-wishers to educate the masses about the importance of treating or boiling water before it can be used; the need to educate the local masses about the importance of having latrines and rubbish bins in their homes so as to make sure every family promotes good hygiene and sanitation; and the need for the NGOs and the district leaders to carry out research into appropriate and cheap technologies, aiming at a large-scale transition from traditional to hygienic latrines at affordable cost to households.
CHAPTER ONE
INTRODUCTION

1.0 Introduction
This chapter covers the background of the study, statement of the problem, purpose of the study, objectives and research questions, scope of the study, and significance of the study.

1.1 Background of the Study
This section of the chapter captures the historical, theoretical, conceptual, and contextual perspectives.

1.1.1 Historical Perspective
Water supply and sanitation rose up the development agenda more than 20 years ago. The 1977 UN Water Conference in Mar del Plata, Argentina, recommended that the 1980s should be proclaimed “the International Drinking Water Supply and Sanitation Decade (IDWSSD)”. In preparation for the launch of the Decade, the World Bank and the World Health Organization (WHO) carried out rapid assessments of the Water Supply and Sanitation (WS&S) sectors in more than 100 developing countries (Bendahmane, 2013). These, together with WHO’s five-yearly monitoring of WS&S coverage, provided the baseline statistics against which progress in the sector is generally measured. The picture was a depressing one: 1.2 billion people out of a total Third World population of 2.2 billion (China was not included in the statistics at that time) were without access to safe drinking water; 1.7 billion had no proper means of excreta disposal. As a result, an estimated 10 million people a year were dying from diseases directly related to poor sanitation and half of the world’s hospital beds were occupied by patients suffering from water-related illnesses (Dangerfield, 2012).

Every year, millions of the world’s poorest people die from preventable diseases caused by inadequate water supply and sanitation (WS&S) services (Davis, et al., 2013). Hundreds of millions more suffer from regular bouts of diarrhoea or parasitic worm infections that ruin their lives. Women and children are the main victims. Burdened by the need to carry water containers long distances every day, they must also endure the indignity, shame, and sickness that result from a lack of hygienic sanitation (Okun, 2014). The impact of deficient water and sanitation services falls primarily on the poor. Unreached by public services, people in rural and peri-urban areas of developing countries make their own inadequate arrangements or pay excessively high prices to water vendors for meagre water supplies. Their poverty is
aggravated and their productivity impaired, while their sickness puts severe strains on health services and hospitals (Okun, 2014).

Apart from the overwhelming social arguments, there are also powerful economic and environmental reasons for improving WS&S services for the poor. Human waste is a major polluter of rivers and groundwater resources. As water demand rises inexorably with social and economic progress, scarcity of water becomes a major consideration in development planning. Industrialization and food security may both be threatened, unless water resources are protected and conserved (OECD, 2012).

In Africa, a report by RWSSI (2013) showed a steady increase in the provision of access to Water Supply and Sanitation in the Region. In 2013, a reported additional 23.6 million and 13.3 million people gained access to water supply and sanitation, respectively in 24 of the countries with African Development Bank (AfDB) rural water supply and sanitation interventions (RWSSI, 2013). This represents respective increases of about 40% for water supply and 30% for sanitation over 2012, and brought the number of additional people served with access to water supply and sanitation by the end of December 2013 to about 827 million and 57.6 million, respectively. Furthermore, a report by RWSSI (2013) revealed that in 2013 twelve countries (Chad, Ethiopia, Kenya, Madagascar, Malawi, Mali, Mozambique, Rwanda, Senegal, Tanzania, Uganda and Zambia) reported an increase in the number of people served with water supply and sanitation. Ethiopia accounted for 75% of the reported increases. The number of people provided with access to sanitation during the reporting period was lower than that of water supply by 3 million, indicating the need for concerted sanitation interventions in order to achieve satisfactory improvements (RWSSI, 2013).

Rwanda has made good progress in extending water supply and sanitation coverage during the past few years, under clear political commitment to three complementary sets of targets: the Economic Development and Poverty Reduction Strategy (2012), Millennium Development Goals (2015), and Vision 2020 (African Ministers’ Council on Water (AMCOW), 2015). The institutional framework has been reinforced by the recently updated National Policy and Strategy for Water and Sanitation Services (2010), addressing all four subsectors. The Ministry of Infrastructure leads coordination of stakeholders in the water supply subsectors, sharing this role with the Health Ministry in the case of sanitation. There are nonetheless outstanding challenges, regarding planning and budgeting, monitoring and
evaluation, as well as capacity building at lower levels of government following decentralization (AMCOW, 2015).

Rwanda is closing the gap on its targets, but is unlikely to attain the required coverage levels by 2018 without an increase in financing. The coverage trend over the past 10 years for rural water supply demonstrates the country’s capacity for developing new projects; while for sanitation the enabling environment and capacity for service development will need to be strengthened further in the medium term. After several years spent on fundamental sector reforms, implementation in the urban subsectors requires attention. For the newly launched public utility, Energy, Water, and Sanitation Authority (EWSA), the main planning and budgeting challenge will be to stay ahead of rapid urban growth (AMCOW, 2015).

To meet the national targets for 2018 would require an additional 425,000 people to gain access to improved water supply, and nearly half-a-million to gain access to improved sanitation, each year. Comparing estimates of required capital investment with what is anticipated to be available from government, donors, and households, there is an annual financing gap of at least US$27 million per year. Households’ capacity for sharing the costs of water supply capital investments is limited, and the strategy views their main contribution as being towards operations and maintenance costs, through water fees and tariffs (AMCOW, 2015). This study was an attempt to evaluate the impact of water supply and sanitation projects on people’s welfare in Rwanda and more specifically in Ngoma District.

1.1.2 Theoretical Perspective

This study was guided by two theories: Theory of Change (ToC) and Theory of Constraints (TOC).

This study was premised on the Theory of Change (ToC) by Brest (2010). Theory of Change explains the process of change by outlining causal linkages in an initiative, i.e., its shorter-term, intermediate, and longer-term outcomes. The identified changes are mapped –as the “outcomes pathway”– showing each outcome in logical relationship to all the others, as well as chronological flow. The links between outcomes are explained by “rationales” or statements of why one outcome is thought to be a prerequisite for another (Clark and Taplin, 2012).
The innovation of Theory of Change lies in: (1) making the distinction between desired and actual outcomes, and (2) requiring stakeholders to model their desired outcomes before they decide on forms of intervention to achieve those outcomes. A common error in describing Theory of Change is the belief that it is simply a methodology for planning and evaluation (Taplin, et al., 2013). Theory of Change is instead a form of critical theory that ensures a transparent distribution of power dynamics. Further, the process is necessarily inclusive of many perspectives and participants in achieving solutions.

The theory of change is related to this study in a way that when government brings in new initiative such as water supply and sanitation projects, the welfare of the local people will change since they will be able to receive safe, clean and cheap water supply. Similarly, availability of affordable clean water will help the people to practice good sanitation initiatives hence drastically changing their life style and overall wellbeing.

**Theory of Constraints (TOC)**

Furthermore, the study used the Theory of Constraints (TOC) developed (Goldratt, 1984). The Theory of Constraints states that every system must have at least one constraint limiting its output. The theory is based on the idea of using scientific principles and logic to guide human-based organizations in their decision-making processes. Ultimately, the goal of the theory is to help organizations achieve their goals and, more importantly, continue doing so through changing times. Simply put, the theory is a recipe for change (Goldratt, 1984).

The underlying premise of the TOC is that every organization has, at any given time, at least one stumbling block (or constraint) that limits its performance and hampers the attainment of its goals. In the broadest sense, these constraints can be classified as either “internal constraints” or “market constraints”. In order to successfully improve the performance of the organization, the constraint must be identified and managed according to one of the processes involved in the theory. As with any dynamic situation, over time the constraint may change, either because the initial constraint was successfully managed, or because a changing environment has left the organization with a new constraint. At any rate, the constraint management process is continual (Goldratt, 1984).

**1.1.3 Conceptual Perspective**

Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and faeces (Tilley et al. 2014). The word 'sanitation' also refers to the
maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal (Stenström, 2015). According to UNDP (2010), sanitation is the hygienic means of promoting health through prevention of human contact with the hazards of wastes as well as the treatment and proper disposal of sewage or wastewater. Sanitation literally means measures necessary for improving and protecting health and wellbeing of the people (Evans, et al., 2012). Sanitation is any system that promotes proper disposal of human and animal wastes, proper use of toilet and avoiding open space defaecation. For the purposes of this study, the word ‘sanitation’ alone is taken to mean the safe management of human excreta. It therefore includes both the ‘hardware’ (e.g. latrines and sewers) and the ‘software’ (regulation, hygiene promotion) needed to reduce faecal-oral disease transmission. It encompasses too the re-use and ultimate disposal of human excreta.

Welfare, according to Guttman and Shlomit (2012) is a general term for the condition of an individual or group, for example their social, economic, psychological, spiritual or medical state. On the other hand, welfare is defined by Gallagher, et al., (2014) as a positive outcome that is meaningful for people and for many sectors of society, because it tells us that people perceive that their lives are going well. Tamir and Brett (2012) defined welfare as term used to refer to how well a person's life goes for the person who lives it. For the purpose of this study, people’s welfare was operationalized as their health status, quality of life, and dignity.

1.1.4 Contextual Perspective

According to Enquête Intégrale sur les Conditions de Vie des Ménages (English translation: Integral Investigation on the Conditions of Life of Households) (EICV, 2015), around 67.6% of Ngoma households have access to safe water including (74.2%) of households using an improved water source with 40.7% of households using protected springs, 11.6% using stand pipe, 1.3% having water piped into their dwelling/yard. Only 34.4% of Ngoma households are within 5-14 minutes of main drinking water source while 18.9% are within 15-29 minutes (Ngoma District Development Plan, 2013-2018). The situation is quite similar to that at the national level which is respectively 39% and 23.6%. 78.7% of the district population has access to basic sanitation against 74.5% of the population at the national level Ngoma District Development Plan (2013-2018). The majority use protected latrines (77.6%) and 7.1% don’t have latrines, which is a high score compared to national situation (6.1%). Waste management remains a problem where 17.5% of Households throw their domestic wastes in bushes or field and only 78.0% have composts. This is relatively lower than national level
where respectively 31.1% throw their wastes in bushes and 59.4% of Households use compost. In the town, the rate of Households who use public rubbish is 0.0% compared to national level of 5.0% (Ngoma District Development Plan, 2013-2018).

The government of Rwanda has over the years partnered with several international organizations to sponsor water projects with the aim of increasing water supply in its provinces. Among the core water projects that have increased the capacity of water supply in the Eastern province include Cyampirita Water Supply system that was completed in 2015. The project has significantly impacted 7615 households in Rugarama and Rwimbogo sectors in Gatsibo District. Another water project that was initiated by World Vision in Gatsibo District, aimed at providing water tanks to 80 Community Health Workers from Gakoni and Kiramuruzi cells of Kiramuruzi sector to fight water borne diseases and unnecessary deaths of children and women (Ministry of Infrastructure (MINIFRA), 2016).

For example, the Japanese International Corporation Agency (JICA) constructed water facilities and strengthened capacity of water associations in operations and maintenance of installed facilities. Water facilities have increased safe water access to more than 80,000 people in Rwamagana, Kayonza, Ngoma and Kirehe Districts. These projects include the Rwakibogo water project that provides clean water for over 41,800 people in Mwulire, Kigabiro and Munyaga Sectors in Rwamagana District. To ensure community’s direct involvement and proper maintenance in water supply, local governments have been given autonomy to manage water systems in conjunction with private operators (MINIFRA, 2016). This study assessed the effect of water and sanitation projects on the welfare of the people in Ngoma District.

1.2 Problem Statement
The importance of having good welfare is that it promotes happiness, joy, and peace of mind. This is because people who have good welfare are often innovative, creative and explorative. They enjoy every bit that life offers and associate well with other people both at work place and residence neighbourhood (Anand et al. 2015). Unfortunately, the welfare of the people of Ngoma District is not as admirable as could have been thought. According to Ngoma District Development Plan (2013-2018), most people have suffered from water borne diseases such as diarrhoea, cholera, etc. This is because several households have the problem of water in Ngoma District. Women walk long distances looking for water from dirty wells and distant spring water sources. This has affected their quality of life, dignity and general health.
Particularly, women’s life is strongly affected by unsafe, distant water supply and poor sanitation as women are generally responsible for water collection and handling, for household hygiene and caring of the sick (Ngoma District Development Plan, 2013-2018).

The government of Rwanda has over the years tried to provide safe water access through decentralization mechanisms and partnering with international organizations to promote water projects, however, their success have been minimal to a large extent, for example, unhygienic sanitary facilities for waste disposal, poor management of solid and liquid wastes and inadequate hygienic practices are still responsible for a large portion of the population’s disease burden in Ngoma District (Ngoma District Development Plan, 2013-2018). The water and sanitation projects have been spearheading the construction of water and sanitation facilities in the district in the past five years though its impact on the welfare of the people of Ngoma District has not been substantiated. This study therefore investigated the impact of water and sanitation projects on people’s welfare in Ngoma District, Rwanda.

1.3 Purpose of the Study
The purpose of this was to assess the effect of water and sanitation projects on peoples’ welfare in Ngoma District, Rwanda.

1.4 Objectives of the Study
i. To assess the performance of water and sanitation projects in Ngoma District.
ii. To assess the welfare of the people of Ngoma District.
iii. To establish the effect of water and sanitation projects on people’s welfare in Ngoma District.

1.5 Research Questions
i. How is the performance of water and sanitation projects in Ngoma District?
ii. How is the welfare of the people of Ngoma District?
iii. What is the effect of water and sanitation projects on people’s welfare in Ngoma District?

1.6 Hypothesis
H0: There is no significant effect of water and sanitation projects on people’s welfare in Ngoma District.

H1: There is a significant effect of water and sanitation projects on people’s welfare in Ngoma District.
1.7 Scope of the Study

1.7.1 Geographical scope

This study was conducted in Ngoma District which is located within the eastern province of Rwanda bordered by Kigarama, Gashanda and Nyakabande districts. Ngoma District has a Latitude: -2° 11’ 7.15” south and Longitude: 30° 28’ 10.60” east. The district was preferred because it has several water and sanitation projects sponsored by international organizations in the past 5 years.

1.7.2 Content Scope

This study was limited to the performance of water and sanitation projects in Ngoma District, the welfare of the people of Ngoma District, and the effect of water and sanitation projects and people’s welfare in Ngoma District.

1.7.3 Theoretical Scope

This study was guided by the Theory of Change (ToC) by Brest (2010), and Theory of Constraints (TOC) by Goldratt (1984).

1.7.4 Time Scope

This study assessed the performance of water and sanitation projects in Ngoma District covering a period of 5 years, that is, from 2011-2015. This was the period Rwanda took drastic initiative to improve water and sanitation in its provinces and Ngoma District which is in the eastern province was no exception. However, the actual study took a period of 6 months, that is, from November, 2016 to April, 2017. This period helped the research to draft a proposal, collect data, analyse the data and write the final report.

1.8 Significance of the Study

It is hoped that the findings of this study will help policy makers to improve on monitoring and evaluation in rural water supply. In other words, the study will provide more reliable information on the actual state of rural water and sanitation which will help policy makers to improve decision-making and strategy development.

Several projects have delved mostly in the areas of successful completion and implementation. However, this study will provide information that will enable project managers to be focused on services instead of projects (or groups of projects under
programmes), in which policy, institutional arrangements, planning, financing and governance of the sector all support water services at scale for rural populations indefinitely.

Furthermore, the findings of this study will help the government of Rwanda to promote capacity building targeted at improving the supply of sanitation products and services to the rural poor to reduce their vulnerabilities to preventable diseases.

Last but not least, this study will add to the body of knowledge new contributions which will be relevant to future researchers who may want to research on the same subject area.
CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

This chapter reviewed literature from different authors and scholars according to the objectives of the study. The chapter is subdivided into three sections, that is, theoretical review, conceptual framework, and review of related studies.

2.1 Theoretical Review

This study was guided by two theories: The Theory of Change (ToC) by Brest (2010), and the Theory of Constraints (TOC) by Goldratt (1984).

Theory of Change (ToC)

This study premised on the Theory of Change (ToC) by Brest (2010). Theory of Change explains the process of change by outlining causal linkages in an initiative, i.e., its shorter-term, intermediate, and longer-term outcomes. The identified changes are mapped –as the “outcomes pathway” – showing each outcome in logical relationship to all the others, as well as chronological flow. The links between outcomes are explained by “rationales” or statements of why one outcome is thought to be a prerequisite for another (Clark and Taplin, 2012).

The innovation of Theory of Change lies (1) in making the distinction between desired and actual outcomes, and (2) in requiring stakeholders to model their desired outcomes before they decide on forms of intervention to achieve those outcomes. A common error in describing Theory of Change is the belief that it is simply a methodology for planning and evaluation (Taplin, et al., 2013). Theory of Change is instead a form of critical theory that ensures a transparent distribution of power dynamics. Further, the process is necessarily inclusive of many perspectives and participants in achieving solutions.

The theory of change is related to this study in a way that when government brings in new initiative such as water supply and sanitation projects, the welfare of the local people will change since they will be able to receive safe, clean and cheap water supply. Similarly, availability of affordable clean water will help the people to practice good sanitation initiatives hence drastically changing their life style and overall wellbeing.
As the origins of Theory of Change lie in the field of evaluation and monitoring, developments over the years have ensured that Theory of Change continues to be an invaluable method to conduct evaluations of many different types of projects and organizations; often posing theory-based evaluation questions helps to focus evaluation efforts on key concerns. As well, there may be a need to pick the right indicators from among the many available, and one can use “monitoring questions” to select the indicators that will be most helpful. The monitoring questions take the form of “What do we really need to know in order to manage grant-making directed to the achievement of this outcome? (Weiss, 2013). It is important to understand success beyond just knowing “what works”. Experience has shown that blindly copying or scaling an intervention hardly ever works. An important task for monitoring and evaluation is to gather enough knowledge and understanding so as to be able to predict – with some degree of confidence – how an initiative and set of activities might work in a different situation, or how it needs to be adjusted to get similar or better results. We also need to be able to combine evidence from a number of studies in order to build a stronger picture of what is taking place, how it is unfolding, and, most importantly, how context influences the initiative (Weiss, 2013).

Just as development of a Theory of Change is a participatory process, a ToC-based monitoring and evaluation system can be designed in a participatory way. For example, grant managers for the water projects in Ngoma District can be involved in choosing the outcomes of greatest interest to them in their decision-making. Similarly, people (i.e. Ngoma District local leaders, stakeholders, and local community members) on the ground can have input into which indicators to use and how to operationalize them, choices of instruments and methods of data collection, and which existing sources of data may be used in tracking indicators of project progress (Patrizi and Quinn, 2010).

**Theory of Constraints (TOC)**

This study also adapted the Theory of Constraints (TOC) developed (Goldratt, 1984). The Theory of constraints states that every system must have at least one constraint limiting its output. The theory is based on the idea of using scientific principles and logic to guide human-based organizations in their decision-making processes. Ultimately, the goal of the theory is to help organizations achieve their goals and, more importantly, continue doing so through changing times. Simply put, the theory is a recipe for change (Goldratt, 1984).
The underlying premise of the TOC is that every organization has, at any given time, at least one stumbling block (or constraint) that limits its performance and hampers the attainment of its goals. In the broadest sense, these constraints can be classified as either “internal constraints” or “market constraints”. In order to successfully improve the performance of the organization, the constraint must be identified and managed according to the following processes involved in the theory: i) identify the constraint: identify the operation that is limiting the productivity of the system. This may be a physical or policy constraint; ii) exploit the constraint: achieve the best possible output from the constraint. Remove limitations that constrain the flow, and reduce non-productive output from the constraint. Remove limitations that constrain the flow, and reduce non-productive time, so that the constraint is used in the most effective way possible; iii) subordinate other activities to the constraint: link the output of other operations to suit the constraint. Smooth work flow and avoid build-up of work-in-process inventory. Avoid making the constraint wait for work; iv) elevate the constraint: in situations where the system constraint still does not have sufficient output invest in new equipment or increase staff numbers to increase output; and v) if anything has changed, go back to step one: Assess to see if another operation or policy has become the system constraint. As with any dynamic situation, over time the constraint may change, either because the initial constraint was successfully managed, or because a changing environment has left the organization with a new constraint. At any rate, the constraint management process is continual (Goldratt, 1990).

Klein and DeBruine (1995) state that TOC views an organisation as a chain composed of many links, or networks of chains. Viewed as a constrained system, a chain’s links all contribute to the goal and each link is strongly dependant on the other links. The chain, however, is only as strong as its weakest link. Goldratt’s TOC states that the overall performance of an organisation is limited by its weakest link. He states that if an organisation wants to improve its performance, the first step must be to identify the system’s weakest link, or constraint.

In other words if the water and sanitation projects in Ngoma District must be successful from the initial stage to the implementation and sustainability stage, constraints to the project must be identified at each stage accordingly and dealt with straightaway.
2.2 Conceptual framework

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<th>Independent Variable</th>
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<td>Water and Sanitation Project</td>
<td>People’s Welfare</td>
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<td>- Water facility</td>
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<td>- Sanitation facility</td>
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Figure 1: Conceptual Framework Showing the Relationship Between Water and Sanitation Project and People’s Welfare in Ngoma District

The diagrammatic illustration in figure 1 shows that water source and type of toilet facility can improve the welfare of the people of Ngoma District. This is because, good water source (such as piped water, borehole, spring well or tap) for drinking and other domestic use will promote good health and improve the quality of life of the people. Furthermore, the sanitation facilities such as flush toilet, ventilated improved pit latrine or pit latrine with slab promotes the dignity of the people. However, people that have poor water source and sanitation facilities are likely to suffer health related problems, live poor quality of life and feel undignified.

2.3 Review of Related Literature

2.3.1 The Performance of Water and Sanitation Projects

Water supply and sanitation are among two of the most important sectors of development (Bendahmane, 2013). Davis et al., (2013) explains that the development of community water supplies and sanitation results in improved social and economic conditions and improved health. The benefits of improved water supply and sanitation are many, including prevention of disease, improved basic health care, better nutrition, increased access to institutions such as health centers and schools, improved water quality, increased quantity of and access to water, reduction in time and effort required for water collection, promotion of economic activity, strengthening of community organization, improvements in housing, and ultimately, improved quality of life (Okun, 2014).
At the beginning of 2000, one-sixth (1.1 billion people) of the global population did not have access to improved water supply and two-fifths (2.4 billion people) did not have access to improved sanitation. The majority of these people live in Asia and Africa. Africa has the lowest water supply coverage of the global regions (Africa, Asia, Latin America and the Caribbean, Oceania, Europe, and North America) and is second to Asia in terms of lowest sanitation coverage. In Africa, 62% of the population have access to improved water supply and 60% have access to improved sanitation, but the situation is worse in rural areas—only 47% of the rural population have access to improved water supply and 45% have access to improved sanitation (WHO/UNICEF, 2010).

Access to water supply and sanitation is a fundamental need and a human right. It is vital for the dignity and health of all people. The health and economic benefits of water supply and sanitation to households and individuals (and especially to children) are well documented. Of special importance to the poor are the time-saving, convenience and dignity that improved water supply and sanitation represent. Those without access are the poorest and least powerful. Access for the poor is a key factor in improving health and economic productivity and is therefore an essential component of any effort to alleviate poverty.

According to the United Nations Development Programme (UNDP) (2011), progress has been good on increasing access to clean drinking water. The global target was surpassed, although rural areas were lagging behind and more than one in ten people still did not have full access to safe drinking water by the 2015 deadline. While some regions, such as east and south-east Asia, have already gone beyond the target, progress varies widely. Sub-Saharan Africa remains far behind: Despite having almost doubled the number of people using an improved water source between 1990 and 2008, coverage was still only 60% in 2008. The 2011 report showed slower worldwide progress with regard to basic sanitation, where the picture is quite bleak. The percentage of the world’s population using an adequate toilet rose just 7% from 1990 to 2008, from 54 to 61%. Almost half the population in developing regions did not have access to sanitary facilities, and an estimated 1.1 billion people practise open defecation, exposing themselves and their communities to major health risks. In sub-Saharan Africa, only 24% of the rural population were using an improved sanitation facility (UNDP, 2011).

The global impact studies by WHO/UN-WATER (2010) showed that, where there was access to improved water source, varying proportions of households in the communities studied did
not use it at all, or did not use it during part of the year. The reasons varied. They included long distance to the improved source, particularly in cases of scattered rural households; high number of users per water point causing long queuing time; availability of rain water as an alternative source during the rainy season and decrease in the water output of some improved water sources, particularly during the dry season. For example, in Mozambique, the impact evaluation found that paying for water did not create barriers to access for poor households, but 31% of households in villages where an improved water sources was introduced still did not use it. In this case the continued use of traditional sources was mainly explained by long distances to the improved water source (WHO/UN-WATER, 2010).

According to WHO/UNICEF (2010), the impact of education and training on the construction and use of toilets has in many cases been limited, but there are recent examples of approaches with promising results. For example, within a few years, the ‘Community Approach to Total Sanitation’ (CATS), promoted by UNICEF in Mozambique, achieved an increase of almost 14 % in households’ ownership of a private latrine and subsequent increased use of latrines in the communities studied. The hygiene of toilets also improved.

Another programme for which monitoring reports and external evaluations show promising results is the NGO BRAC’s programme in Bangladesh. The approach combined a broad range of activities aimed at awareness, small loans for the building and improvement of toilets for poorer households, subsidies for the poorest and loans and training for local entrepreneurs. The percentage of the population with an (improved) toilet increased significantly (WHO/UNICEF, 2010).

According to WHO/UNICEF (2010), developing country governments and their partners must devote more efforts and resources to implement more effective approaches in the rural sanitation sector. As a result of a predominantly technical orientation, government institutions are often not equipped for providing education and training for promotion of appropriate hygiene and sanitation behaviour, undermining effectiveness (WHO/UNICEF, 2010). Programme components for promotion of sanitation and hygiene are often left to NGOs and funded by donors. Collaboration between water and health authorities remains limited. Developing countries are often reluctant to invest in basic sanitation, particularly if the strategy to be pursued is not capital intensive. Where governments install capital-intensive sewage systems and waste water treatment plants, they may over-design them and/or miscalculate willingness to pay for services (WHO/UNICEF, 2010).
A study by Prüss-Üstün, et al (2008) in five countries found that the percentage of operational water supply facilities had increased with support from the programmes over the years. Eighty to ninety percent of the water supply facilities under review were operational at the time of the studies, some of which were evaluated many years after the water supplies had been installed. The high percentage was explained by varying factors such as management of facilities by motivated community level organisations of water users; strong community leadership; dependence of communities on the water source; the water supply facilities still being new; and rehabilitation of broken facilities by the government with donor assistance.


According to World Health Organisation and UNICEF (2010) report, the root causes of failed water and sanitation systems are weak institutions, inadequate support of institutions, lack of institutional monitoring, poor capacity of community and government structures, over reliance on NGOs and external financing from NGOs.

Fewtrell, et al., (2013) asserts that many programmes have tried to strengthen the role of the private sector in the installation and especially the maintenance of rural water and sanitation systems, but with limited success. Often the markets are too small, scattered and sporadic to make such work a viable business proposition. An even bigger challenge is paying for maintenance in the medium to long term, when major parts and sometimes whole systems may need renovation or replacement. Covering the full cost of long term maintenance from user charges is rarely feasible; an element of subsidy will remain necessary for the time being. Governments and funding agencies are often reluctant to confront this reality (Fewtrell, et al. 2013).

2.3.2.1 Water Facilities

In terms of water supply, those basic needs include access to a safe supply of water for domestic use, meaning water for drinking, food preparation, bathing, laundry, dishwashing, and cleaning (Bendahmane, 2013). In many cases, domestic water may also be used for watering animals and vegetable plots or gardens. Definitions of ‘access’ (distance to the nearest water-point and per capita availability) and ‘safe’ (water quality) may vary from country to country (Bendahmane, 2013).

According to Bourne (2004), the water supply system may be: a hand pump raising groundwater from a borehole or dug well; a stand post and tap connected to a pipe system (which may be supplied by motorized pumping or by gravity, from a borehole, stream,
reservoir, or spring source, with or without any water treatment); systems may consist of only a few stand posts in a village, or may be part of a larger regional or city-wide system; or a water butt supplied by rainwater from a roof catchment.

Dangerfield (2012) argues that a number of families share each hand pump or stand post (water-point), and family members (usually women and children) both collect water from it and often wash clothes or dishes there. Improved levels of service are provided by increasing the number of water points, so reducing the time and distance to collect water. Most convenient is the yard connection, where each family has a stand post on its own housing plot, or the house connection, where water is supplied into the house at a pressure which operates several taps in the bathroom and kitchen (Dangerfield, 2012).

However, Davis et al. (2013) expresses disappointment that in rural areas poor people have to work hard for their water, often fetching it from far-off sources and using it carefully and sparsely. The time spent collecting water is a double burden, as it means less time is available for the productive activities on which subsistence economies depend. In cities, the urban poor suffer the indignities of inadequate sanitation and frequently have to purchase water from private vendors. Research in slum and squatter settlements in Jakarta showed that less than a quarter of the city’s population have direct connections to a piped water system and 30 per cent depend solely on purchasing water from vendors.

According to WHO and UNICEF (2010), 89% of the world’s population used drinking water from improved sources (54% from a piped connection in their dwelling,. plot or yard, and 35% from other improved drinking water sources), leaving 780 million people lacking access to an improved source of water. Access to safe drinking water is measured by the percentage of the population having access to and using improved drinking water sources.

According to Center for Disease Control and Prevention (CDC) (2012), improved drinking water sources include: piped water connection, public standpipe, borehole, protected dug well, protected spring, and rain water collection. While unimproved drinking water sources include: unprotected dug well, unprotected spring, surface water (river, dam, lake, pond, stream, canal, and irrigation channel), and tanker truck water.

In Cambodia, water supply and sanitation service assessments were used to help increase the pro-poor focus of the national rural sector strategy. As a result, the National Strategy for Rural Water, Sanitation, and Hygiene 2011-2025 emphasized targeted intervention and
financing mechanisms to support the poor in gaining access to water and sanitation services. According to WSP (2014), the programme is focused on increasing the capacity of the central government to generate public policies on water and sanitation, including strengthening sector planning systems and pre-investment norms respectively; ensuring better alignment between public investments and inclusion, equity, accessibility, affordability and sustainability.

2.3.2.2 Sanitation Facilities
Sanitation literally means measures necessary for improving and protecting health and well-being of the people. Sanitation is any system that promotes proper disposal of human and animal wastes, proper use of toilet and avoiding open space defaecation. It also includes both the ‘hardware’ (e.g. latrines and sewers) and the ‘software’ (regulation, hygiene promotion) needed to reduce faecal-oral disease transmission. According to Manou-Savina (2012), it encompasses too the re-use and ultimate disposal of human excreta. The term environmental sanitation is used to cover the wider concept of controlling all the factors in the physical environment which may have deleterious impacts on human health and well-being.

Basic sanitation is the lowest-cost technology ensuring hygienic excreta and sullage disposal and a clean and healthful living environment both at home and in the neighborhood of users. According to Water Safety Plan (WSP) (2014), access to basic sanitation includes safety and privacy in the use of these services. Coverage is the proportion of people using improved sanitation facilities: public sewer connection; septic system connection; pour-flush latrine; simple pit latrine; ventilated improved pit latrine. An improved sanitation facility is defined as one that hygienically separates human excreta from human contact and includes: flush or pour flush toilet, ventilated improved pit latrine, pit latrine with slab and composting toilet.

Shared sanitation facilities are of an otherwise acceptable improved type of sanitation facility that is shared between two or more households. Shared facilities include public toilets. Unimproved sanitation facilities do not ensure hygienic separation of human excreta from human contact and include: pit latrine without slab or platform, hanging pit, bucket latrine, and open defecation in fields, forests, bushes, bodies of water or other open spaces (UNICEF, 2013).

Okun (2014) explains that in developing countries, it normally includes drainage, solid waste management, and vector control, in addition to the activities covered by the definition of sanitation. Safe excreta disposal for poor people usually involves the use of a family latrine,
which the family themselves keep clean. The latrine will use one of many various designs of pit, slab, and superstructure, and may also include a lid, vent pipe, or water seal to control flies and odour.

Poor slums and informal settlements are commonly found on low lying, flood-prone, or low-infiltration-capacity land with a high water table, leading to poor drainage and sanitation problems. Many poor people rely for bathing, laundering, and defecation on drainage channels, canals, and rivers which become clogged by garbage and flood when solid waste management is inadequate. Research in São Paulo, Brazil showed that only two per cent of slum dwellers have any form of sanitation (Hardoy et al., 2011). Improved access to natural sources of water or a piped water supply, along with appropriate and affordable sanitation, are essential ingredients in facilitating the social and economic development of poor rural and urban communities.

According to The Global Analysis and Assessment of Sanitation and Drinking Water (GLAAS)((2014) proper sanitation facilities (e.g. toilets and latrines) promote health because they allow people to dispose of their waste appropriately. Throughout the developing world, many people do not have access to suitable sanitation facilities, resulting in improper waste disposal. WHO (2014) reports that absence of basic sanitation facilities can: a) result in an unhealthy environment contaminated by human waste. Without proper sanitation facilities, waste from infected individuals can contaminate a community’s land and water, increasing the risk of infection for other individuals. Proper waste disposal can slow the infection cycle of many disease-causing agents. b) Contribute to the spread of many diseases or conditions that cause widespread illness and death. Without proper sanitation facilities, people often have no choice but to live in and drink water from an environment contaminated with waste from infected individuals, thereby putting themselves at risk of future infection. Inadequate waste disposal drives the infection cycle of many agents that can be spread through contaminated soil, food, water, and insects such as flies (WHO, 2014).

According to WHO/UNICEF (2010), only 63% of the world’s population used improved sanitation facilities, with Sub-Saharan Africa and Southern Asia having only 30% and 41% respectively. An estimated 2.5 billion people are still without improved sanitation. About 15% of the world’s population lives without any form of sanitation and practices open defecation.
According to WHO/UNICEF (2014) Joint Monitoring Programme for Water Supply and Sanitation (JMP), 36 per cent of the world’s population – 2.5 billion people – lack improved sanitation facilities and 1.1 billion people have no access to any type of improved drinking source of water. As a direct consequence: 1.6 million people die every year from diarrhoeal diseases (including cholera) attributable to lack of access to safe drinking water and basic sanitation and 90% of these are children under 5, mostly in developing countries; 160 million people are infected with schistosomiasis causing tens of thousands of deaths yearly; 500 million people are at risk of trachoma from which 146 million are threatened by blindness and 6 million are visually impaired; Intestinal helminths (ascariasis, trichuriasis and hookworm infection) affect 133 million people worldwide; there are around 1.5 million cases of clinical hepatitis A every year (WHO/UNICEF, 2014).

2.3.2 The Welfare of the People

Welfare is the health, happiness and fortunes of a person or a group. It could also mean a statutory procedure or social effort designed to promote the basic physical and material well-being of people in need (MaCurdy & Jeffrey 2008). On the other hand, welfare has been viewed as the provision of a minimal level of well-being and social support for citizens without current means to support basic needs. In most developed countries, welfare is largely provided by the government from tax income and to a lesser extent by charities, informal social groups, religious groups, and inter-governmental organizations (Leze, 2014).

According to Haveman (2001), welfare can take a variety of forms, such as monetary payments, subsidies and vouchers, or housing assistance. Welfare systems differ from country to country, but welfare is commonly provided to individuals who are unemployed, those with illness or disability, the elderly, those with dependent children, veterans.

In this study, water and sanitation projects established in Ngoma District are intended to provide the residence with clean and safe water which is near their areas of residence. This will help to improve their health by being safe from unnecessary diseases, quality of life and dignity of the local people.

2.3.2.1 Health

Health is the ability of individuals or communities to adapt and self-manage when facing physical, mental, or social changes (Huber et al. 2011). According to WHO (2006), health is a state of complete physical, mental, social wellbeing and not merely the absence of disease.
or infirmity. Health is a resource for everyday life, not the objective of living; it is a positive concept, emphasizing social and personal resources, as well as physical capabilities. Thus health is the ability to maintain homeostasis and recover from insults. Mental, intellectual, emotional and social health is referred to as a person’s ability to handle stress, to acquire skills, to maintain relationships, all of which form resources for resiliency and independent living WHO (2006).

Generally, the context in which an individual lives is of great importance for both his health status and quality of their life (Fielding et al. 2013). It is increasingly recognized that health is maintained and improved not only through the advancement and application of health science, but also through the efforts and intelligent lifestyle choices of individuals and society. According to WHO (2006), the main determinants of health include the social and economic environment, the physical environment, the person’s individual characteristics and behaviours.

More specifically, key factors that have been found to influence whether people are healthy or unhealthy include: income and social status, social support networks, education and literacy, employment/working conditions, social environments, physical environments, personal health practices and coping skills, healthy child development, biology and genetics, gender, culture and healthcare services (WHO, 2006).

Jadad (2013) argues that focusing more on lifestyle issues and their relationships with functional health, people can improve their health via exercise, enough sleep, maintaining a healthy body weight, limiting alcohol use and avoiding smoking. Health and illness can co-exist, as even people with multiple chronic diseases or terminal illnesses can consider themselves healthy.

The environment is often cited as an important factor influencing the health status of individuals. This includes characteristics of the natural environment, the built environment, and social environment. Factors such as clean water, air, adequate housing, and safe communities and roads all have been found to contribute to good health, especially to the health of infants and children (WHO, 2006).

Ensuring healthy lives and promoting well-being for all at all ages is important to building prosperous societies (WHO, 2012). However, despite great strides in improving people’s health and well-being in recent years, inequalities in health care access still persist. More than
six million children still die before their fifth birthday each year, and only half of all women in developing regions have access to the health care they need. Epidemics like HIV/AIDS thrive where fear and discrimination limit people’s ability to receive the services they need to live healthy and productive lives. Access to good health and well-being is a human right, and that is why the Sustainable Development Agenda offers a new chance to ensure that everyone can access the highest standards of health and health care—not just the wealthiest (WHO, 2012).

Some studies have shown that a lack of neighborhood recreational spaces including natural environment leads to lower levels of personal satisfaction and higher levels of obesity, linked to lower overall health and wellbeing (Bjork et al. 2008). This suggests that the positive health benefits of natural space in urban neighborhoods should be taken into account in public policy and land use.

According to Hein (2013), many factors influence health and some may have both good and bad influences. For example, surface water bodies can be beneficial as they can supply water for domestic and agricultural work, may be used for fishing and recreation, and can create a pleasant environment. However, they can also be breeding areas for insects and snails that transmit diseases such as malaria, dengue fever and schistosomiasis. Pollution of water bodies by humans also increases the risks to health. Factors that influence health can be grouped as follows: the environment, the awareness of individuals and communities about health, personal hygiene, health care, and disease.

To improve the health of people in a community a number of problems may need to be resolved. While it is better to address these problems in an integrated way, Andorno (2014) argues that it may be necessary to establish priorities and deal with the most pressing issues immediately. This situation could arise, for example, if communities or service providers have limited resources and can tackle only a few problems at a time. Community members may also have different perceptions of the main problems: people living in low-lying areas prone to flooding may feel that drainage is the major problem to be resolved, whereas those living in higher areas may be more concerned with water supply. If external bodies alone are responsible for prioritizing the issues, the priorities may not reflect community concerns and there may be a more limited sense of community ownership of a project (Andorno, 2014).
2.3.2.2 Quality of Life

Quality of life is the general wellbeing of individuals and societies, outlining negative and positive features of life. It observes life satisfaction, including everything from physical, health, family, education, employment, wealth, religious beliefs, finance and the environment. Quality of life has a wide range of contexts, including the fields of international development, healthcare, politics and employment (Barcaccia, 2013).

Derek et al. (2009) assert that standard indicators of the quality of life include not only wealth and employment, but also physical and mental health, education, recreation and leisure time, and social belonging. According to WHO (2006), quality of life is defined as the individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals.

Magee et al. (2012) posit that culture as a domain for assessing the quality of life includes: identity and engagement, creativity and recreation, memory and projection, belief and ideas, gender and generations, enquiry and learning, wellbeing and health. According to Morris (2013), frequently related are concepts such as freedom, human rights, and happiness. However, since happiness is subjective and difficult to measure, other measures are generally given priority. It has also been shown that happiness, as much as it can be measured, does not necessarily increase correspondingly with the comfort that results from increasing income (Morris, 2013).

Kahneman and Deaton (2010) argue that unlike per capita GDP or standard of living, both of which can be measured in financial terms, it is harder to make objective or long-term measurements of the quality of life experienced by nations or other groups of people. Researchers have begun in recent times to distinguish two aspects of personal well-being: Emotional well-being, in which respondents are asked about the quality of their everyday emotional experiences—the frequency and intensity of their experiences of, for example, joy, stress, sadness, anger, and affection—and life evaluation, in which respondents are asked to think about their life in general and evaluate it against a scale (Singer 2011; Helliwell 2016).

Research has attempted to examine the relationship between quality of life and productivity (Kahneman & Deaton, 2010). There are many different methods of measuring quality of life in terms of health care, wealth and materialistic goods. However, it is much more difficult to measure meaningful expression of one's desires. One way to do so is to evaluate the scope of
how individuals have fulfilled their own ideals. Quality of life can simply mean happiness, the subjective state of mind. By using that mentality, citizens of a developing country appreciate more since they are content with the basic necessities of health care, education and child protection (Singer, 2011).

According to van der Krieke (2016), quality of life is often regarded in terms of how a certain ailment affects a patient on an individual level. This may be a debilitating weakness that is not life-threatening; life-threatening illness that is not terminal; terminal illness; the predictable, natural decline in the health of an elder; an unforeseen mental/physical decline of a loved one; or chronic, end-stage disease processes. McNally (2014) assert that quality of life is the patient’s ability to enjoy normal life activities since life quality is strongly related to wellbeing without suffering from sickness and treatment.

Derek (2010) points out that quality of life is an important concept in the field of international development, since it allows development to be analyzed on a measure broader than standard of living. However, the author argues that there are varying ideas concerning what constitutes desirable change for a particular society, and the different ways that quality of life is defined by institutions therefore shapes how these organizations work for its improvement as a whole.

Organisations such as the World Bank, for example, declare a goal of "working for a world free of poverty", with poverty defined as a lack of basic human needs, such as food, water, shelter, freedom, access to education, healthcare, or employment (World Bank, 2009). In other words, poverty is defined as a low quality of life. Using this definition, the World Bank works towards improving quality of life through the stated goal of lowering poverty and helping people afford a better quality of life.

According to Spiegel (2013), improving quality of life involves action not only by NGOs, but also by governments. Global health has the potential to achieve greater political presence if governments were to incorporate aspects of human security into foreign policy. Stressing individuals’ basic rights to health, food, shelter, and freedom addresses prominent intersectoral problems negatively impacting today’s society and may lead to greater action and resources. Integration of global health concerns into foreign policy may be hampered by approaches that are shaped by the overarching roles of defense and diplomacy.
2.3.2.3 Dignity

Moral, ethical, legal, and political discussions use the concept of dignity to express the idea that a being has an innate right to be valued, respected, and to receive ethical treatment. In the modern context dignity can function as an extension of the Enlightenment-era concepts of inherent, inalienable rights (Adler & Weismann, 2010). English-speakers often use the word "dignity" in prescriptive and cautionary ways: for example, in politics it can be used to critique the treatment of oppressed and vulnerable groups and peoples, but it has also been applied to cultures and subcultures, to religious beliefs and ideals, to animals used for food or research, and to plants. "Dignity" also has descriptive meanings pertaining to human worth. In general, the term has various functions and meanings depending on how the term is used and on the context (Shultziner, 2003).

In ordinary modern usage it denotes "respect" and "status", and it is often used to suggest that someone is not receiving a proper degree of respect, or even that they are failing to treat themselves with proper self-respect. There is also a long history of special philosophical use of this term. However, it is rarely defined outright in political, legal, and scientific discussions (Harees, 2012). International proclamations have thus far left dignity undefined and scientific commentators, such as those arguing against genetic research and algeny, cite dignity as a reason but are ambiguous about its application (Myres et al. 2011).

Chapman (2010) explains that dignity is the quality of being honourable, noble, excellent or worthy. With a human regarded as the most supreme living creature, dignity, in its appealing sense, is better referred to as human dignity. It is the conceptual basis for the formulation and execution of human rights and is neither granted by the society nor can it be legitimately granted by the society. An imperative implication of human dignity is that every human being should be regarded as a very invaluable member of the community with a uniquely free expression of their right to life, integrated bodily attributes and their spiritual nature (Chapman, 2010).

According to TerMeulen (2010), human dignity is a sense of self-worth. Therefore, dignity is a sense of pride in oneself that a human being has with them. This conscious sense makes them feel that they deserve respect and honour from other human beings. Many scholars argue that if a human being is in a humiliating or compromising situation then this is a major threat to their dignity. However, other human persons may still assert that they have dignity.
even though they find themselves in such situations. All in all, humans deserve dignity not because of their lifelong achievements but by the fact they are already human beings (TerMeulen, 2010).

Sensen (2011) points out that dignity is important because it allows individuals and groups to feel respected, valued and connected with others around them. Dignity and respect are considered basic human rights, and both help people feel a sense of worthiness and importance. Dignity involves a mutual effort among people to listen, understand opinions and values and include one another in conversations. Treating people with dignity is an important practice in daily life. However, it can be overlooked in certain situations, such as when providing healthcare to elderly and disabled patients as well as when performing medical treatments on people of different races, socioeconomic statuses and ethnic identities. Showing dignity involves listening to and acknowledging concerns, making people feel their opinions are valued and speaking to them on an equal level (Saccà, 2013).

The deep philosophical roots of the term human dignity were articulated by Kant (1999), a great philosopher of the famous late Enlightenment. He is considered as the source of the now contemporary concept of human dignity. He holds that the fundamental principle behind moral duties of human beings is a categorical imperative. According to Kant, imperative means that it commands us to exercise our wills in a particular way. As a result, human beings with respect for human dignity should not possess any irrational wills against their fellow human beings and the generally acceptable societal norms and values (Sensen, 2011).

And according to Kant (1999), the only thing we should will about is our happiness as human beings. Once we have happiness we’ll be able to enjoy good health and nourish proper relationships. Human dignity should operate on the basis of volitional principles or maxims. Hence, the basic rational requirements and morality should be the primary demands that apply to these maxims which motivate all our actions.

Human dignity has also been developed along the lines of religious, theological and ethical perspectives. Christian and Islam views make up this perspective at large. According to the Christians, the Bible reveals that God not only created the human nature but also endowed man with unique qualities after creating man in His own image and likeness (Genesis 1:26). It is from this basis that we can deduce that the human nature deserves a very inherent dignity.
According to the Russian Orthodox Church’s basic teaching on the issue of human dignity, God has endowed all human beings in a very generous manner by distributing His gifts equally such that His showing of human dignity, nature and abundance of His unending grace remains undisputable. Owing to the fact that Jesus Christ offered His life as a ransom for sin and the sinful nature of human beings, human dignity was lifted at its best, hence it should be respected. The Bible also asserts that life according to the desires of the flesh that do not withstand respect for other human beings is loss of and abuse of human dignity (Ruud, 2010).

The Islam Texts Society puts forth the idea that human dignity is the basis of human rights. Several references are drawn from the Holy Quran which indicates that a human being deserves dignity as a result of their physical and spiritual nobility. The Quran says that God’s love for humanity is immense, the sanctity for human life immeasurable, the necessity for freedom a prerequisite thus restating the need for human equality and accountability for all acts done to humanity (Kamali, 2009).

For this reason, Sharia Laws have been developed to help in protecting human dignity and also promote a high level of social interaction. Since God has honoured mankind by His great love, human beings should also reciprocate the same and show their love and respect for their fellow human beings. In other words, dignity is not earned by the meritorious conduct which is an expression of the favour and grace of God towards human beings (Kamali, 2009).

The legal perspective of the concept of human dignity was coined at the end of the Second World War (De Koninck, 2012). It has been regarded as the central perspective that discourses human rights. The Universal Declaration of Human Rights states that all humans have been born with equality in dignity and rights. For this reason, they are endowed with enough reason and pure conscience, hence should act towards one another with a deep spirit of brotherhood. In its preamble, the Universal Declaration of Human Rights seeks for recognition and respect for the inherent dignity as well as the equal and inalienable rights of every member of the human dignity despite where they come from, their religious beliefs or background history (Shultziner & Rabinovici, 2012).

Drafters of this perspective add that the human person possesses many rights because of the fact they have been born as a person, wholly, a master and manager of oneself in many aspects (Frame, 2012). Therefore, all human beings deserve to be treated with utmost dignity. International Law, in pointing out the contempt of and disregard for human dignity says that
abuse of human rights has resulted in numerous barbarous acts that have completely outraged the pure conscience of mankind. Digging deep the question of human dignity has led to the coining of and questions in aspects of human liberty, equality and fraternity because many people died and suffered in the hands of their fellow human beings during the war.

Human dignity can be violated in multiple ways. The main categories of violations are (Kaufmann & Kuch, 2009):

Humiliation: Violations of human dignity in terms of humiliation refer to acts that humiliate or diminish the self-worth of a person or a group. Acts of humiliation are context dependent but we normally have an intuitive understanding where such a violation occurs. As Schachter (2014, p.347) noted, “it has been generally assumed that a violation of human dignity can be recognized even if the abstract term cannot be defined. More generally, etymology of the word “humiliation” has a universal characteristic in the sense that in all languages the word involves “downward spatial orientation” in which “something or someone is pushed down and forcefully held there” (Linder, 2013). This approach is common in judicial decisions where judges refer to violations of human dignity as injuries to people's self-worth or their self-esteem.

Instrumentalization or objectification: This aspect refers to treating a person as an instrument or as means to achieve some other goal. This approach builds on Emmanuel Kant's moral imperative stipulating that we should treat people as ends or goals in themselves, namely as having ultimate moral worth which should not be instrumentalized (O'Hara, 2013).

Degradation: Violations of human dignity as degradation refer to acts that degrade the value of human beings. These are acts that, even if done by consent, convey a message that diminishes the importance or value of all human beings. They consist of practices that human beings should not be subjected to, regardless of whether subjective humiliation is involved, such as selling oneself to slavery, or when a state authority deliberately puts prisoners in inhuman living conditions (Currie & de Waal, 2015).

Dehumanization: These are acts that strip a person or a group of their human characteristics. It may involve describing or treating them as animals or as a lower type of human beings. This has occurred in genocides such as the Holocaust and in Rwanda where the minority were compared to insects (Rodriguez, 2015).
2.3.3 Related Studies

Water is a precious resource and vital for life. Without it we would die within days. Access to a safe and affordable supply of drinking water is universally recognized as a basic human need for the present generation and a pre-condition for the development and care of the next. Water is also a fundamental economic resource on which people’s livelihoods depend. In addition to domestic water use, households use water for productive activities such as farming and livestock rearing in rural areas, or horticulture and home-based microenterprises in urban settlements (Mara & Cairncross, 2011).

Water shortage, poor quality water, or unreliable supply have profound effects on people’s well-being. Providing safe water alone is not enough, however, as water can quickly become unsafe, and the faecal–oral transmission of diseases can occur in other ways. If people do not have adequate and appropriate sanitation facilities or the chance to develop good hygiene practices, diseases can be spread through the contamination of water or through other pathways in the home environment. At any one time around half of all people in developing countries are suffering from one or more of the six main diseases associated with inadequate water supply and sanitation: diarrhoea, ascaris, dracunculiasis, hookworm, schistosomiasis, and trachoma (Hardoy et al. 2011).

Improving the health of the poor is a frequently cited goal of water and sanitation projects. The relationship is difficult to establish in practice at the project level, but over the longer term it can be demonstrated that there are significant health-associated benefits from improvements in water supply and sanitation provision, particularly when these are associated with changes in hygiene behaviour. The Water and Sanitation for Health programme (Esrey, 2012) found that in the 144 epidemiological studies that it had reviewed, the health impact of improved water supply and sanitation facilities was high, measured by significant reductions in morbidity rates (sickness) and higher child survival rates.

The White Paper on International Development treats water as both an economic and a social good in the context of the goals of sustainable development. The benefits of safe water supply and sanitation provision go beyond improvements to health, well-being, and quality of life. Access to convenient and affordable water can save people’s time and energy and enhance their livelihood opportunities. Improvements in sanitation will improve privacy and retain human dignity — significant and legitimate social development concerns. These less
quantifiable benefits are among the advantages of water supply and sanitation most often reported by people in low-income communities (Simpson-Hébert et al. 2012).

The dismal situation created by inadequate access to WS&S services is aggravated still further by large numbers of broken down or malfunctioning water and sanitation services. The health benefits of an improved water supply can be destroyed overnight if people are forced to revert to contaminated sources when the public supply fails. Capital investment in new services is wasted unless there is adequate provision for the reliable operation and maintenance of installed facilities (Almedom et al. 2013).

Telmo (2012) carried out a study on water supply and sanitation in Mali and found that the two types of water supply technologies present were hand dug wells and borehole pumps. There were also three types of hand dug wells: improved traditional wells, not improved traditional wells, and modern wells. Well depths ranged from 5.2 to 9.0 meters. Twenty-seven of the 38 water sources had water available year round, and all households had access to a water source with year round availability. The distance traveled to collect water ranged from 3 to 260 meters and the average distance traveled was 44 meters. Although all households had reasonable access to a water supply, not all households collected water from an improved source. The only improved water supply technologies in the village were two borehole pumps. Simple pit latrines were the only type of sanitation facilities present in the village and they are considered to be improved sanitation technologies.

Olukanni and Uchechukwu (2015) conducted a study focusing on the socioeconomic and cultural factors influencing Ota residents, a semi-urban town in South West Nigeria on WaSH services. The study used structured questionnaire as one of the major research instruments. The method of data analysis utilized descriptive analysis with illustrative data representations. Analysis of the data revealed that literacy level and age group play a significant role in housing settlements while source of water and quality significantly affect health, and its quantity affects sanitation practices. The evidence from the study confirmed that cultural practices and access to water sources had no direct relationship. Hence, the problem of good water supply was seen to be more of economic and financial challenges that require timely government intervention.

A review by Ashish and Amadi (2013) was done to explore the impact of water treatment, hygiene, and sanitary interventions on improving child health outcomes such as absenteeism, infections, knowledge, attitudes, and practices and adoption of point-of-use water treatment.
A literature search was conducted using the databases PubMed and Google scholar for studies published between 2009 and 2012 and focusing on the effects of access to safe water, hand washing facilities, and hygiene education among school-age children. Studies included were those that documented the provision of water and sanitation in schools for children less than 18 years of age, interventions which assessed WASH practices, and English-language, full-text peer reviewed papers. Fifteen studies were included in the final analysis. 73% (n = 11) of the studies were conducted in developing countries and were rural based (53%, n = 8). The child’s age, gender, grade level, socioeconomic index, access to hygiene and sanitary facilities, and prior knowledge of hygiene practices were significantly associated with the outcomes.

2.4 Research Gap

Several studies, that is to say, (Mara & Cairncross 2011; Hardoy et al. 2011; Esrey 2012; Simpson-Hébert et al. 2012; Telmo 2012; Almedom et al. 2013) have been done both within and outside Africa, but none was done in Rwanda and specifically Ngoma District. The present study was an attempt to close such a contextual gap. Similarly, the above studies did not capture water and sanitation, vis-à-vis people’s welfare, hence presenting a content gap which this study covered in terms of health, quality of life and dignity.
CHAPTER THREE
METHODOLOGY

3.0 Introduction

This section gives a summary of the research methodology, the target population, the sample size, and research instruments that were used in the data collection procedure and how the whole research was conducted. Research methodology is what makes social science scientific and a research plan of action to measure variables of interest. It also deals with the cognitive process of the research problem arising from the nature of its subject matter.

3.1 Research Design

This study adopted a cross-sectional survey design. A cross-sectional study is a type of observational study that analyses data collected from a population, or a representative subset, at a specific point in time. This study employed a cross-sectional research design because it allows for the study of the population at one specific time and the difference between the individual groups within the population to be compared. It also provides for the examination of the co-relationship between the study variables (Amin, 2005).

In addition to that, this study used quantitative approach as the main approach, with support from qualitative approach. The quantitative approach helped in the collection of data using numbers of units and measures of things and also examined patterns of similarities and differences across cases. On the other hand, the aim of qualitative approach in this study was to establish the socially constructed nature of reality, to stress the relationship between researcher and the object of the study as well as to emphasize the value-laden nature of the enquiry (Neuman, 2003).

3.2 Target Population

According to Welman et al. (2005), target population is the study object and consist of individuals, groups, organisations, human products and events, or the conditions to which they are exposed. The target population of this study included 336,928 participants (Rwanda Census, 2012) who were namely: the donor community (20), project managers (10), local leaders (40), and the local community (336,858).
3.3 Sample Size

The study used Solven’s formula to calculate the sample size of the study. Solven’s formula:

\[ n = \frac{N}{1 + N(\alpha)^2} \]

\[ n = \frac{336,928}{1 + 336,928 (0.05)^2} \]

\[ n = \frac{336,928}{1 + 336,928 (0.0025)} \]

\[ n = \frac{336,928}{1 + 842.32} \]

\[ n = \frac{336,928}{843.32} \]

\[ n = 400 \]

Therefore this study used a sample size of 400 respondents. Table 3.1 gives the summary of the target population and sample size.

Table 3.1: Target Population and Sample Size

<table>
<thead>
<tr>
<th>Category of the Respondents</th>
<th>Target Population</th>
<th>Sample Size</th>
<th>Sampling technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donor communities</td>
<td>20</td>
<td>10</td>
<td>Purposive sampling</td>
</tr>
<tr>
<td>Project managers</td>
<td>10</td>
<td>5</td>
<td>Purposive sampling</td>
</tr>
<tr>
<td>Local leaders</td>
<td>40</td>
<td>20</td>
<td>Purposive sampling</td>
</tr>
<tr>
<td>Local community</td>
<td>336,858</td>
<td>365</td>
<td>Simple random sampling</td>
</tr>
<tr>
<td>Total</td>
<td>336,928</td>
<td>400</td>
<td></td>
</tr>
</tbody>
</table>

3.4 Sampling Technique and Procedure

According to Welman et al. (2005) sampling is the process whereby the researcher is taking elements or units of analysis from the population in which they belong to include in a sample. The researcher used probability sampling specifically, simple random sampling (SRS) to
select the members of the local community. This was intended to allow each person a chance of participating in the study. According to Welman et al. (2005) in the simplest case of random sampling, each member of the population has the same chance of being included in the sample and each sample of a particular size has the same probability of being chosen. In this study, the researcher wrote the names of the local community members on pieces of papers, put the names in a bowel. The researcher shook the bowel and then selected \( n \) slips of paper. The lucky winners were considered the participants. Furthermore, the researcher used non probability sampling, that is, purposive sampling to select the local leaders, project managers and the donors because they were considered knowledgeable of the subject and could provide the most needed information regarding the subject matter.

3.5 Data Sources

3.5.1 Primary Data

The study collected primary data using questionnaires and interviews.

3.5.2 Secondary Data

The study used extracts, factsheets, bulletins and reports from WHO/UNICEF, and Rural Water Supply and Sanitation Initiative (RWSSI).

3.6 Data Collection Methods

The study used the following data collection methods: surveys, and interviews. The researcher preferred to use survey method because it is good for gathering descriptive data, relatively easy to administer, cost effective and time saving. This method was used to get information about the performance of water and sanitation projects and the welfare of the people of Ngoma District from the local community.

Furthermore, interviews were used because they are considered suitable for surveys, correlational and case studies, and gives opportunity for clarifying questions. The researcher used interviews to collect data about the performance of water and sanitation projects in Ngoma District from the donor communities, project managers, and the local leaders.
3.7 Research Instruments

Different sets of data collection instruments are used in research. According to Miller (2002) research instruments are tools used to collect or gather information from different sources in order to accomplish a certain type of study or work. This study used both questionnaires interview guides.

3.7.1 Questionnaires

This study used questionnaires to assess the performance of water and sanitation projects and the welfare of the people of Ngoma District from the local community members. The independent variable, water and sanitation was measured in terms of water facilities (7-items), and sanitation facilities (5-items). The dependent variable, people’s welfare was measured using health (5-items), quality of life (5-items), and dignity (5-items). Questionnaires were preferred by the researcher because large amounts of information can be collected from a large number of people in a short period of time and in a relatively cost effective way. The results of the questionnaire can usually be quickly and easily quantified by either a researcher or through the use of a software package such as Statistical Package for Social Sciences (SPSS). It can also be analysed more scientifically and objectively than other forms of research.

Furthermore, a five Likert scale was preferred so as to capture the varied opinions of the respondents as regard water and sanitation projects and the welfare of the people of Ngoma District. In a five Likert Scale; 5=strongly agree; 4=agree; 3=Not sure; 2=disagree; 1=strongly agree. Table 3.2 gives the interpretation of the mean range.

<table>
<thead>
<tr>
<th>#</th>
<th>Mean Range</th>
<th>Response Mode</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4.01-5.00</td>
<td>Strongly Agree</td>
<td>Very satisfactory</td>
</tr>
<tr>
<td>4</td>
<td>3.26-4.00</td>
<td>Agree</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>3</td>
<td>2.51-3.25</td>
<td>Undecided</td>
<td>Fairly satisfactory</td>
</tr>
<tr>
<td>2</td>
<td>1.76-2.50</td>
<td>Disagree</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>1</td>
<td>1.00-1.75</td>
<td>Strongly Disagree</td>
<td>Very Unsatisfactory</td>
</tr>
</tbody>
</table>
3.7.2 Interview Guides

This study employed interviews to assess the performance of water and sanitation projects in Ngoma District. Specifically, the interviews focused on how water and sanitation projects had improved the welfare of the people of Ngoma District. The interviews were addressed to the project managers, local leaders and the donors. Furthermore the interview on people’s welfare was addressed to ten (10) selected key informants. The interview instrument was preferred by the researcher because they are useful to obtain detailed information about personal feelings, perception and opinions; allows more detailed question to be asked, they usually achieve high response rate, respondent’s own words are recorded, and ambiguities can be clarified and incomplete answers followed up.

3.8 Validity and Reliability

3.8.1 Validity

Testing the validity of the research instruments enabled the researcher to determine whether the research instruments truly measure that which they intend to measure or how truthful the research results are (Cozby, 2001). This study used construct validity to ensure that the measure is actually measuring what it is intended to measure (i.e. the construct), and not other variables. This was achieved by using a panel of experts familiar with the construct. The experts (i.e. researcher’s supervisor and research defence panel) examined the items and what the items intended to measure. After the whole process, the content validity index (CVI) was be applied to determine the validity of the instrument. CVI was indicated by the formula below:

\[
CVI = \frac{\text{items declared relevant by experts}}{\text{total number of items}}
\]

Amin (2005) says if the CVI ≥0.70, the instruments are considered valid, otherwise it is not.

\[
CVI = \frac{23}{27}
\]

CVI=0.85

The CVI above implies that it is supported by Amin’s (2005) CVI ≥0.70. The conclusion is that, the instrument was valid.
3.8.2 Reliability
Reliability tests whether a research tool produces stable and consistent results (Neuman, 2003). This study used two types of reliability tests, that is: test-retest reliability, and internal consistency reliability. In the test-retest reliability, the researcher administered the instruments twice to the same respondents (i.e. local communities (5) and local leaders (5)). The scores from time 1 and time 2 were correlated in order to evaluate the test for stability over time. However, they were found to be consistent in each case. That is the first case had r=0.789; while the second case had r=0.788.

In addition, the researcher used internal consistency to evaluate the degree to which different test items that probe the same construct produce similar results. This was achieved using Cronbach’s alpha. According to Amin (2005), if the Cronbach’s alpha values are α≥0.70, the instrument is reliable, otherwise it is not. In the findings of this study, all the Cronbach’s alpha values of this study were α≥0.70. Table 3.3 gives the summary of the findings.

Table 3.3: Reliability of the Results

<table>
<thead>
<tr>
<th>Item</th>
<th>Number of items</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water facilities</td>
<td>7</td>
<td>0.822</td>
</tr>
<tr>
<td>Sanitation facilities</td>
<td>5</td>
<td>0.745</td>
</tr>
<tr>
<td>Health</td>
<td>5</td>
<td>0.742</td>
</tr>
<tr>
<td>Quality of life</td>
<td>5</td>
<td>0.826</td>
</tr>
<tr>
<td>Dignity</td>
<td>5</td>
<td>0.759</td>
</tr>
<tr>
<td>Water and Sanitation</td>
<td>12</td>
<td>0.729</td>
</tr>
<tr>
<td>People’s Welfare</td>
<td>15</td>
<td>0.775</td>
</tr>
</tbody>
</table>

3.9 Data Collection Procedures
An introduction letter was obtained from the College of Humanities and Social Sciences of Kampala International University after the approval of the validity of the research instruments. The researcher briefed the respondents about his intentions to carry out a study at their homes and offices. The researcher requested the respondents to consent to the study by signing on the informed consent form. The researcher also asked the respondent to answer all the questions in the questionnaires. The researcher retrieved the questionnaires immediately after they had been completed by targeted respondents. The researcher then arranged for data analysis.
3.10 Data Analysis
Quantitative data from the questionnaires from the field were compiled, sorted, edited and coded to have the required quality, accuracy and completeness. Then it was entered into the computer using the Statistical Package for Social Sciences (SPSS v. 22.0) for analysis. During the analysis of the data, frequencies and percentage distribution were used to analyze data on the profile of the respondents, while mean and standard deviations were used to assess objective one and objective two of the study. Furthermore, Pearson correlation and regression analysis was done to establish the extent to which water and sanitation projects have influenced the welfare of the people of Ngoma District. The level of significance was determined at 0.01.

Qualitative data was analysed using manual coding on the transcripts to identify the significant statements across individual interviews. Subsequent readings of the significant statements helped in identifying sub-themes emerging within the patterns. For presentation of thematic findings, both textural and structural descriptions were used in the results section. Textural descriptions are significant statements used to write what the participants experienced. Structural descriptions are the interpretation of the context or setting that influenced participants’ experiences. For textural descriptions, the quotes of participants were given in italics with the respondent to whom that quote belongs marked with type (i.e., donor, project leader or local leader). The structural descriptions as interpreted by the researcher were provided in plain text.

3.11 Ethical Consideration
Ethics is about values, priorities, and morals. It gives direction and guidance to what should be done on the basis of obligation and responsibility.

Permission for conducting the research was obtained from the College of Humanities and Social Sciences and other relevant authorities in Ngoma District. In addition to that, confidentiality and anonymity was ensured by not having to write the names of the respondents any part of the final report publication.

Neuman (2003) points out that the rights of subjects need to be protected or the statutory rights of members of the social community or groups being investigated, avoiding undue intrusion, obtaining informed consent, and protecting the rights to privacy of individuals and social groups. This study upheld Neumans’ views on protecting the rights of the population.
targeted. The researcher therefore got the consent of the respondents using informed consent form—none of the participants were coerced, their participation was completely on voluntary basis.

Another ethical issue that was considered was the integrity of the researcher. According to Ikoja (2002) there are eight elements a researcher must follow to do faithful and thorough work. These are accuracy in data collection and processing, use of appropriate research methodology, appropriate interpretation of the data, accurate reporting, and non-fabrication of data and or criminal misconduct. Therefore, the researcher attempted to the best of his ability and capability to stick to these principles.

3.12 Limitations to the Study

i. Uncooperative behavior of some respondents, un-approachable respondents and those who are reluctant to give information, especially the project managers and donors who claimed they were busy with work limited the researcher on several occasions. The researcher however solved this challenge by involving eligible participants who were less busy.

ii. Furthermore, the researcher was limited by extraneous variables such as honesty of the respondents where some of them did not say the truth, especially the local community members when answering the questions on the performance of water and sanitation projects. Some of them tended to answer in their own favour. However, the researcher mitigated this by interviewing the local leaders in order to establish the truth without any biasness.

iii. Some respondents were not able to answer the questionnaires correctly, especially those who were not educated. However, the researcher mitigated this by involving the participation of 2 research assistants who interpreted the English language for the non-educated respondents into the local dialect for them to understand properly.
CHAPTER FOUR  
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction
This chapter presents the analysis of the data gathered and interpretation thereof. It gives the demographic characteristics of the respondents and variables used.

4.1 Response Rate
The researcher distributed 400 questionnaires but was able to retrieve only 302 questionnaires that were correctly filled and answered. \( \left( \frac{302}{400} \times 100 \right) \) This gave a retrieval rate of 76%, according to Amin (2004), if the response rate is more than 70%, this is enough to carry on and continue with data analysis.

4.2 Demographic Characteristics of the Respondents
This section determines the demographic characteristics of the respondents. To achieve it, questionnaires were distributed to capture these responses. Frequencies and percentage distribution tables were employed to summarize the demographic characteristics of the respondents in terms of gender, age, education level, and number of household members. Table 4.1 gives the summary of the findings.
Table 4.1: Demographic Characteristics of the Respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>190</td>
<td>62.9</td>
</tr>
<tr>
<td>Male</td>
<td>112</td>
<td>37.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>302</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29 years</td>
<td>42</td>
<td>13.9</td>
</tr>
<tr>
<td>30-39 years</td>
<td>71</td>
<td>23.5</td>
</tr>
<tr>
<td>40-49 years</td>
<td>95</td>
<td>31.5</td>
</tr>
<tr>
<td>Above 50 years</td>
<td>94</td>
<td>31.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>302</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education level</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>106</td>
<td>35.1</td>
</tr>
<tr>
<td>Primary</td>
<td>89</td>
<td>29.5</td>
</tr>
<tr>
<td>Secondary</td>
<td>45</td>
<td>14.9</td>
</tr>
<tr>
<td>Tertiary</td>
<td>33</td>
<td>10.9</td>
</tr>
<tr>
<td>University</td>
<td>29</td>
<td>9.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>302</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of household members</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 members</td>
<td>72</td>
<td>23.8</td>
</tr>
<tr>
<td>3-6 members</td>
<td>108</td>
<td>35.8</td>
</tr>
<tr>
<td>More than 6 members</td>
<td>122</td>
<td>40.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>302</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: primary data, 2017

The results presented in table 4.1 revealed that majority, (62.9%) of the respondents were male, 31.5% were within the age group of 40-49 years, 35.1% were not educated and 40.4% had more than 6 members in the their households.

The next section presents the graphical representation of the demographic characteristics of the respondents in details.
The findings presented in figure 2 revealed that majority, 190 (63%) of the respondents were female while the male counterparts were represented by 112 (37%). The dominance of the women in the study was because they were readily available during data collection time than their male counterparts. In addition, the 2012 demographic household survey revealed that in Ngoma District there were 92 men per 100 women, an indication that women are generally more in population than the men.
The findings presented in figure 3 revealed that majority, 95 (32%) of the respondents were represented by 40-49 years, followed by respondents who were above 50 years, represented by 94 (31%), while respondents who were within the age group of 30-39 years and 20-29 years were represented by 71 (23%) and 42 (14%) respectively. The dominance of the age group between 40-49 years implies that the participants in the study were elderly people who understand very well matters of sanitation.

![Bar chart showing education levels of respondents.](image)

**Figure 4: Education Level of the Respondents**

The findings presented in figure 4 revealed that majority, 106 (35%) of the respondents were not educated, followed by 89 (30%) who were educated up to primary level, and 45 (15%) who were educated up to secondary level. Furthermore, respondents who were educated up to tertiary and university level were represented by 33 (11%) and 29 (10%) respectively. The dominance of the none educated in this study is because most of them are within the age group of 40-49 years. This is supported by the Rwanda Demographic and Health Survey (2014/2015) where those within 40-44 years and 45-49 were not educated and were represented by 24.2% and 35.6% respectively.
The findings presented in figure 5 revealed that majority, 122 (40%) of the respondents had more than 6 household members, followed by 108 (36%) who had 3-6 household members and 72 (24%) who had 1-3 household members. The dominance of the respondents with more than 6 household members is evident that Africans still prefer extended families to nuclear families.

4.2 Objective one: The Performance of Water and Sanitation Projects in Ngoma District

The first objective of this study was to assess the performance of water and sanitation projects in Ngoma District. The following denotations were used for clarity in interpretation: SD=strongly disagree, D=disagree, NS=Not sure, A=Agree, SA=strongly agree. Furthermore, the mean values in table 4.2 were interpreted using the mean ranges indicated below.

<table>
<thead>
<tr>
<th>#</th>
<th>Mean Range</th>
<th>Response Mode</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4.01-5.00</td>
<td>Strongly Agree</td>
<td>Very satisfactory</td>
</tr>
<tr>
<td>4</td>
<td>3.26-4.00</td>
<td>Agree</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>3</td>
<td>2.51-3.25</td>
<td>Undecided</td>
<td>Fairly satisfactory</td>
</tr>
<tr>
<td>2</td>
<td>1.76-2.50</td>
<td>Disagree</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>1</td>
<td>1.00-1.75</td>
<td>Strongly Disagree</td>
<td>Very Unsatisfactory</td>
</tr>
</tbody>
</table>
Table 4.2: The Performance of Water and Sanitation Projects in Ngoma District

N=302

<table>
<thead>
<tr>
<th>Water Facility</th>
<th>SD (%)</th>
<th>D (%)</th>
<th>NS (%)</th>
<th>A (%)</th>
<th>SA (%)</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>You boil your water to make it safe.</td>
<td>16(5.3)</td>
<td>14(4.6)</td>
<td>16(5.3)</td>
<td>142(47)</td>
<td>114(37.7)</td>
<td>4.07</td>
<td>1.045</td>
</tr>
<tr>
<td>You use public tape water.</td>
<td>17(5.6)</td>
<td>25(8.3)</td>
<td>38(12.6)</td>
<td>136(45)</td>
<td>86(28.5)</td>
<td>3.82</td>
<td>1.105</td>
</tr>
<tr>
<td>You use borehole water.</td>
<td>31(10.3)</td>
<td>36(11.9)</td>
<td>4(1.3)</td>
<td>145(48)</td>
<td>86(28.5)</td>
<td>3.73</td>
<td>1.276</td>
</tr>
<tr>
<td>You use protected spring water.</td>
<td>33(10.9)</td>
<td>59(19.5)</td>
<td>40(13.2)</td>
<td>102(33.8)</td>
<td>68(22.5)</td>
<td>3.37</td>
<td>1.318</td>
</tr>
<tr>
<td>Your water source is within 1-10 minutes from your household.</td>
<td>64(21)</td>
<td>108(35.8)</td>
<td>0(0)</td>
<td>67(22)</td>
<td>63(20.9)</td>
<td>2.24</td>
<td>1.500</td>
</tr>
<tr>
<td>You treat your water to make it safe.</td>
<td>102(33.8)</td>
<td>128(42.4)</td>
<td>17(5.6)</td>
<td>41(13.6)</td>
<td>14(4.6)</td>
<td>2.13</td>
<td>1.158</td>
</tr>
<tr>
<td>You use piped water into dwelling/plot.</td>
<td>114(37.7)</td>
<td>120(39.7)</td>
<td>5(1.7)</td>
<td>51(16.9)</td>
<td>12(4)</td>
<td>2.10</td>
<td>1.193</td>
</tr>
<tr>
<td>Average</td>
<td>60(19.9)</td>
<td>62(20.4)</td>
<td>17(7.1)</td>
<td>98(32.3)</td>
<td>63(20.9)</td>
<td>3.07</td>
<td>1.123</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sanitation Facility</th>
<th>SD (%)</th>
<th>D (%)</th>
<th>NS (%)</th>
<th>A (%)</th>
<th>SA (%)</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>You throw domestic rubbish in the bush/field</td>
<td>32(10.6)</td>
<td>36(11.9)</td>
<td>44(14.6)</td>
<td>114(37.7)</td>
<td>76(25.2)</td>
<td>3.55</td>
<td>1.277</td>
</tr>
<tr>
<td>You use pit latrine in your household</td>
<td>36(11.9)</td>
<td>42(13.9)</td>
<td>36(11.9)</td>
<td>116(38.4)</td>
<td>72(23.8)</td>
<td>3.48</td>
<td>1.314</td>
</tr>
<tr>
<td>You do not have toilet facility in your household</td>
<td>54(17.9)</td>
<td>100(33.1)</td>
<td>10(3.3)</td>
<td>20(6.6)</td>
<td>118(39.1)</td>
<td>3.16</td>
<td>1.631</td>
</tr>
<tr>
<td>You use flush toilet system</td>
<td>80(26.5)</td>
<td>90(29.8)</td>
<td>44(14.6)</td>
<td>70(23.2)</td>
<td>18(6)</td>
<td>2.53</td>
<td>1.266</td>
</tr>
<tr>
<td>You throw domestic rubbish in composts</td>
<td>80(26.5)</td>
<td>140(46.4)</td>
<td>12(4)</td>
<td>42(13.9)</td>
<td>28(9.3)</td>
<td>2.33</td>
<td>1.261</td>
</tr>
<tr>
<td>Average</td>
<td>56(18.7)</td>
<td>82(27)</td>
<td>29(9.7)</td>
<td>72(24)</td>
<td>62(20.7)</td>
<td>3.01</td>
<td>1.350</td>
</tr>
<tr>
<td>Overall average</td>
<td>58(19.3)</td>
<td>72(23.7)</td>
<td>23(8.4)</td>
<td>85(28.2)</td>
<td>63(20.8)</td>
<td>3.04</td>
<td>1.285</td>
</tr>
</tbody>
</table>

Source: primary data, 2017

The findings presented in table 4.2 revealed that majority, 28.2% of the respondents agreed that the performance of water and sanitation projects in Ngoma District was fairly satisfactory (average mean=3.04, Std=1.285). This was attributed to the fact that majority (32.3%) of the respondents agreed on having improved water facilities, however, 27% of the respondents disagreed on having improved sanitation facilities. To further explain the above
results in detail; the performance of water facilities and sanitation facilities were explained differently as indicated in the next paragraphs.

As regard the performance of water facilities in Ngoma District, the general assessment indicated that majority, (32.3%) of the respondents agreed on having and accessing water facilities. The mean result interpreted this finding as fairly satisfactory (mean=3.07, Std=1.229). This was attributed to the fact that majority, (35.8%) of the respondents disagreed that their water source was within 1-10 minutes from their household (mean=2.24, Std=1.500), 42.4% disagreed that they treat water to make it safe (mean=2.13, Std=1.158), while 39.7% of the respondents disagreed that they use piped water into dwelling/plot (mean=2.10, Std=1.193). However, 47% of respondents agreed that they boil their water to make it safe (mean=4.07, Std=1.045), while 45% agreed that they use public tape water (mean=3.82, Std=1.105). Similarly, 48% of the respondents agreed that they use borehole water (mean=3.73, Std=1.276) and 33.8% agreed on using protected spring water (mean=3.37, Std=1.318).

The above findings imply that respondents do not treat water with any chemical such as chlorine or anything because they cannot afford it, instead they boil it to make it safe. In addition, most of the respondents still do not have piped water into dwelling, instead they use boreholes and protected spring that is a bit far from the household. This is true because most of the water projects being done in Ngoma District are basically drilling boreholes and setting up protected water spring wells so as to help the community access clean water.

This implies that access to water clean and safe water supply and sanitation is a fundamental need and a human right. It is vital for the dignity and health of all people. The health and economic benefits of water supply and sanitation to households and individuals (and especially to children) are well documented. Of special importance to the poor are the time-saving, convenience and dignity that improved water supply and sanitation represent. Those without access are the poorest and least powerful. Access for the poor is a key factor in improving health and economic productivity and is therefore an essential component of any effort to alleviate poverty.

Furthermore, the findings presented in table 4.2 revealed that sanitation facilities used by the households of Ngoma District was assessed by respondents as fairly satisfactory (average mean=3.04, Std=1.285). This was attributed to the fact that majority (37.7%) of the respondents agreed that they throw domestic rubbish in the bush/field (mean=3.55,
while 46.4% of the respondents disagreed that they throw domestic rubbish in composts (mean=2.33, Std=1.261). In addition, 38.4% agreed that they use pit latrines (mean=3.48, Std=1.314) while 39.1% strongly agreed that they do not have toilet facilities in their households (mean=3.16, Std=1.631), and 29.8% disagreed that they have flush toilet system in their houses (mean=2.53, Std=1.266).

The above findings imply that most of the households in Ngoma District still throw their rubbish in bushes instead of composts. A good number of the households have pit latrines, though there are some households that do not have toilet facilities; only a few of them have flush toilet system. The common pit latrine is usually a hole dug in the ground, with a cover slab made of wood, mud (or occasionally mortar) overlaying the wood, and some sort of structure built for privacy. This latrine can work well if the pit is deep, the inside of the structure is dark, the slab floor is a smooth and impervious surface that is kept clean, and a cover plate is used to prevent flies from entering the pit. However, in most cases the pit is shallow, the structure allows a lot of light in, the slab is not clean and is simply a mud and wood floor, and a cover plate is not used.

A pit latrine that is too shallow or too full, with the contents too close to the user, smells bad and there is a greater chance of the spread of disease. The wood and mud floor of a traditional latrine is difficult to keep clean, and a floor that is not clean and does not allow water to drain away is unsanitary and provides a breeding ground for mosquitoes and hookworm larvae. The floor of a traditional latrine is also subject to deterioration from weathering. Pit latrines without supported sides can collapse from the inflow of surface water that erodes the sides, and the wood slab is subject to attack from termites or rot which can cause collapse.

However, simple pit latrines can be improved by plastering the mud floor with mortar, making the floor surface smooth, impervious, and sloping. This makes the floor easier to clean and allows for water to drain. Similarly, another simple and cheap improvement to a pit latrine is to install a prefabricated reinforced concrete slab.

### 4.3 Qualitative Data

This section captured data from donors, project managers and local leaders as key interview informants. The interview mainly focused on the performance of the water and sanitation projects in Ngoma District. In the face to face interview with the key informants, the researcher asked this question: which water and sanitation projects have been successfully completed and implemented in this district? This question was specifically directed to the
project manager in one of the sectors in Ngoma district were the water and sanitation project was being carried out. The researcher gave the summary to the response to the interview question as indicated below:

“....so far we have Karembo water project funded by the Norwegian Red Cross. The first phase of the project has been completed and supporting population of 7,500 with safe drinking water...the second phase is extension of the Phase 1 by constructing spring protection pipeline network, covering Kazo, Kibungo, Mugesera, Murama, Mutenderi, Remera, and Rukira. Phase 2 will support 190,000 inhabitants........” (Project Manager).

The researcher further posed this question to the key informants (donor personnel, project manager, and the local leaders) in a face to face interview; what are the benefits of the water and sanitation projects to the people of Ngoma District? The researcher recorded and summarised their responses as indicated below:

“..........the main objective of the project was to contribute to improving public health and community welfare in Ngoma District by supplying sufficient quantity of quality water to the population and promoting hygiene and sanitation........” (Donor, Norwegian).

“.....this project is expected to provide the households in target area with easy access to safe drinking water....and increase the number of families able to practice safer hygiene and behaviour change towards hygiene and sanitation.....” (Project manager).

“........these projects will be equally important to ensure that all the ‘partially covered’ habitations having a supply level of less than 10 litres per capita per day (lpcd) and those habitations facing a severe water quality problem are fully covered with safe drinking water facilities on a sustainable basis.........” (Local Leader, district level).

“........they have come and they are building latrines for households which are too poor to do it themselves.......they are also training us on issues related to safe handling of drinking water, disposal of waste water, safe disposal of human excreta, safe solid waste disposal, home sanitation and food hygiene, personal hygiene,
particularly, washing one’s hand with soap, and sanitation in community.”” (Local leader, Sector level).

“…..they intervene on one hand in maintenance and operation of hand pumps as well as supporting local people to own them by establishing committees for better management…together with their counterparts, they rehabilitate broken parts and sensitize the users to collect money which can serve them in case the hand pumps are broken.”” (Local leader, Village level).

On the other hand, the researcher asked the key interview informants of the challenges that the water and sanitation projects have been facing in the past 2 years in Ngoma District. The interview was quoted as “what challenges have these projects been meeting in the past 2 years in Ngoma District?” Their responses were summarized as below:

“…..the projects are progressing well, only that sometimes funds delay hence delaying the different phases of the projects and affecting coverage.”” (Project Manager).

“…..we have trouble with the local politicians-they are always interfering with our activities and this is not good for business…..in one case, they mobilized the local community to protest the compensation that was to be given to the affect people because their land would be used for the project purposes.”” (Donor, Japan (JICA)).

“…..this country still faces challenge of institutional framework where there is a lot of bureaucracy….before a simple procurement supply and logistics is approved for the water project, a lot of government officers must append their signatures, hence causing a lot of delays.”” Project Manager).

The above responses imply that the government and the local politicians should make sure they work hand in hand with the donors, project managers and the members of the community in order to ensure smooth running of the project and its successful completion and implementation.
4.4 Objective two: The Welfare of the People of Ngoma District

The second objective of this study was to assess the welfare of the people of Ngoma District. In order to achieve this, the questionnaires were distributed to the local community members. The welfare was measured using health, quality of life, and dignity. The following denotations were used for clarity in interpretation: SD=strongly disagree, D=disagree, NS=Not sure, A=Agree, SA=strongly agree. Furthermore, the mean values in table 4.3 were interpreted using the mean ranges indicated below.

<table>
<thead>
<tr>
<th>#</th>
<th>Mean Range</th>
<th>Response Mode</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4.01-5.00</td>
<td>Strongly Agree</td>
<td>Very satisfactory</td>
</tr>
<tr>
<td>4</td>
<td>3.26-4.00</td>
<td>Agree</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>3</td>
<td>2.51-3.25</td>
<td>Undecided</td>
<td>Fairly satisfactory</td>
</tr>
<tr>
<td>2</td>
<td>1.76-2.50</td>
<td>Disagree</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>1</td>
<td>1.00-1.75</td>
<td>Strongly Disagree</td>
<td>Very Unsatisfactory</td>
</tr>
</tbody>
</table>
Table: 4.3: People’s Welfare (n=302)

<table>
<thead>
<tr>
<th>People's Welfare</th>
<th>SD(%)</th>
<th>D(%)</th>
<th>NS(%)</th>
<th>A(%)</th>
<th>SA(%)</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have been having positive emotions in the past 6 months.</td>
<td>17(5.6)</td>
<td>26(8.3)</td>
<td>37(12.3)</td>
<td>146(48.3)</td>
<td>76(25.2)</td>
<td>3.79</td>
<td>1.088</td>
</tr>
<tr>
<td>I have been on a healthy diet in the past 6 months.</td>
<td>20(6.6)</td>
<td>37(12.3)</td>
<td>23(7.6)</td>
<td>158(52.3)</td>
<td>64(21.2)</td>
<td>3.69</td>
<td>1.133</td>
</tr>
<tr>
<td>I have been so much in control of my health in the past 6 months.</td>
<td>26(8.6)</td>
<td>20(6.6)</td>
<td>11(3.6)</td>
<td>50(16.6)</td>
<td>138(45.7)</td>
<td>3.46</td>
<td>1.719</td>
</tr>
<tr>
<td>I have been satisfied with my life in the past 6 months.</td>
<td>20(6.6)</td>
<td>51(16.9)</td>
<td>46(15.2)</td>
<td>139(46)</td>
<td>46(15.2)</td>
<td>3.46</td>
<td>1.137</td>
</tr>
<tr>
<td>I have been feeling sickly in the past 6 months.</td>
<td>15(5)</td>
<td>141(46.7)</td>
<td>11(3.6)</td>
<td>36(11.9)</td>
<td>99(32.8)</td>
<td>2.45</td>
<td>1.133</td>
</tr>
<tr>
<td><strong>Average mean</strong></td>
<td>31(10.3)</td>
<td>34(11.2)</td>
<td>26(8.5)</td>
<td>127(42)</td>
<td>85(28)</td>
<td>3.37</td>
<td>1.242</td>
</tr>
<tr>
<td><strong>Quality of Life</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have been very friendly to people in the past 6 months.</td>
<td>13(4.3)</td>
<td>18(6)</td>
<td>16(5.3)</td>
<td>162(53.6)</td>
<td>93(30.8)</td>
<td>4.01</td>
<td>.995</td>
</tr>
<tr>
<td>I have been feeling full of life in the past 6 months.</td>
<td>15(5)</td>
<td>21(7)</td>
<td>18(6)</td>
<td>154(51)</td>
<td>94(31.1)</td>
<td>3.96</td>
<td>1.048</td>
</tr>
<tr>
<td>I have been feeling peaceful and calm in the past 6 months.</td>
<td>14(4.6)</td>
<td>15(5)</td>
<td>30(9.9)</td>
<td>165(54.6)</td>
<td>78(25.8)</td>
<td>3.92</td>
<td>.985</td>
</tr>
<tr>
<td>I have been feeling my life has a clear sense of purpose in the past 6 months.</td>
<td>10(3.3)</td>
<td>23(7.6)</td>
<td>42(13.9)</td>
<td>140(46.4)</td>
<td>87(28.8)</td>
<td>3.90</td>
<td>1.011</td>
</tr>
<tr>
<td>I have been feeling cheerful in the past 6 months.</td>
<td>13(4.3)</td>
<td>32(10.6)</td>
<td>25(8.3)</td>
<td>156(51.7)</td>
<td>76(25.2)</td>
<td>3.83</td>
<td>1.058</td>
</tr>
<tr>
<td><strong>Average mean</strong></td>
<td>13(4.3)</td>
<td>22(7.2)</td>
<td>26(8.7)</td>
<td>155(51.5)</td>
<td>86(28.3)</td>
<td>3.92</td>
<td>1.019</td>
</tr>
<tr>
<td><strong>Dignity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People have been showing me respect in the past 6 months.</td>
<td>17(5.6)</td>
<td>23(7.6)</td>
<td>16(5.3)</td>
<td>162(53.6)</td>
<td>84(27.8)</td>
<td>3.90</td>
<td>1.066</td>
</tr>
<tr>
<td>I have been feeling worthy of myself in the past 6 months.</td>
<td>19(6.3)</td>
<td>20(6.6)</td>
<td>31(10.3)</td>
<td>146(48.3)</td>
<td>86(28.5)</td>
<td>3.86</td>
<td>1.097</td>
</tr>
<tr>
<td>I have been feeling confident in the past 6 months.</td>
<td>15(5)</td>
<td>34(11.3)</td>
<td>37(12.3)</td>
<td>153(50.7)</td>
<td>63(20.9)</td>
<td>3.71</td>
<td>1.072</td>
</tr>
<tr>
<td>I have been inspirational to people in the past 6 months.</td>
<td>17(5.6)</td>
<td>141(46.7)</td>
<td>19(6.3)</td>
<td>43(14.2)</td>
<td>82(27.2)</td>
<td>3.11</td>
<td>1.384</td>
</tr>
<tr>
<td>I have been living a quality life in the past 6 months.</td>
<td>18(6)</td>
<td>122(40.4)</td>
<td>51(16.9)</td>
<td>41(13.6)</td>
<td>70(23.2)</td>
<td>3.08</td>
<td>1.306</td>
</tr>
<tr>
<td><strong>Average mean</strong></td>
<td>17(5.7)</td>
<td>68(22.5)</td>
<td>31(10.2)</td>
<td>109(36.1)</td>
<td>77(25.5)</td>
<td>3.52</td>
<td>1.185</td>
</tr>
<tr>
<td><strong>Overall average mean</strong></td>
<td>20(6.8)</td>
<td>41(13.6)</td>
<td>28(9)</td>
<td>130(43.2)</td>
<td>83(27.3)</td>
<td>3.70</td>
<td>1.149</td>
</tr>
</tbody>
</table>

Source: primary data, 2017

The findings presented in table 4.3 revealed that majority (43.2%) of the respondents agreed that people’s welfare was satisfactory (overall average mean=3.70, Std=1.149). This was attributed to the satisfactory level of health, quality of life and dignity of the people of Ngoma District.
For example, the findings presented in table 4.3 revealed that health was assessed by respondents as satisfactory (average mean=3.37, Std=1.242). This was attributed to the fact that majority (48.3%) of the respondents agreed that they have been having positive emotions in the past 6 months (3.79, Std=1.088), while (52.3%) agreed that they have been on a healthy diet in the past 6 months (mean=3.69, Std=1.133). In addition, 45.7% of respondents agreed that they have been so much in control of their health in the past 6 months (mean=3.46, Std=1.719) and 46% agreed that they have been generally satisfied with their life (mean=3.46, Std=1.137). On the other hand, 46.7% of the respondents disagreed that they have been feeling sickly in the past 6 months (mean=2.45, Std=1.133).

The findings imply that regarding health, most of the people of Ngoma District have not been facing challenges. This is because most of them understand very well what it means to live healthy because they have been taking diets and reporting any health irregularities to the health sector. This therefore shows that their welfare in terms of health has been satisfactory. In other words, most of them have been observing good sanitation by having pit latrines, and having access to safe and clean water from protected springs and boreholes. Their water was also boiled and at times treated before they can be used. This means that they are not vulnerable to diseases anyhow.

The findings presented in table 4.3 revealed that quality of life as an indicator of peoples welfare in Ngoma District was assessed by respondents as satisfactory (average mean=3.92, Std=1.019). This was attributed to the fact that majority (53.6%) of the respondents strongly agreed that they have been very friendly to people in the past 6 months (mean=4.01, Std=0.995), (51%) of the respondents agreed that they have been feeling full of life in the past 6 months (mean=3.96, Std=1.048), while and (54.6%) agreed that they have been feeling peaceful and calm in the past 6 months (mean=3.92, Std=0.985). Furthermore, (46.4%) of the respondents agreed that they have been feeling their life had a clear sense of purpose in the past 6 months (mean=3.90, Std=1.011), and 51.7% agreed that they have feeling cheerful in the past 6 months (mean=3.83, Std=1.058).

The above findings imply that quality of life of the people of Ngoma District is satisfactory given the fact that they have positive attitude towards one another and towards life. Most of them are happy, peaceful and calm. In other words, these people are satisfied with life’s offers, including everything from physical, health, family, and the environment. They are not
stressed and suppressed with diseases. Otherwise they would have shown signs of frustration, loneliness, stress, and violence.

The findings presented in table 4.3 revealed that dignity as a measure of people’s welfare was assessed by respondents as satisfactory (average mean=3.52, Std=1.185). This was attributed to the fact that majority (53.6%) of the respondents agreed that they have been receiving respect from people in the past 6 months (mean=3.90, Std=1.066), and 48.3% agreed that the respect accorded to them made them feel worthy of themselves (mean=3.86, Std=1.097). Furthermore, (50.7%) of the respondents agreed that they have been feeling confident of themselves (mean=3.71, Std=1.072), though not inspirational to people in the past 6 months (mean=3.11, Std=1.384). On the other hand, few (40.4%) of the respondents disagreed that they have been living a quality life in the past 6 months (mean=3.08, Std=1.306).

The above findings imply that people’s welfare in terms of dignity has been well catered for in Ngoma District. In other words, respect for the dignity of the people made them feel positive about themselves and encourage them to help others also to live positive quality life. Having dignity implies that a person will have the quality of being honourable, noble, excellent or worthy. With a human regarded as the most supreme living creature, dignity, in its appealing sense, is better referred to as human dignity. It is the conceptual basis for the formulation and execution of human rights and is neither granted by the society nor can it be legitimately granted by the society. An imperative implication of human dignity is that every human being should be regarded as a very invaluable member of the community with a uniquely free expression of their right to life, integrated bodily attributes and their spiritual nature. This implies that in the context of this study, when a person uses water from protected water sources which are safe and clean, that person will have self-worth. Similarly, a household that observes sanitation by having well ventilated pit latrine or flush toilet and a compost for rubbish is regarded as having dignity.

**Qualitative Data on People’s Welfare**

This section captured data from local community members as regard their welfare. The interview mainly focused on health, quality of life, and dignity of the local community in Ngoma District. In the face to face interview with the key informants, the researcher asked this question: “What can you say about your health, is it good or bad, explain?” The researcher gave the summary to the response to the interview question as indicated below:
“.....my health has been weak, may be because I’m old now....i have not been feeling well lately. I have been diagnosed with diabetes and I’m under medication...I’m to go back for more check-ups next week....” (Man, 61 years).

“...hmmm....what can I say now. i don’t know.... but my children have not been ok. I have frequented the hospital with this last born of mine....he keeps having high fever and diarrhoea.....i do not have enough money to take him for better treatment...and the nearby hospital is 59km.. I can’t manage to go there..... (Single mother, 34 years).

“......aaaah, my health has been fine. me I don’t fall sick anyhow.... if i fall sick..., I become ok without going to the hospital or taking medicine....I just become ok like that......(Man, 29 years).

“......i don’t like to fall sick....i take medicine immediately if I fall sick....i think I know how to keep myself healthy because sometimes I run around the compound until I sweat......i just love exercising.....” (Man, 21 years).

“...... right now I’m ok...but sickness can come anytime and you cannot know you get them....once in a while, I can get headache, stomach ache or malaria but when I treat, they go away within one or two days.......” (Woman, 25).

“......for me I know how to eat properly....i read books on diet and i know how to balance my diet.....my health has been good ever since I started eating much greens and fruits three years ago.......” (Woman, age 24 years).

The researcher further asked the local community members who were the target key interview informants the question: “Describe what has been the quality of your life in the recent past till to-date”. Their responses were summarised as below:

“..... I have been good and friendly to different people....my attitude has been good and most of the times I feel happy.....” (Woman, age 22 years).

“.....indeed I have been just like this...I just don’t know the way life is treating us.... sometimes no food, sometimes no money....it’s hard to raise five children......” (Father of five, 41 years).
“......somehow when I harvest my crops and get a good sale, I buy what makes me happy...like fish...or meat...hmmm.... but sometimes drought dries the crops and you can have nothing to sell or eat, so life becomes very hard...” (woman, 35 years).

“......I love going to visit my friends and chart with them and talk about the future, politics, marriage, football and the other things....i feel good with my friends and .....sometimes, I miss them....” (Woman, 20 years).

“......i lost my parents in the genocide when I was only 7 years, so life has never been very easy for me...I could not finish my primary because there was no money.....life is not easy, that’s what I can tell you.....i feel so lonely and downcast....but I must survive anyway....” (Man, 30 years).

“......ever since my children went back to school, I have been feeling peace and having time to relax a bit....I feel free from pressure,.....i am just happy these days........” (Mother of 4, 40 years).

In addition the researcher asked the key interview informants, the question: “Has your dignity ever been violated, if yes, how and why?” Their responses were summarised as below:

“......No, my dignity has never been violated...here we stay as a community of brothers and sisters and we respect each other....we work together and celebrate our successes together.....there is no room for such thing here.....” (Man, 29 years).

“......there are some people here when they get some little money they get excited and violent and can cause problems when they are drunk... they like abusing people and fighting anybody that crosses their path...but the area leaders know how to deal with them........” (Woman, 36 years).

“......me, no one has ever said bad thing about me...because even me I do not say any bad thing to anybody....I just mean my own business....i don’t like to talk bad about people who are not there to hear want I’m saying...its indiscipline.....” (Man, 39 years).

“......respecting people is good....i greet people when I meet them....and they also great me back....and life continues.....in this area, we teach our children to respect leaders, elders and parents....so many people are friendly....” (Man, 46 years).
The above responses imply that the health, the quality of life and dignity of the people of Ngoma district is not very bad. This is because people live in harmony with one another and respect one another and are often peace to a large extent.

### 4.4 Objective three: The Effect of Water and Sanitation Projects on People’s Welfare in Ngoma District

The third objective of this study was to establish the effect of water and sanitation projects on people’s welfare in Ngoma District. The following tables give the summary of the findings.

**Table 4.4: The Effect of Water and Sanitation Projects on People’s Welfare in Ngoma District**

<table>
<thead>
<tr>
<th>Correlations</th>
<th>water and sanitation</th>
<th>Welfare</th>
</tr>
</thead>
<tbody>
<tr>
<td>water and sanitation</td>
<td>Pearson Correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Welfare</td>
<td>Pearson Correlation</td>
<td>Sig. (2-tailed)</td>
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<td></td>
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<td>N</td>
</tr>
</tbody>
</table>

<table>
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<tr>
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<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
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</table>

<table>
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<th>Standardized Coefficients</th>
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<td>Std. Error</td>
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<td>.131</td>
</tr>
<tr>
<td></td>
<td>sanitation facility</td>
<td>.066</td>
</tr>
</tbody>
</table>

a. Dependent Variable: people's welfare  
*** Correlation is significant at the 0.01 level (2-tailed).

The findings presented in table 4.4 revealed a positive, weak but significant relationship between water and sanitation projects and people’s welfare in Ngoma District ($r=.308^{**}$, $p<0.01$). Furthermore, the study found that water and sanitation projects statistically and significantly affects people’s welfare by $0.8\%$ ($R^2=0.008$, $p<0.01$). This rejects the null hypothesis that there is no significant effect of water and sanitation projects on people’s
welfare in Ngoma District and upholds the alternative hypothesis that there is a significant effect of water and sanitation projects on people’s welfare in Ngoma District. This implies that an improvement of water and sanitation services causes an improvement in people’s welfare. However, the effect is very small; this shows that other factors are largely responsible for the variation in peoples’ welfare. Furthermore, the study found that only water facilities could significantly predict the variation in peoples’ welfare in Ngoma District. This is because a unit installation of water facility could cause 11.9% (Beta=0.119) improvement in people’s welfare.
CHAPTER FIVE
DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction
This chapter presents the discussion of the study guided by the study objectives. The discussion was done by exploring the research findings relative to what other researchers in the fields that pertain to the variables have confirmed. The study was later concluded and appropriate recommendations accruing from the findings were made.

5.1 Discussion of Major Findings
5.1.1 The Performance of Water and Sanitation Projects in Ngoma District
The first objective of this study was to assess the performance of water and sanitation projects in Ngoma District. The study found that water and sanitation projects in Ngoma District were fairly satisfactory (overall average mean=3.04, Std=1.285). This is because water and sanitation project have not yet completely captured all parts of the district hence the reason for its fair performance.

Furthermore, it is attributed to the fact that majority of the respondents indicated that they do not treat water with any chemical such as chlorine or anything because they cannot afford it, instead they boil it to make it safe. In addition, most of the respondents still do not have piped water into dwelling, instead they use boreholes and protected spring that is a bit far from the household. This is true because most of the water projects been done in Ngoma District are basically drilling boreholes and setting up protected water spring wells so as to help the community in accessing clean water.

This study is in line with the findings of the Rwanda Demographic and Health Survey (RDHS, 2014/2015) which found that at national level, 73 percent of households have access to an improved source of drinking water. Protected springs were the most common improved source of drinking water used by households (32 percent), followed by public taps/standpipes (27 percent). Only 10 percent of households had running water in their dwelling, yard, or plot. Overall, 27 percent of households used unimproved sources of water, which were considered unhealthy. For example, 14 percent of households were found to use an unprotected spring as a water source, which increased household members’ risk of contracting diarrhea and other waterborne diseases.
Regarding the time spent in round-trip travel to obtain drinking water, RDHS (2014/2015) showed that slightly less than half of households (49 percent) spend 30 minutes or longer to get to the water source and return, and 41 percent spent fewer than 30 minutes. Only 11 percent of households had water on their premises. Fifty-five percent of households in rural areas took 30 minutes or longer to obtain drinking water, as compared with 19 percent of households in urban areas. The proportions of households that spent less than 30 minutes to obtain drinking water varied slightly between rural areas (41 percent) and urban areas (38 percent). With respect to treatment of water prior to drinking, 44 percent of households used an appropriate treatment method prior to drinking, while the other 56 percent did not treat their water prior to drinking. The most common method to treat water prior to drinking was boiling (38 percent), followed by adding bleach/chlorine (5 percent) and using ceramic/sand or another filter (4 percent). Households in rural areas were more likely to drink untreated water (60 percent) than those in urban areas (33 percent).

This study also agrees with that of Prüss-Üstün, et al (2008) which was done in five countries and found that the percentage of operational water supply facilities had increased with support from the programmes over the years. Eighty to ninety percent of the water supply facilities under review were operational at the time of the studies, some of which were evaluated many years after the water supplies had been installed. The high percentage was explained by varying factors such as management of facilities by motivated community level organisations of water users; strong community leadership; dependence of communities on the water source; the water supply facilities still being new; and rehabilitation of broken facilities by the government with donor assistance.

As regard sanitation facilities, the findings revealed that sanitation facilities used by the households of Ngoma District was assessed by respondents as fairly satisfactory (average mean=3.04, Std=1.285). This was attributed to the fact that most of the households in Ngoma District still throw their rubbish in bushes instead of composts. A good number of the households have pit latrines, though there are some households that do not have toilet facilities; only a few of them have flush toilet system.

This study agrees with that of RDHS (2014/2015) which found that 54 percent of households had access to an improved, unshared toilet facility (57 percent in rural areas and 42 percent in urban areas). Only 1 percent of households had toilets that flush to a piped sewer system, while 4 percent used a ventilated improved pit (VIP) latrine. However, almost half of
households (48 percent) used unshared pit latrines with a slab. These toilets were considerably more common in rural households than urban households (52 percent and 30 percent, respectively). Seventeen percent of Rwandan households use a toilet facility that would be considered improved except that it is shared with other households; most of these facilities are pit latrines with slabs (15 percent).

This study is also in line with the findings of the UNDP (2011) that found that the percentage of the world’s population using an adequate toilet rose just 7% from 1990 to 2008, from 54 to 61%. Almost half the population in developing regions did not have access to sanitary facilities, and an estimated 1.1 billion people practise open defecation, exposing themselves and their communities to major health risks. In sub-Saharan Africa, only 24% of the rural population were using an improved sanitation facility (UNDP, 2011).

5.1.2 The Welfare of the People of Ngoma District

The second objective of this study was to assess the welfare of the people of Ngoma District. The findings revealed that people’s welfare was satisfactory (overall average mean=3.70, Std=1.149). This was attributed to the satisfactory health, quality of life and dignity of the people of Ngoma District.

In regard to health, the study found that it was satisfactory (average mean=3.37, Std=1.242). This was attributed to the fact that the people indicated that they had positive emotions, inspirational to others, were in control of their lives and practiced right diets. This could have been because they had good sanitation because of having pit latrines, and having access to safe and clean water from protected springs and boreholes.

This study agrees with that of WHO (2006) which found that good health is attributed to positive concept, emphasizing social and personal resources, as well as physical capabilities. WHO (2006) adds that mental, intellectual, emotional and social health helps a person to handle stress, to acquire skills, to maintain relationships, all of which form resources for resiliency and independent living.

In regard to quality of life, it was found to be satisfactory (average mean=3.92, Std=1.019). This was attributed to the fact that most people had positive attitude towards life because most of them attributed happiness, peaceful and calm. In other words, these people are
satisfied with life’s offers, including everything from physical, health, family, and the environment. They are not stressed and suppressed with diseases.

This study agrees with that of Derek et al. (2009) who found that the standard indicators of the quality of life include not only wealth and employment, but also physical and mental health, education, recreation and leisure time, and social belonging. On the other hand, WHO (2006) found that quality of life is the individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals.

In regard to dignity, the study found it to be satisfactory (average mean=3.52, Std=1.185). This was attributed to the fact that most people felt they were respected by their community members, and this made them feel positive about themselves and encourage them to help others also to live positive quality life. Having dignity implies that a person will have the quality of being honourable, noble, excellent or worthy. With a human regarded as the most supreme living creature, dignity, in its appealing sense, is better referred to as human dignity. It is the conceptual basis for the formulation and execution of human rights and is neither granted by the society nor can it be legitimately granted by the society. An imperative implication of human dignity is that every human being should be regarded as a very invaluable member of the community with a uniquely free expression of their right to life, integrated bodily attributes and their spiritual nature. This implies that in the context of this study, when a person uses water from protected water sources which are safe and clean, that person will have self-worth. Similarly, a household that observes sanitation by having well ventilated pit latrine or flush toilet and a compost for rubbish is regarded as having dignity.

This study agrees with that of Sensen (2011) who found that dignity is important because it allows individuals and groups to feel respected, valued and connected with others around them. Dignity and respect are considered basic human rights, and both help people feel a sense of worthiness and importance. Dignity involves a mutual effort among people to listen, understand opinions and values and include one another in conversations. Treating people with dignity is an important practice in daily life. However, it can be overlooked in certain situations, such as when providing healthcare to elderly and disabled patients as well as when performing medical treatments on people of different races, socioeconomic statuses and ethnic identities. Showing dignity involves listening to and acknowledging concerns, making people feel their opinions are valued and speaking to them on an equal level.
Simpson-Hébert et al. (2012) also found that improvements in sanitation will improve privacy and retain human dignity — significant and legitimate social development concerns. These less quantifiable benefits are among the advantages of water supply and sanitation most often reported by people in low-income communities.

5.1.3 The Effect of Water and Sanitation Projects on People’s Welfare in Ngoma District

The third objective of this study was to establish the effect of water and sanitation projects on people’s welfare in Ngoma District. The findings revealed a positive and significant correlation between water and sanitation projects and people’s welfare in Ngoma District \((r=0.308^{**}, \ p<0.01)\). This implies that there is a significant effect of water and sanitation projects on people’s welfare in Ngoma District, hence upholding the alternative hypothesis and rejecting the null hypothesis. In other words, an improvement of water and sanitation services causes an improvement in people’s welfare.

This study is in line with that of Esrey (2012) who found that in 144 epidemiological studies that he had reviewed, the health impact of improved water supply and sanitation facilities was high, measured by significant reductions in morbidity rates (sickness) and higher child survival rates. Improving the health of the poor is a frequently cited goal of water and sanitation projects. The relationship is difficult to establish in practice at the project level, but over the longer term it can be demonstrated that there are significant health-associated benefits from improvements in water supply and sanitation provision, particularly when these are associated with changes in hygiene behaviour.

5.2 Conclusion

From the findings in the preceding sections, the following conclusions are made:

- Water and sanitation projects are fairly performing in Ngoma District.
- The welfare of the people of Ngoma District is satisfactory to a fair extent.
- Water and sanitation projects have a weak effect on the welfare of the people of Ngoma District.

This implies that having proper water and sanitation facilities through different projects can help promote access to clean and safe water and proper sanitary establishment which will help improve people’s welfare. This is because, a household with better water and sanitary facilities will enable them to be dignified, have quality life and good health.
5.3 Recommendations

Given the findings and conclusions drawn, the following recommendations are made thereof:

Objective one:

The government with the help of the local leaders should identify the most affected villages and construct protected springs and boreholes for them so that they can access safe, clean and cheap water within a few minutes from their homes.

Similarly, the government of Rwanda through the ministry of natural resources with the support of local government leadership and technocrats should educate the local masses on the importance of having latrines and rubbish bins in their homes so as to make sure every family promotes good hygiene and sanitation. The education can be achieved through mainstream media talk shows, seminars, workshops, and training programs at various levels, starting from village to the district level.

Furthermore, projects managers, and donors should involve the participation of the local masses in the different phases of the water and sanitation projects. This will help in the identification of problems and challenges at an earlier stage before it is too late.

Objective two:

There is need for the government, NGOs and well-wishers to educate the masses about the importance of treating or boiling water before it can be used. The education can be done in schools, starting from primary up to tertiary/university level. At the village level, the education can be done through village meetings, and radio programs. This will help solve cases of illness related to water borne diseases and keep them to live healthy.

Furthermore, in order for the local masses to have better welfare, the local leaders, the business community and the government should encourage them to involve themselves in viable economic activities by borrowing loans from microfinances and Savings and Credit Cooperative (SACCO) groups. This will help empower them socially and economically.

Objective three:

The local leaders should make sanitation and hygiene practices a compulsory at the village, sector and district level where women are trained in community, economic and health issues affecting the household. This practice can be achieved by penalizing households that are
found without pit latrines, or rubbish bins. The training can be done by participants from the ministry of health on various topics such as boiling drinking water, proper waste disposal methods, general cleanliness of the house, compound, plates, cups, clothes, saucepans etc.

There is need for NGOs and the district leaders to carry out research into appropriate and cheap technologies, aiming at a large-scale transition from traditional to hygienic latrines at affordable cost to households. That is, instead of using wood as the latrine floor, slabs can be used as well as proper ventilation.

In addition, policy makers should come up with policies that make more effective use of existing knowledge about the impacts and effectiveness of rural water supply, sanitation and hygiene interventions – for example, information about the risk of limited impact on health if investments are only made in communal water supply facilities without effectively improving hygiene and sanitation conditions in households. Furthermore, more context-specific knowledge also needs to be built in various fields, such as solutions for affordable basic sanitation in poor rural areas; the upgrading of simple latrines to make them sanitary; marketing of affordable sanitation solutions for poor households and communities through the local private sector; and means of disposal, treatment and productive use of human waste.

5.4 Areas for Future Studies
This assessment was done only in Ngoma District; there is need for the study to cover all the districts in the Eastern province of Rwanda for the results to permit generalization.

There is need for future study to be done on the involvement of the local community in water and sanitation projects and its impact on people’s welfare.
References


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APPENDIX I: QUESTIONNAIRE

I am a Master’s candidate in Project Planning and Management at Kampala International University Uganda undertaking a dissertation on “Water and Sanitation Projects and Peoples’ Welfare in Ngoma District, Rwanda”. In view of this, I request you to participate in this study. Kindly answer this questionnaire without leaving any question unanswered. Please be assured that the information you give will be treated with utmost confidentiality and will be used for academic purpose only.

Before answering this questionnaire kindly read and sign the attached informed consent.

Thank you very much in advance.

Yours faithfully

……………………..

Mudahemuka William
APPENDIX II: INFORMED CONSENT

I am giving my consent to be part of the research study of Mudahemuka William which focuses on Water and Sanitation Projects and Peoples’ Welfare in Ngoma District, Rwanda.

I am assured of privacy, anonymity and confidentiality and that I will be given an option to refuse participation and right to withdraw my participation any time.

I have been informed that the research is voluntary and that the result will be given to me if I ask for it.

Initial: ________________________________ Date: ___________________________
SECTION A: GENERAL INFORMATION

Please kindly indicate by ticking [✓] the option that describes your profile.

1. What is your gender?
   a) Male [ ]
   b) Female [ ]

2. What is your age?
   a) 20-29 years [ ]
   b) 30-39 years [ ]
   c) 40-49 years [ ]
   d) Above 50 years [ ]

3. What is your level of education?
   a) None [ ]
   b) Primary [ ]
   c) Secondary [ ]
   d) University [ ]

4. How many members do you have in your household?
   a) 1-3 [ ]
   b) 3-6 [ ]
   c) More than 6 [ ]
APPENDIX III: INTERVIEW GUIDE

Interview with the project managers, donors and local leaders only

1. Which water and sanitation projects have been successfully completed and implemented in this district?
2. What are the benefits of the water and sanitation projects to the people of Ngoma District?
3. What challenges have these projects been meeting in the past 2 years in Ngoma District?
4. What can you say about your health, is it good or bad, explain?
5. Describe what has been the quality of your life in the recent past till to-date.
6. Has your dignity ever been violated, if yes, how and why?

The End
APPENDIX IV: MAP OF NGOMA DISTRICT