

**ASSESSMENT OF HOUSEHOLD WATER SERVICES ACCESSIBILITY IN
KARATU DISTRICT TANZANIA: A CASE OF WORLD VISION DREAM
VILLAGE WASH PROJECT**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
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ABSTRACT

The study aimed at assessing household water service accessibility in Karatu District Tanzania, a case of world vision dream village WASH project. Specifically, the study wanted to establish the level of access to water services before and after the dream village WASH project, to assess community involvement in dream village WASH project, and to determine household water users' opinions on dream village WASH project. The study adopted both quantitative and qualitative research approaches, whereby a descriptive social survey research design was involved. Data were collected from 120 household water users from three villages (Mbuganyekundu, Jobaj, and Dumbekhand) and 10 key informants. Questionnaire, interview, and FGDs were used in data collection. Inferential analysis was involved in establishing the relationship between independent (intervention, community involvement and water users' opinions) and dependent variables (access to water services). Qualitative analysis involved content analysis. The findings show that before the project, people used to walk for more than 4 kilometres to find water and they used unprotected water sources, but after the project the level of access to water improved and the distance from households to the water points was reduced. The findings also indicate that the community was involved in stages of implementing the project and community had positive opinion on the project. The study also found the statistical significant level ($p \leq 0.05$) between independent (intervention, community involvement and water users' opinions) and dependent variable (access to water services). The study conclude that, there is improved level of access to water services, community involvement in water service project and household water users' opinion in water services may influence accessibility of water services among the households.

DECLARATION

I, **DOREEN CHARLES MOWO**, do declare to the Senate of Sokoine University of Agriculture that, this dissertation is my own original work done within the period of registration and that it has neither been submitted nor being concurrently submitted in any other institution.

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Date

The above declaration is confirmed

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Date

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LIST OF ABBREVIATIONS

ADP	Area Development Programme
CBO's	Community Based Organization
DVP	Dream Village Project
FBO's	Faith Based Organization
FGD's	Focus Group Discussion
NBS	National Bureau of Statistics
NGO's	Non-Governmental Organization
SDG's	Sustainable development Goals
SIDO	Small Industry Development Organization
SPSS	Statistical Package for Social Science
UN	United Nations
UNDP	United Nations Development Program
UNICEF	United Nations Children's Education Fund
URT	United Republic of Tanzania
WHO	World Health Organization
WVT	World Vision Tanzania

CHAPTER ONE

1.0 INTRODUCTION

This study assessed household access to water service in Karatu District in Tanzania. This chapter presents background of the study, statement of the problem, general objective, specific objectives, research questions, and significance of the study.

1.1 Background Information

Water access is a basic need of humans and when well utilised it leads to socio-economic development (Hove and Tirimboi, 2011). Approximately 844 million people worldwide lacked access to safe water in 2015 (WHO, 2017). Water services can be provided by the government and the Non-Governmental Organisations (NGOs). Inadequate access to water leads to poverty and poor health if serious interventions are not taken. A study by Graham (2016) found that more than 90 percent of households in rural areas in thirteen countries among the twenty-four being studied lack access to water on their premises. Poor access to water is a major problem affecting human development especially in developing countries. Water and sanitation were recognised by the United Nations General Assembly and United Nations Human Rights Council as a human right in 2010 and which should be addressed through progressive realisation of universal access to sufficient, safe, physically accessible, and affordable water (Kayser, 2013).

Among the Sustainable Development Goals (SDGs), goal number six aims at providing clean water and sanitation for all at all ages by 2030 (UN, 2015; Cobbinah *et al.*, 2011). In order to achieve the SDGs there is a need for valuing water as an important and valuable resource (Garrick *et al.*, 2017). In this study, indicators of access to water services include water quantity, reduction of workload, improvement of health, saving

time, improvement of child school attendance, and improvement of participation in other income generating activities. The efforts of ensuring access to water have been successful mostly in the developed countries, while the majority of the population in the developing countries are without access to water services (Wesselink, 2015; Osei, 2015; Montgomery *et al.*, 2009). Since water is a basic need of human beings, poor access to water may cause people to search for other means that are most likely involve unprotected sources.

Globally, women and girls are responsible for water collection by 75 percent in the community and spend around 40 hours every month collecting water from distant water sources (Michel, 2019; Sorenson and Morssink, 2011). Fetching water from distance sources has negative effect on human health as it may lead to fatigue, spinal pain and damage of small tissues within the body (Fry *et al.*, 2010; Geere *et al.*, 2010). As reported by Michel (2019), the effects of children fetching water for long distances cause poor attendance in school. Furthermore lack of access to water has socio-economic impacts, particularly for women and girls (UNDP, 2016).

In Tanzania, the National Water Policy of 2002 set a goal of providing clean and safe water to the population within 400 meters from the households (URT, 2002). According to the National Water Plan 2016-2021, monitoring results indicate that the water access and quality have improved substantially in recent years. Nevertheless, additional policy efforts are required for more improvement of access to quality and safe water in rural areas.

As it has been stipulated in the Water Sector Development Strategy 2006-2015, the impact of low supply coverage falls primarily on the poor. Many fetches water from long distances or end up paying high prices to water venders for small quantities of water and often of poor quality. The low supply water coverage in rural areas manifests itself in low agricultural production and poor quality of life (URT, 2008).

World vision Tanzania (WVT) as one of the leading Non-Governmental Organisations (NGO's) in the world has contributed to improved community wellbeing in rural areas through different projects such as livelihood projects, child sponsorship, health, water hygiene, sanitation and advocacy projects. However, this organisation believes that sustainable development occurs when there are resilient economic and social development ecosystems that sustain the well-being of children and families (WVT, 2016).

The organisation also assists the communities in the areas where its activities are implemented through Area Development Programmes (ADPs). Through the ADPs, the organisation offers varieties of assistance in agriculture, irrigation schemes, and livestock keeping with the aim of reducing poverty (Mwendi, 2013). However, the program is implemented in line with the scope of the organisation, to fight poverty through intervening in agriculture, water, education, health, and small income generating activities (Mwendi, 2013).

The study specifically dealt with one project that is Dream Village WASH project in Karatu District operated by WVT. Dream Village WASH Project (DVP) is a three years special funded project that is located in Eyasi Division within Karatu District, Arusha region and it covers three villages namely Jobaj, Dumechand, and Mbuganyekundu. The project goal was to improve social economic status of the three villages through improved health, quality education, and access to clean and safe water (WASH project) by 2019 (WVT, 2016). The project area is a semi-arid with short periods of rains ranging from November to March with crop farming (paddy, onions, maize and beans) and animal keeping as major economic activities.

The project has the following partners Karatu District Council, Community Based Organisation (CBO), Save the Children, Kilimo Trust, Faith Based Organisation (FBOs),

Small Industry Development Organisation (SIDO), and Vision Fund Tanzania (VFT). The project is in line with the National Water Policy of 2003, The Water Resources Management Act No. 11 of 2009, and the Environmental Management (Water Quality Standards) Regulations, 2007.

1.2 Problem Statement

The supply of clean and safe water is still a major problem in developing countries including Tanzania (Jiménez and Pérez-Foguet, 2010). A poorly defined service standard, lack of assets security and limited financial security are reported as the main reason for poor water supply (Al’Afghani and Kohlitz, 2019). According to Kimambo *et al.* (2003), domestic water supply has been a sink for the little resources that the poor household have. Many rural areas are reported to have poor water services coverage of 48 per cent (World Bank, 2018). The coverage of water services in urban areas in Tanzania is relatively better, where about 60 per cent have access to improved water sources (World Bank, 2017). In Baray ward, the supply of water services is generally poor. Thus, the majority of households in the selected three villages are extremely poor and with no access to safe drinking water (World Vision, 2016).

Despite that NGOs as a new anti-poverty strategy have been adopted in Tanzania since 2001 to fight against poverty, access to water service in households is still constrained by such factors as lack of drop points, long time spent due walking long distance searching for water, and unaffordable water prices (Kasogela, 2016). However, the water projects have not involved effectively the communities in managing water projects (Kasogela, 2016).

To address these problems, WVT, through Area Development Programs (ADPs) introduced the Dream Village WASH project, which is implemented in three villages (Mbuganyekundu, Jobaj, and Dumbechand) of Baray Ward in Karatu District.

These three villages experience severe shortage of clean and safe water for domestic uses, irrigation, and animal uses (WWT). Women also spend up to 5 hours walking more than 10 km every day to fetch water, which in most cases is not safe. Therefore, though NGOs have been trying to improve access of safe and clean water since 2001, the problem persists. This study specifically assesses the performance of Dream Village WASH under WWT, in addressing access to water service among households in three villages of Karatu District.

1.3 Justification of the Study

The findings from this study would contribute to local empirical evidence and towards the implementation of the Tanzania National Water Policy of 2002 and the 2009 Water and Sanitation Act No 12 whose objective is to promote and ensure that every person in Tanzania has the right of access to efficient, effective and sustainable water supply and sanitation services (URT, 2012). The findings would also contribute the generation of useful information on the level of water access in rural areas of Tanzania. They would also be useful assessing the Tanzania Development Vision 2025 which aims at attaining universal access to water supply services in urban areas by 2025 and covering at least 90 per cent of the population with water supply services in the rural areas by 2025 (URT, 2012).

The study is also important and timely because it provides recommendations to local practitioners as NGOs on how they can improve water services in the area, and how they can advise the government on improving water policies. Moreover, the findings could be used to improve water projects in other districts; and hence, providing strategies applied by WWT in the selected three villages of Karatu District, which could be also used by other NGOs in different parts of Tanzania.

1.4 Objectives of the Study

1.4.1 General objective

The general objective of this study was to assess of household water services accessibility in three villages (Jobaj, Dumbekhand and Mbuganyekundu) under dream village WASH project in Karatu Tanzania.

1.4.2 Specific objectives

Specifically, this study intended to:

- i. To establish the level of access to water services before and after the intervention of dream village WASH project.
- ii. To assess community involvement in dream village WASH project.
- iii. To determine water user opinion on dream village WASH project in the study area.

1.5 Research Questions

This study guided by the following questions

- i. What are the changes brought in access of water service by the implementation of dream village WASH project in the study area?
- ii. How community is involved to participate in dream village WASH project?
- iii. What is the household water users' opinion regarding dream village WASH project.

1.6 Research Hypothesises

This study was guided with the following hypothesis:

- *H1: The water access to community has been improved after the intervention of dream village WASH project compared to the situation before.*
- *H2: The community involvement in water project increases access to water users.*

- *H3: The opinion of water users on dream village WASH project affects water access to community in the study area.*

CHAPTER TWO

LITERATURE REVIEW

2.0 An Overview

This chapter explores the related literature and cases in relation to households' access of safe and clean water. The aim is to establish appropriate base information that contributes to the understanding of the topic under study. The chapter also comprises the theoretical and empirical reviews.

2.2 Definition of Key Terms

2.2.1 Household

According to Willekens (2016), a household is a group of people that co-reside and share some resources. In addition, a household consists of a number of persons who share a housing unit or part of a housing unit and share food and possibly other essentials for living. A household may be comprised a family, which refers to household members that are related by marriage and parents and children that are related by blood or adoption (Willekens, 2016). Additionally, a household may consist of a single family, several families, or unrelated persons. However, the definition of a household varies in time and across countries; in this study, the word "household" is used to refer to a group of persons who live together in the same compound, get food together, and sleep in the same house or compound.

2.2.2 Water services

Mason *et al.* (2016) consider water service as a form of service provision to community specifically designed to alleviate the barriers that water consumers can face within the community. Water service could be provided to community by public utilities, commercial organizations, community, or individuals, through putting system of pumps and/or pipes. Therefore, water services comprise a set of technological, financial, and organizational measures employed by utilities to service water provision (Mason *et al.*, 2016). In this study, “water service” is used to refer to systems of water service, which is by public utilities, organizations, or individuals for improving access of clean and safe water among water users particularly households.

2.2.2 Water Project

Project is a series of activities that are to be accomplished within a certain given period. Water project can simply be defined as making an area surrounded by water more useful to the surrounding society. According to Sara (2005), a comprehensive, sustainable water project consists of costs, time, commitment, investment in people in order to realise the main objective of solving water crisis. For a small investment, you can fund reliable water projects that serve villages and schools. Sources of water collection could be wells, dams, and rain catchment systems that can provide a reliable source of drinking water as well as water for other domestic uses in our homes.

WVT water project interventions mainly focused on extension of Jobaj borehole, which was drilled by the World Bank in 2009 through installation of submersible pump, construction of pump house, construction of pumping mainline, construction of storage tank and distribution line with several water points covering the three villages.

2.3 Household Access to Water Service

World Health Organization defines access to water in terms of distance and time spent in fetching water (WHO, 2003). According to the Water Policy of 2002, water could be said accessible to households, when water consumers in the household get water within 400 meters, do not spend more than 30 minutes in fetching water, and get water with affordable price.

In most cases women and young girls are the most affected group as they are the ones responsible for performing domestic activities such as fetching water, cooking, and fetching firewood, just to mention a few. Inadequate access to water affects people in several aspects such as health whereby the most affected are children. Each day, nearly one thousands children die of preventable water and sanitation-related waterborne diseases such as diarrhoea (UNDP, 2016; Kondracki and Wellman, 2002). WASH programme among the communities may be the source of improved child health that is mostly prone to the effects of environment contamination (Cumming and Curtis, 2018).

In education, girls are mostly affected as they fail to attend school in time because of long walking distances searching for water; hence, lowering their school performance. Moreover, water scarcity causes conflicts among community members thus hindering agricultural and economic growth (WHO, 2012). A study by Irianti *et al.* (2016) revealed that limited access to safe and clean water in Indonesia has affected the socio-economic of the households and suggested for the expansion of water pipes to enable the rural communities have access to safe drinking water. One of the main activities of the dream village project is to expand the water pipe from Jobaj village to other neighbouring villages to enable them have access to both clean and safe water. WVT evaluation report

conducted in 2017 revealed that about 73 percent of the population from the three villages can now easily access water within a distance of 400 m as per the National water policy.

2.4 Community Involvement in Water Projects

A community is involved in water projects when individuals, families, or communities assume the responsibility for local water problems and develop the capacity of contributing to their own water projects development (Kasogela, 2016). It is an active process whereby the beneficiaries influence the direction and execution of development projects rather than being receivers of a share of the project's benefits. It is also very important to note that, community involvement creates an enabling environment for accessibility by allowing users not only to select the level of services for which they are willing to pay, but also to make choices and commit resources in supporting the choices made by the community (Kasogela, 2016).

Moreover, community involvement in water projects is termed as a new direction towards service provision and maintenance. Involvement is often aimed at assisting stakeholders of water projects to ensure populism, organizational and management capacities of the key institutions in which the support can be given (Husman, 2011). It is worth noting that, community involvement in water projects allows people to play a critical decision-making, resource allocation, and organisation formation that lead to water accessibility (Kasogela, 2016). However, the idea that communities should be actively involved in the provision of water services has become widely recognised as critical to the long-term sustainability of any water service system (Kasogela, 2016).

According to Blessing *et al.* (2016), the process of involving communities in water projects through participatory approach is most important towards enabling the

communities help themselves and sustain the efforts in developing work. Communities are no longer seen as recipients of development programmes but rather as critical stakeholders that have an important role to play in the management of programmes and projects in their areas (Tantoh, 2016). Therefore their participation in the project is an important factor that would lead to project effectiveness as it creates in them a sense of ownership (Harvey and Reed, 2006 as cited by Kyamani, 2013; Rosenqvist *et al.*, 2016). A project is said to be successful when it achieves its objectives and meets the expectations of the stakeholders (Sandra, 2016).

In 1995, Narayan established indicators of community involvement in water service projects (Husman, 2011; and Kasogela, 2016). The identified indicators include Participation in decision; Community contribution, Representation, Responsibility, Authority, and Control, each of these are briefly explained in the subsequent sub sections as follows.

Participation in decision: all aspects related to projects development and implementation has to be based on community preferences. The community has to communicate their needs and decide what the best is for them. Issues such as project design, community contributions, external assistance, and user fees or tariffs have to be decided upon the community or beneficiaries of the project.

Community contribution: community should willingly contribute to the development and operation of the project as the owner of the project. Contribution may be through monetary investment, material equipment, labour and other in kind contributions.

Representation: water service managers should represent the diversity within the community. Women representation as an important group should be clear.

Responsibility: the community should be ready to take on the ownership and attend obligations of the project. To make it clear, they should understand that the projects belong to them and their survival or collapse depends on community investment in terms of human, physical, or financial capital.

Authority: the community has a legitimate right to make decisions regarding the project on behalf of the users. Interference from the donor or government should be minimal and should occur only when is requested by the community or when the intervention is in the interests of the beneficiaries.

Control: the community is able to carry out major decisions and determine the outcome of the decisions. Donors or government should be involved in decision making through consultation.

However, these indicators may not be exhaustive and may mean different things to different authors, but represent the fundamentals of community involvement for demand responsive water service projects. These indicators not only create a sense of community ownership but also self-reliance within communities and strengthen community organizational and management skills mobilise resources from all stakeholders and help to determine the long-run accessibility of the project.

2.5 Community Perceptions towards Water Service Projects

According to Thoradeniya (2015), community acceptance of water service projects depends on the perceptions they form which are mostly built on physical characteristics of the project itself. However, community perceptions can also determine accessibility of the project, because people may perceive positively when the accessibility is very clear. Moreover, negative perceptions may arise if the project never helps households to access

water service effectively (Thoradeniya, 2015). It is also important to note that sometimes people may perceive poorly functioning water service system positively, because they consider it as being better than what they had before (Katz, 2017).

Accordingly, community perceptions are bound to change with the changes of such factors, some of which base on scientific knowledge while others are not. Community perceptions to water accessibility based on scientific knowledge may be guided with the contents found in the supplied water, if they are safe to use for domestic purpose or not; however, non-scientific perception may include only availability of water nearly to community (Thoradeniya, 2015). According to Katz (2017), the perceived water accessibility by communities may be determined by different indicators such as water cleanness or otherwise, willingness to pay, water project ownership, functioning of the system and sources of funds for the project repair.

2.6 Challenges Facing the Implementation of Development Project

In the process of supplying water services, there are several challenges that may occur; failure to overcome the challenges may be a limitation for the project to achieve its goals (Whittington, *et al.*, 2009). Some of the challenges against the implementation of development project include poor risk management; risk management is a critical process and the best practice for effective project management. Others challenges include lack of project management training, poor participation of stakeholders, unskilled personnel, conflicts, political interference, and government policies (Boudet *et al.*, 2011; Petersen-Perlman *et al.*, 2017; PMI, 2013). In order to overcome these challenges there is a need of proper planning before implementation of the project in the specific area.

2.7 Water Hygiene and Sanitation (WASH)

Water is one of the scarce resources in the world. Water is a natural resource, which is fundamental to life, livelihood, food security, and sustainable development (Ministry of Water Resources, 2012). According to studies (WHO and UNICEF, 2014; Chatterley *et al.*, 2013; Van Dijk, 2008) sanitation is a concept of provisioning facilities and services for safe disposal of human excreta, maintenance of proper hygienic conditions by sustainable collection of solid waste and treatment of wastewater. Water Sanitation and hygiene is prioritised and is seen as one of the basic strategies towards the achievement of Millennium Development Goals (MDGs) (Kvarnström *et al.*, 2011).

2.8 Area Development Programme (ADP)

An area development programme (ADP) is a 10 – 15-year community development program that is an integrated approach to community development, emphasizing on community participation, ownership and sustainability, while addressing the macro and micro causes of poverty to achieve sustainable wellbeing of children and the community at large (World Vision Tanzania 2016). The project covers three villages namely, Dumbechand, Mbuganyekundu and Jobaj within the Lake Eyasi Area Programme (AP) which is 45 km from Karatu town as shown in Figure1.

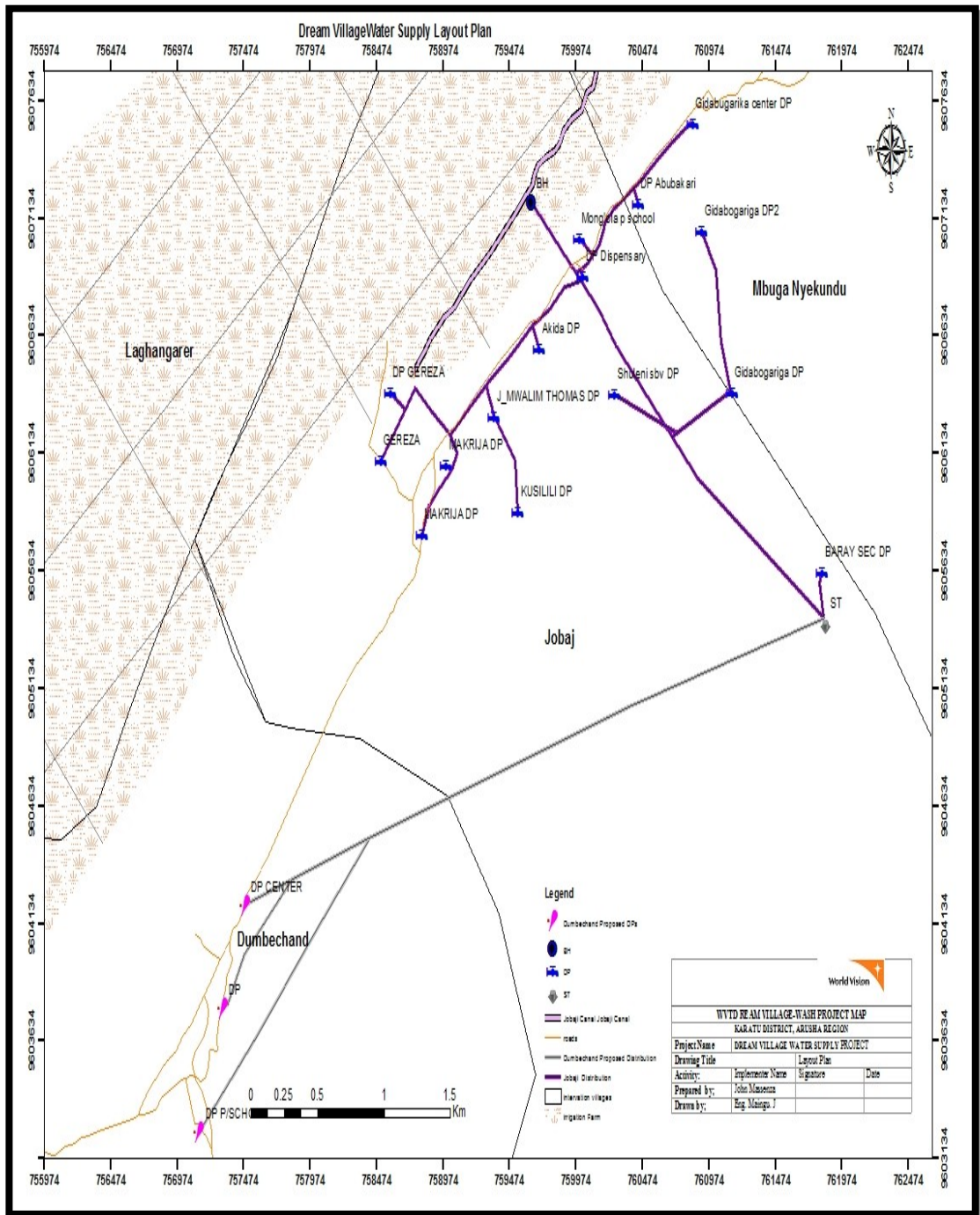


Figure 1: A map showing the wash project in the three villages

Source: World Vision Tanzania (2016)

2.9 Theoretical Review

2.9.1 Programme theory

Programme theories can be defined as a set of assumptions of programme designers (or other actors involved) that explain how they expect the intervention to achieve its

objective (Mukumbang *et al.*, 2016). Program theory modelling uses three components to describe the program: the program activities or inputs, the intended outcomes or outputs, and the mechanisms through which the intended outcomes are achieved. Critical inputs define the components of the program, describe how these components are delivered, define the strength or amount of treatment required to induce the outcome, and outline the required aspects, which are vital in generating the expected outcomes. The processes that the outcome is contingent upon and that follow the inputs should be described (Sharpe, 2011).

Some authors argue that Programme theory is not mostly applied in real life program contexts and that the scope of different social science theories may make it difficult for practitioners to determine how the principle of the theory affect programming decisions (Finney and Moos, 1992). However, programme theory encompasses the assumptions and perspectives of the programme designers and implementers. The theory is assumed to underlie a particular intervention. This process then leads to a better understanding of how, what to expect, and under what circumstances the programme works (Shepherd, 2011).

This theory was very applicable to this study because it states about the inputs or intervention activities and its perceived outcomes. The initiated water project by WWT, known as dream village WASH may be termed as the intervention, whereby, accessibility to water services, which has been assessed in this study, is termed as the outcomes. Therefore, this theory is very essential in this study, hence it helped the research to develop specific tools for the assessment based on programme inputs and outcomes.

2.10 Conceptual Framework

Conceptual Framework shows the interlinked concepts that provide a comprehensive understanding of a phenomenon (Yosef, 2009). In the conceptual framework (Figure 2)

accessibility to water service (dependent variable) was presumed to be the product of the following independent variables, namely, level of access to water services, Community involvement, and Community opinions. Each of these variables is explained as follows.

Level of access to water services: the conceptual framework pre-supposed that, in order for the water users to recognise accessibility of water services they would look at the level of access to water services using such indicators as sources of water, the time spent to fetch water, and distance from household to the water point.

Community involvement: however, the conceptual framework also describes community involvement in water projects as a determinant of accessibility to water service. Indicators for community involvement include decision-making, community contribution, representation, authority, and control over water projects.

Community opinions: according to the conceptual framework the perceived accessibility to water project can also influence access to water services. When water users in a household have a positive perception to water project, then there is access to water service, but if they get negative opinions, it means there is no accessibility to water services. Indicators used to measure community opinion in this study include reduced risks of diseases reduced work load, increased income generating activities, improved child school attendance, saving time, reduced conflict, and reduced risk while searching for water.

Participants' background information is also indicated in the conceptual framework as the main socio-factor, which may be used to determine attitude and participants' opinions towards dream village WASH project and access to safe and clean water. Lastly, dependent variable, that is access to water service and its indicators have been illustrated as the last term that depends on the availability of all mentioned variables. Its indicators

include affordable price, short distance from water points to households, increased water points, and reduced conflicts over water.

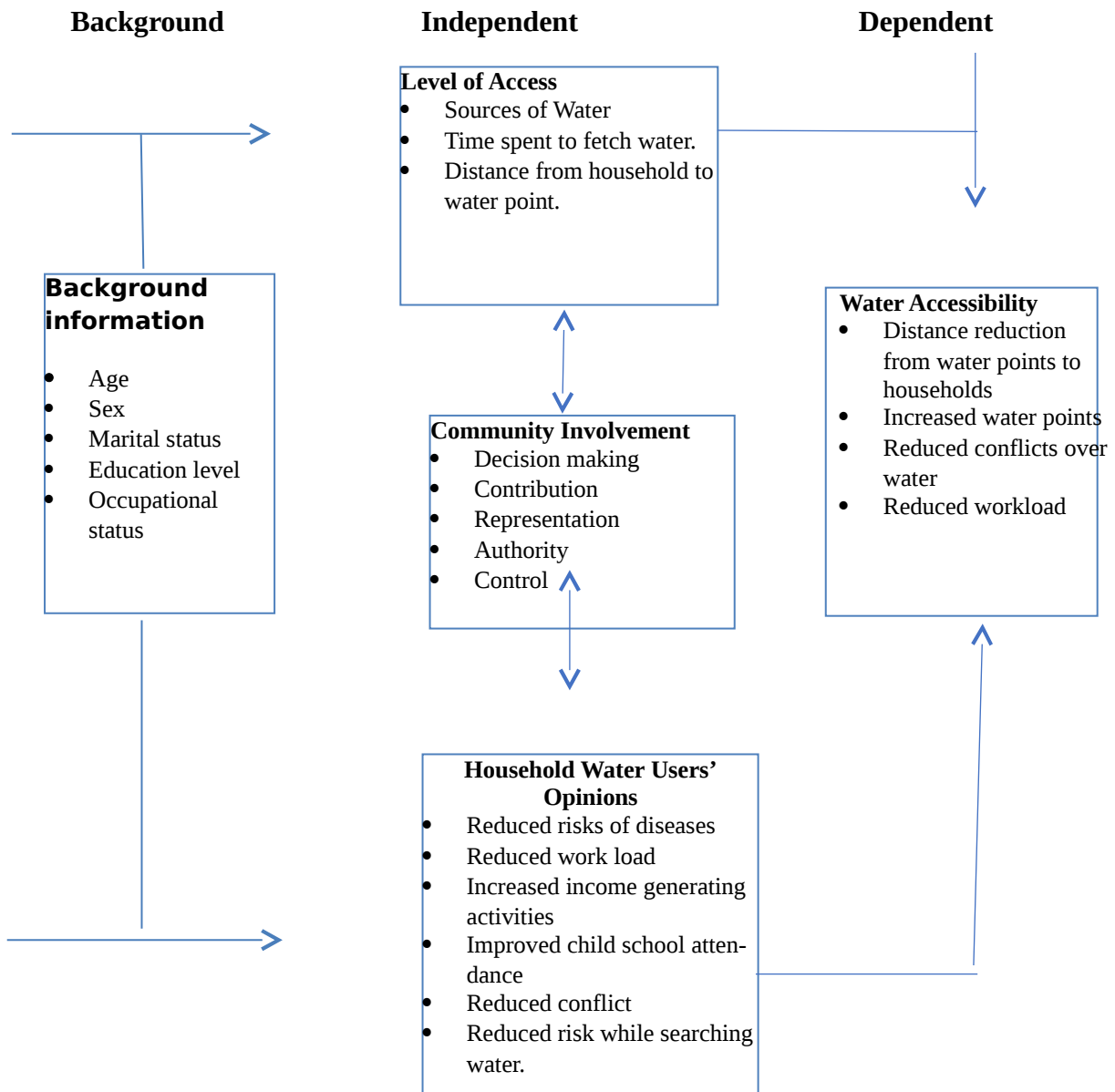


Figure 2: Conceptual framework showing accessibility of water services under dream village project

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methods that were employed in the study. It includes research design, research approach, and geographical area. The chapter also presents the population sample size, sampling techniques, instruments of data collection, and data analysis techniques.

3.2 Description of the Study Area

The study was conducted in Baray ward, where the three villages were included in the study area. The included villages were; Mbuganyekundu, Jobaj, and Dumbechand. These three villages were included because they are found in the area of which the project under study is implemented.

3.3 Research Design

The research design opted in this study was a descriptive social survey design. The survey design was used to collect precise information concerning the subject. This type of research design is considered as a process whereby quantitative facts are collected about social aspects of community's composition activities. This design was also employed in this study because it allows the collection of information by probing for information from the people through either interviews or questionnaire.

3.4 Study population and sampling framework

3.4.1 Study population

The population in this study comprised of water users from three villages (Mbuganyekundu, Jobaj, and Dumbechand), village water users' committee team, and dream village WASH project staff. The water users had been considered in this study because they are the beneficiaries of the implemented project. The village water users' committee team was included in the population because it is the main organ for

organizing and strengthening waters users for the project implementation. The dream village WASH project staffs were important this study because they were the project managers.

3.4.2 Sampling framework

This study included a sample size of 130 participants, whereby 40 were water users from Mbuganyekundu village, 40 were water users from Jobaj village, 40 were water users from Dumbechand village, 6 were village water users' committee members (2 participants from each village) and 4 were dream village WASH project initiators. The sample size distribution is illustrated in Table 1.

Table 1: Sample size distribution

Population	Village	Sample Size
Water users	Mbuganyekundu	40
	Jobaj	40
	Dumbechand	40
Key informants	Village water users' committee members	6
	Dream Village WASH project staffs	4
Total		130

3.4.3 Sampling procedure

The study applied both non-probability and probability sampling procedures. These procedures are described clearly in the following sub-headings:

3.4.3.1 Non-probability sampling procedure

In non-probability sampling procedure, specifically purposive sampling technique was employed to obtain three villages (Mbuganyekundu, Jobaj and Dumbechand) to include

in the study; it was also applied to get key informants who were the village water users' committee and Dream Village project staffs. The same procedure was also applied to get water users for the study, for example, the head of households was purposively selected to participate in the study, when he/she was not present during data collection another member of the household who had the ability of providing households' information was purposively selected to replace the head of the household.

In getting villages to include in the study the only criterion considered was based on all three villages in which the project of village WASH was implemented. In obtaining the key informants, the research went directly to the villages leaders and project managers, when he did not found them he was supposed to visit again for the next time until he found them available. The head of households were also selected purposively based on their positions in the households. The main reason of applying the non-probability sampling in this study was to obtain the only three villages in which the village WASH project was implemented. Another reason was to obtain detailed information from the key informants who had chances to participate directly in this study.

3.4.3.2 Probability sampling

The probability sampling procedure was used to select the households to include in study. When the researcher was provided with the list of all households in the village, a simple random sampling technique was applied to obtain the households which were to be included in the sample size. In addition, in this simple random sampling a lottery method was employed, when a researcher was provided with the list of all households from the village offices, the households were arranged alphabetically and numbered accordingly. The second step was to write numbers listed in the sampling frame on small piece of papers and placing them in a jar. The third step was to mix all papers well and taking out

one piece of paper from a jar. The process was repeated until the required number of households was reached in each village. After selecting the households to visit, a researcher used a guide person who was familiar with the concerned village to show the position where each household was found. The probability sampling technique particularly the simple random sampling with rotary method was applied for the main reason of avoiding biasness in selecting houses to include in the ward.

3.5 Unit of Analysis

The unit of analysis for this study was households of water users in the three villages.

3.6 Data Collection

3.6.1 Primary data collection

Primary data were collected by using questionnaire survey, key informant interviews and Focus Group Discussion (FGD).

3.6.1.1 Questionnaire

The questionnaires consisted both closed-ended and open-ended questions for gathering quantitative and qualitative information required for the study. Open-ended questions allowed freedom of expression because the respondents were using their own words, while closed-ended questions limited respondents to specific answers in order to obtain information on the magnitude of the issues under study in quantitative manner. In this research, 120 questionnaires were administered to water users in three villages Mbuganyekundu, Jobaj, and Dumbechand.

Questionnaires are one of the most popular and important instruments of collecting data through utilization of questions that focus on the issue being researched. Prior to administering the questionnaires, Researcher provided detailed information about the

research. In the explanation, researcher emphasized the purpose of this study, its significance, and the manner in which it would benefit them and others. Researcher also emphasized the issue of confidentiality, freedom of answering only questions they felt comfortable to answer, and their right to withdraw from the study at any time without facing any consequences.

3.6.1.2 Focus group discussions

Focus Group Discussion involved water users, village water users' committee members, and Dream Village project staff. The group discussion included 6 to 8 participants together in a single session of approximately an hour to generate ideas on access to water services. Additionally, simple random sampling was considered in the selection of the 6-8 heads of households to include in FGDs. In each group discussion, heads of households of 18 years old and above was included, moreover the groups organization involved both sex in equal proportion.

The method was helpful as the study respondents were able to share their feelings and opinions about the study topic. It was also used to obtain in depth understanding of attitudes, impressions, and insights (qualitative data) about the study topic of from the group. Checklists were the guidelines in conducting discussion.

3.6.1.3 Interview

In this study interviews were done by using a well-structured checklist to key informants who were; village water users' committee members and dream village WASH project managers. The single interview was set to take a minimum of 60 minutes and the maximum of 90 minutes. The main reason of using interview as a method for data collection in this study was to obtain the point of view of an individual regarding the situations or experiences on water access before the dream village WASH project and

after the project. The obtained qualitative data could be helpful in analysis as supportive findings to quantitative data.

3.6.2 Secondary data

Secondary data related to the study were collected and reviewed. Secondary data mainly came from the records of the efforts and plans for water activities in the project area and its surroundings. All documents related to the project were reviewed. These included water users' committee reports and National Water Policy particularly of 2002.

3.7 Data Analysis

3.7.1 Quantitative data analysis

Quantitative data collected through questionnaires, were sorted, coded, summarized, and analysed using Statistical Package for Social Science (SPSS) version 21. Furthermore, descriptive statistics such as frequency and percentages were used to determine, describe, and present the findings including the socio-economic characteristics of respondents.

Additionally, inferential analysis was used to test the three predicted hypotheses:

- *H1: The water access to community has been improved after the intervention of dream village WASH project compared to the situation before.*
- *H2: The community involvement in water project increases access to water users.*
- *H3: The opinion of water users on dream village WASH project affects water access to community in the study area.*

Regression model specifically multiple linear regression was used to test the relationship between three predictors of water access in the three hypotheses. These predictors were: the intervention of dream village WASH project; community involvement in water project and opinion of water users on dream village WASH project.

As it is stipulated by Yin (2003), multiple linear regression analysis is a method designed to measure linear relationship between dependent and two or more (multiple) independent variables or predictors.

According to Cramer and Howitt (2006), the predictor could be qualitative or quantitative. The authors further argue that if the predictors are qualitative, they have to be transformed into dichotomous variables known as dummy variables. Usually during this process, the dummy variables are made on less than the number of categories making qualitative variable. Therefore, in this study all qualitative data in nature were transformed to dummy variable for inferential analysis as described in the following formula;

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_nX_n$$

Whereas:

Y = Dependent variable (Access to water services) i.e. (0 = if not accessing,

1 = if accessing)

X_s = Independent variables

a = Y intercept, where the regression line crosses the Y axis

b₁ = the partial slope for X₁ on Y

X₁ = intervention of dream village WASH project (0 = before intervention,

1 = after intervention)

X₂ = Community involvement (0 = improve access, 1 = not improve access)

X₃ = Opinion of water users on dream village WASH project (0 = positive influence, 1 = negative influence)

3.7.2 Qualitative data analysis

As it was described previously, this study also collected qualitative data through interviews, open-ended questions, and documentary review. All three objectives included data of this nature. Therefore, the analysis of qualitative data was treated differently from quantitative data; qualitative data were analyzed through content analysis. In this analysis, collected data were coded and the categories of codes were created. Thereafter, different themes from the coded categories were developed and used to create quotes that were useful in generating the contents.

3.8 Ethical Considerations

The study adhered to the ethical principle, whereby a researcher was granted a research permit by the Vice Chancellor of the Sokoine University of Agriculture that introduced the researcher to the World Vision Tanzania and Karatu District Council. In addition, from there, there was given an introductory letter for the three villages in Baray Ward. The researcher assured the respondents that any information they would provide would be confidential and that the respondents were free not to answer any question that they did not feel/want to respond. Additionally, the study involved only participants who signed a consent form to indicate their willingness to participate in the study. Participants were free to withdraw from the study at any time. Data collected were kept confidential and to be used for the purpose of this study alone.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the analysis of the study as set out in methods. Additionally, the findings are based on the assessment of the household access to water service in Karatu District. It is important to note that, data were gathered from questionnaire, in-depth interview checklist, focus group discussions, and documentary review as instruments designed in line with the objectives of the study. Therefore, the first part provides detailed information about socio-demographic characteristics of participants. The second part provides the findings about the household level of access to water services before and after dream village WASH project; the third part provides the analysis of the findings based to community involvement in dream village WASH project. The last part describes the findings based to household water users' perceptions on dream village WASH project in the study area.

4.2 Socio-Demographic Characteristics of Participants

The study begun by general analysis on socio-demographic characteristics data obtained from all participants who were involved in this study to provide information. It is also important to keep in mind that this part includes all participants that is, water users, members of water user committee, and dream village WASH project managers. It is also important to note that a study was able to reach all the targeted participants. The findings are illustrated in Table 2.

Table 2: Socio-Demographic Characteristics of Respondents

Characteristics	Category	Frequency (N=130)	Percentages (%)
Age distribution	18-30 years	30	23.1
	31-43 years	26	20.0
	44-56 years	51	39.2
	Above 56 years	23	17.7
Sex distribution	Male	76	58.5
	Female	54	41.5
Education level distribution	Informal	31	23.8
	Primary	76	58.5
	Secondary	21	16.2
	Higher education	2	1.5
Marital status distribution	Married	85	65.4
	Single	12	9.2
	Widowed	18	13.8
	Divorced	15	11.6
Occupational status distribution		73	56.2
	Self-employed		
	Employed	40	30.8
	Unemployed	17	13.0

4.2.1 Age of respondents

Age is an important variable and is a primary basis of socio-demographic classification in vital statistics, censuses, and survey; advanced age indicates level of maturity of individuals, in that sense age becomes more important variable to examine (Mbwilo, 2008). Therefore, age of the individuals is one of the measures employed in this study for understanding socio-demographic characteristics of participants. Accordingly, the data provided in Table 2 indicate that 39% of the participants were in the age which range from 44-56 years, 23.1% were in the age range from 18-30 years, 20% were in the range of 31-43 years, and 17.7% were e above 56 years. The findings imply that all the respondents who were included in this study were mature enough to provide valid information about the topic. However (39.2%) were in age the range of 44-56 years as

compared to other categories. This could be because, most of the people prefer to establish their own households and act as the household heads when they reached that level of maturity.

4.2.2 Sex of the respondents

Sex the respondents was also among the socio-demographic characteristics investigated in this study. This variable was considered very important in social institutions in Tanzania hence it is variably affected by social and economic phenomenon. Data in Table 2 indicate that 58.5percent of respondents were males and the remaining 41.5percent were females. Therefore, the findings imply that, the study included both sex at almost equal proportion. The number of males was higher compared to that of females. This is attributed to the nature of Tanzanian tradition whereby most of the households are headed by males.

4.2.3 Educational level of the respondents

Educational level of the Respondents in this study was also considered as an important variable that could be applied to determine households' access to water services. The findings in Table 2 show that, 58.5 percent of respondents had primary level of education, 23.8 percent had not gone to formal schools, 16.2 percent had secondary education, and 1.5 percent had higher education. The findings imply that more than three quarters (76.2%) of the respondents who participated in this study had gone to formal education, hence they knew how to read and write, and their knowledge and attitudes in responding to questions were updated. Therefore, the researcher was assured with the validity of the collected data. However, few respondents had not attained any formal education, but due to self-administered system of questionnaires, all the respondents were helped to understand questions effectively for clear responses.

4.2.4 Marital status of the respondents

The perceptions and attitudes of the person can differ by the marital status of the person because marriage might make one responsible and matured enough in understanding and giving responses to the questions asked (Kasogela, 2016). Therefore, the variable marital status was considered in this study. The findings in Table 2 show that 65.4 percent of the respondents were married, 13.8 percent were widow, 11.6 percent were divorced and 9.2 percent were single. These findings indicate that most of the household heads who participated in the study were responsible in their households of at least more than two persons. Therefore, it was their responsibility to ensure that enough water was available for household needs; and this means that they were able to provide valid information about water accessibility in their households.

4.2.5 Occupational status of the respondents

An individual's occupation has a bearing on his/her personality and so is the way of looking at the problem confronting him/her (Mbwilo, 2008). The quality of life might also be determined by an individual's occupation and the income he/she derives from it (Mbwilo, 2008). In other words, the person's response to a problem is determined by the type of occupation he/she is engaged in and hence the variable occupation was considered in this study. The findings in Table 2 indicate that 56.2 percent of the respondents were self-employed in different economic activities (agriculture and business), 30.8 percent were formally employed in either public or private sectors, and 13 percent were unemployed; this means they had no any economic activities for earning money.

4.3 Level of Access to Water Services before and after Dream Village WASH Project

The main aim of the first objective was to assess the situation of household access to water service before and after the dream village WASH project, here the researcher

wanted to understand if the project had been helpful for the households to minimize the burden of water accessibility within the project area. Therefore, to attain this objective the collected data were based on sources of water, time spent for fetching water, and distance from households to water point. The respondents were needed to state about each theme by identifying the real situation before and after the dream village WASH project. The findings are illustrated and discussed in the following sub-sections:

4.3.1 Sources of water

The findings in Figure 3 illustrate that, before the implementation of the dream village WASH project 50 percent of the respondents used surface water as a source of water for household needs, 46.2 percent used unprotected shallow wells, and only very few (3.8%) respondents used tap water. Furthermore, the study was also able to get information concerning sources of water after the implementation of the dream village WASH project, the finding show that 83.1 percent claimed to use tap water as a source of water for the household uses, 10.1 percent reported to use unprotected shallows, and 6.8 percent claimed to use surface water.

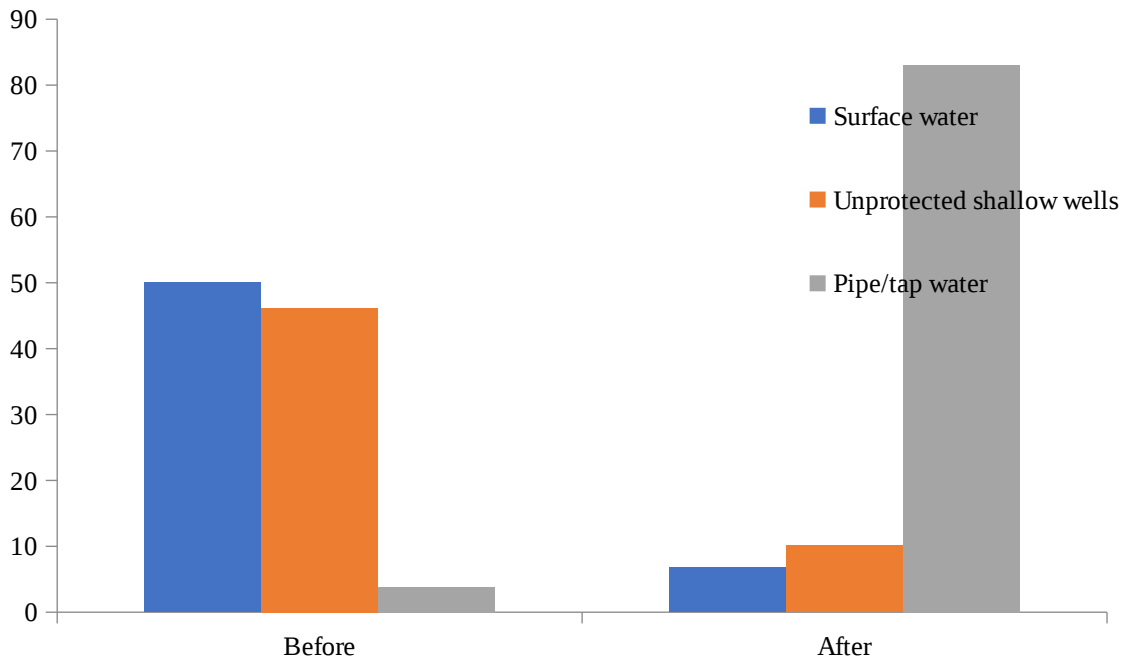


Figure 3: Source of Water (n=120)

In the interview session with key informants, the researcher was able to understand that before the project, people used to fetch water in sources of water, which were not safe for their health, but after the project implementation, they get clean and safe water through installed sources such as taps.

As during the interview session, the key informants from the category of village water users committee pointed out:

“We are now happy, you know, before this project we used to fetch water from different sources such as rivers, dams, streams and pond, but today we get it through taps. We can say that this project helps us to escape from diseases”.
(Mbuganyekundu village).

These findings imply that the dream village WASH project leads to the increase of the number of people who use safe and clean water sources, as it has been indicated that households which used tap water before the project had increased from 3.8 to 83.1percent after the project. These findings are in line with the Mellor (2009) observation that, intervention based on water source of enabling households' members to fetch water easily may influence good hygiene and sanitation as well as households' members' good health.

4.3.2 Time Spent to Fetch

The findings in Table 3 indicate that before the dream village WASH project, 74.2 percent of the respondents were using more than one hour (≥ 61 minutes) to fetch water from water sources to the household. About 13.3 percent were using 46-60 minutes, 6.7 percent were using 31-45 minutes, 4.2 percent using 16-30 minutes, and only 1.6 percent of the respondents were using less than or equal to 15 minutes (≤ 15 minutes). After the implementation of dream village WASH project the findings show that 56.7 percent of the respondents' used less than or equal to 15 minutes (≤ 15 minutes) to fetch water from taps or drop points. About 37.5 percent used 16-30 minutes, and 5.8 percent used 31-45 minutes. No respondents used more than 45 minutes to fetch water. During the interview with key informants, the researcher was able to understand that people from households used one to five hours to find water for domestic uses.

Table 3: Time Spent to Fetch Water (in minutes) n=120

Time	Before		After	
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
≤ 15 Minutes	2	1.6	68	56.7
16-30 Minutes	5	4.2	45	37.5
31-45 Minutes	8	6.7	7	4.2
46-60 Minutes	16	13.3	0	0.0
≥ 61 Minutes	89	74.2	0	0.0

Total	120	100.0	120	100.0
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The key informants during the interview session had this to say,

“Before the project, people used to wake up very early in the morning and start to find water for households’ needs; sometimes they used even five hours to get it” (Dumbechand).

The findings imply that the establishment of dream village WASH project has succeeded to reduce distance of fetching water from households to water points. As it can be seen, before the project only 5.8 percent of the households that participated in this study were able to access water services within 30 minutes, but after the project the statistics show that the number increased to 94.2 percent who were able to access water within 30 minutes time.

4.3.3 Distance from household to water points

The findings in Table 4 indicate that before the implementation of dream village WASH project 45.8 percent of the respondents used to walk for more than 1000 metres (more than 1 kilometre) in search for water for households needs, 41.7 percent used to walk for from 701-1000 metres, and 12.5 percent used to walk from 401-700 metres. However, the situation seem to have improved after the project implementation as 58.3percent of the respondents accessed water at the range of 101-400 metres (within 400 metres), 29.2 percent accessed water services within 100 metres, whereby only 12.5 percent of the respondents accessed water services at 401 to 700 metres. No respondents walked for more than 1 kilometre for water services.

Table 4: Distance from household to water point (n=120)

Distance (in metres)	Before		After	
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
within 100	0	0.0	35	29.2
101-400	0	0.0	70	58.3
401-700	15	12.5	15	12.5
701-1000	50	41.7	0	0.0
> 1000	55	45.8	0	0.0
Total	120	100.0	120	100.0

The interview session with key informants revealed that before the project most of the water consumers in households had to walk for long distances and sometimes for the whole day during dried season to fetch water. This was claimed to be a challenge because people were not able to balance time for doing other economic activities.

The key informants confirmed,

“Villagers used to walk for a long distance of more than two kilometres to collect water which made them fail to engage in other economic activities as much time was spent fetching for water that is not even safe, students also fail to attend school in time because they help parents to collect water.” (Dumbechand)

These findings imply that the dream village WASH project has resulted to the reduction of distance from households to water sources/water points. Most of the water consumers in the study area are now able to access water within a distance of 400 metres. Therefore, they are now able to save time for doing other economic activities such as agriculture and different businesses. However, the findings support the recommendation of the Nation

Water Policy (NAWAPO, 2002) that the emphases is on the reduction of distance of accessing water from households to water points to be not more than 400 metres, however, the standard level could be not more than 100 metres.

4.4 Community Involvement in Dream Village WASH Project

In the second objective the study assessed community's involvement in water projects particularly in the dream village WASH project in the study area. Therefore, some of the questions asked related to the community's involvement in the decision-making, community contribution, representation, authority and control over the project. In order to get valid data for this objective, a Likert scale with five options (strongly disagree, disagree, neutral, agree, and strongly agree) was used. Detailed information was collected from key informants and the findings are presented in through the following sub-heading:

4.4.1 Decision making

The findings in Figure 4 show that, 46.7 percent of the respondents who participated in this study agreed that they were involved in decision-making concerning the dream village WASH project, 25 percent strongly agreed, 15 percent were neutral, 5 percent disagreed, and 8.3 percent strongly disagreed.

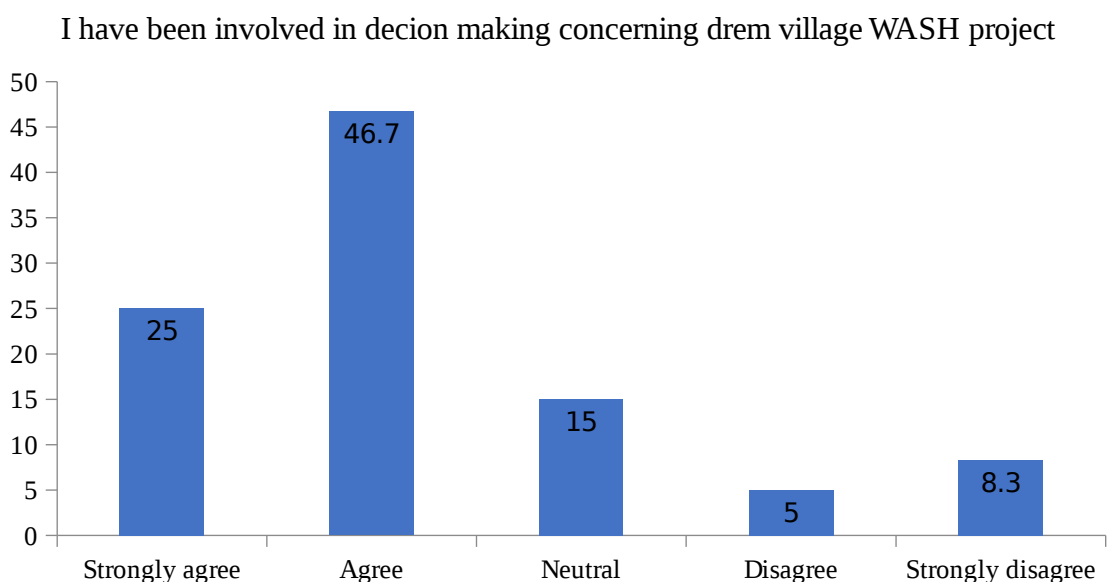


Figure 4: Involvement in decision making (n=120)

The findings from Focus Group Discussion (FGDs) with households water users, village water users' committee members, and dream village WASH project managers, revealed that in each stage of the project household waters users were involved in the decisions about the project through village meetings.

The household water users in FGDs stated,

“We can make an inference that all decisions for this project were done by us, we were participating in the village meetings and pass decisions about all agenda concerning this project, and I can say this is the main reason for successions we have got”. (Jobaj village).

Other participants from the category of water users' committee team had this to say,

“Our main task in this project was to facilitate a coordination between water users and project managers, all things we discussed with the project managers, we used to present them in village meetings then people were needed to decide on what, how and when to do or sometimes to ignore them completely.” (Mbuganyekundu village)

These findings imply that most of the water users were able to participate in the project and make decisions through village meetings. However, some of them were not able to participate because they did not attend village meetings where all decisions about the dream village WASH project were made. The findings are in line with the findings in a study by Thwala's (2010), which indicate that proper understanding of community involvement in the project can be determined by looking at how the beneficiaries were

involved in decision making during designing, implementation, and in making the project sustainable.

4.4.2 Community Contribution

Apart from involvement in decision making, Figure 5 shows that 66.7 percent of the respondents who participated in this study strongly agreed that they were involved in dream village WASH project through financial contribution(water charges per bucket) 10.5 percent agreed, 4.2 percent neither agreed nor disagreed, 6.6 percent disagreed, and 11.7 percent strongly disagreed.

I have been involved in dream village WASH project through financial contribution

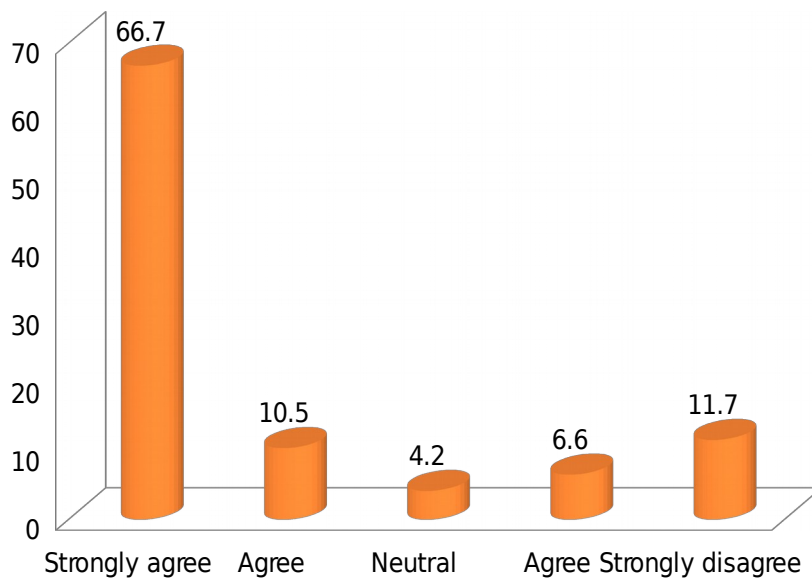


Figure 5: Involvement in financial contribution (n=120)

During FGDs, it was revealed that, household water users in the community were responsible for providing in kind contribution, as the effective means of making the project sustainable all the time.

As the participants of the FGDs stated that:

“This is our own project; therefore we make our contribution in kind through providing safeguarding of water infrastructures, reporting illegal water connections and reporting those who tend to destroy water sources.”(Dumbechand village).

The findings from interview with the dream vision WASH project managers, as key informants revealed that, water users contribute to the user fee services by considering the volume of water (20 litres). This kind of contribution was meant to cover for the operating and maintenance expenses.

The key informants in the interview said,

“We have educated household water users on how to operate water projects communally without depending on the government, therefore they usually contribute to user fee; this is very helpful when they need spares to repair the installed source of water.”(Dumbechand village).

These findings imply that the community is involved in contributing their efforts either in kind or financially to dream village WASH project for the maintenance of the project infrastructures.

4.4.3 Participating through representatives

Different from decision-making and community contribution, Figure 6 indicates that 58.3 percent of the respondents who participated in this study agreed with the statement that they were involved in dream village WASH project through their representative leaders, 16.7 percent strongly agreed, 4.2 percent were neutral, 12.5 percent disagreed, and 8.3 percent strongly disagreed. In the interview with the key informants, it was revealed that community members were involved in dream village WASH project through their

representatives. It was revealed further that, household water users were capable of developing water users' committee team with 10-12 members with gender representatives. This team had the task of representing the whole community in the outside meetings that were done by project managers.

I have been involved in dream village WASH project through representative leaders

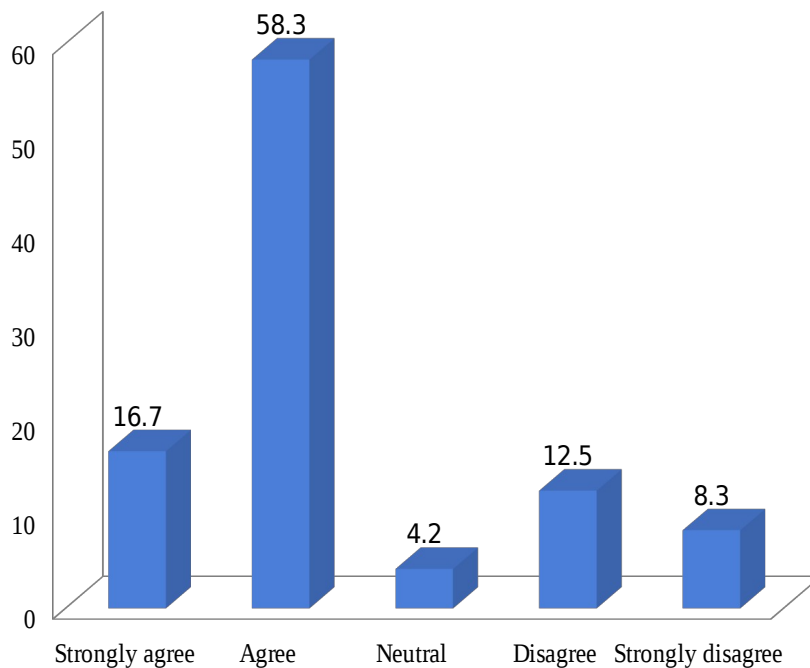


Figure 6: Involvement through representative leaders (n=120)

4.4.4 Control over the project

The findings in Figure 7 illustrate that 54.1 percent of the respondents who participated in the study agreed that they were allowed to control over all issues concerning the dream village WASH project, 16.7 percent strongly agreed, other 16.7 percent were neutral, 8.3 percent disagreed, while 4.2 percent strongly disagreed. In the focus group discussions (FGDs) it was reported that, after the implementation of the project, members were given all the rights over the control of the project themselves. To manage and have control over the project, household water users were educated on technical skills, by producing local technicians who were responsible for minor maintenance of the project. Moreover, they

were given the rights to control and arrange for user fee charges for water service through their water user committee.

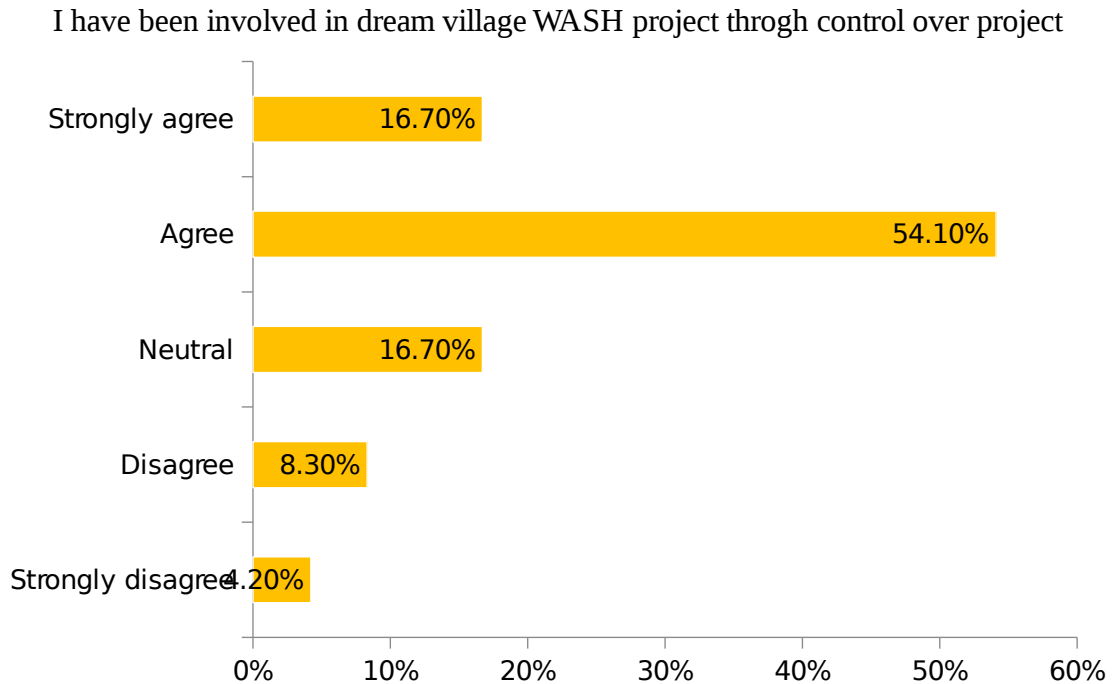


Figure 7: Involvement through control over project (n=120)

The participants in FGDs stated,

“We are given a sense of ownership with this project; therefore all things are controlled and arranged by us. Through our water committee, we are able to arrange for water price and to make control over all project infrastructures; however, sometimes we get advices from project managers and local government authorities.” (Jobaj village).

A key informant participant from the interview had this to say,

“What we believe is that the work of controlling over the project is for the beneficiaries who are the owner of the project, therefore we have provided them with knowledge, skills, and techniques of controlling this project. We as the project managers will remain as advisers where necessary.” (Dumbechand village).

These findings imply that household water users have been given the rights of ownership and control of the project themselves. Moreover, to facilitate controlling, household water users have been imparted with knowledge, skills, and techniques of running and controlling the project sustainably.

4.5 Household Water Users' opinion on Dream Village WASH project

For the third objective, the study wanted to determine the household water users' opinion on dream village WASH project in the study area. As Wright *et al.* (2012) observed, it is important to consider community perception on water projects. To collect valid data about this objective, a Likert scale with five options (strongly disagree, disagree, undecided, agree, and strongly agree) was used. The respondents were required to select one of the options to each of the provided statements. The selected option depends to how the respondent perceived the dream village WASH project. Thereafter, the analysis was done by combining strongly disagrees and disagrees to “disagree,” strongly agree and agree were combined to “agree,” whereby “undecided” was not changed. The findings are illustrated in Table 5 and discussed in the sub-sections below:

Table 5: Household Water Users Opinions (n=120)

Statement	Disagree		Undecided		Agree	
	F	(%)	F	(%)	F	(%)
Reduced risks of diseases	24	20.0	11	9.2	85	70.8
Reduced work load	24	20.0	6	5.0	90	75.0
Increased income generating activities	30	25.0	27	22.5	63	52.5
Increasing child school attendance	12	10.0	24	20.0	84	70.0
Reduced conflict	12	10.0	8	6.3	100	83.7
Reduced risks while searching water	15	12.5	18	15.0	87	72.5

4.5.1 Reduced risks of diseases

The findings in Table 5 indicate that 70.8 percent of the respondents agreed with the perception that dream village WASH project reduced risks of diseases, 20.0 percent disagreed and 9.2 neither agreed nor disagreed. The findings from focus group discussions (FGDs) revealed that before the implementation of dream village WASH project, people from households used to fetch water from unprotected sources such as swamps, rivers, and ponds. Therefore, water from unprotected sources was neither safe also nor clean, this caused diseases such as cholera and diarrhoea.

The findings imply that dream village WASH project has benefited household water users hence, they now get safe and clean water as the results they can protect themselves from water borne diseases. the findings are in line with the findings in a study by WHO (2014) which revealed that, although drinking water coverage has increased worldwide, access to reliable water is still a challenge to most of people in rural areas, poor water quality poses a risk of water borne diseases.

4.5.2 Reduced work load

Table 6 also shows that 75percent of the respondents agreed with the statement that the dream village WASH project reduced workload, 20.0 percent disagreed, and 5.0 percent neither agreed nor disagreed. During the interview with the key informants, it was reported that before the dream village WASH project, the work of fetching water was a burden hence people particularly women would wake up very early in the morning and sometimes walk long distances in search for water carrying buckets as heavy as 20 litres of water.

As one of these key informants stated,

“The project is very helpful, as you see before this project, women were to carry buckets of water for more than 4 kilometres this was a challenge, but now people get water within 100 metres.” (Jobaj village).

The above findings imply that dream village WASH project has reduced workload of carrying buckets full of water for long distances. The findings imply that women are the direct beneficiaries of the dream village WASH project because they are usually responsible for finding water for household needs.

4.5.3 Increasing income generating activities

The findings in Table 6 reveal that 52.5 percent of the respondents who participated in this study agreed with the statement that the dream village WASH project increased income generating activities, 25.0 percent disagreed, while 22.5 percent were undecided.

The findings from focus group discussion (FDGs) reveal that the introduction of dream village WASH project has helped people attend other activities such as agriculture and business, because they get enough time of performing such activities.

As the participants in the FDGs said,

“Currently, we get time to perform other economic activities, this was cumbersome before dream village WASH project, we were using almost the whole day to find for water, but now within ten minutes the task of fetching water is finished”. (Dumbechand village).

Other participant in FGDs had this to say,

“At least now we are able to perform other economic activities, for example, now I get time to grow vegetables which I sell them and increase my household income.” (Dumbechand village)

These findings imply that before the dream village WASH project, people were not producing properly due to lack of time. The task of fetching water was an obstacle for them against attending other economic activities such as livestock keeping, farming, and different businesses. The findings also imply that due to performing of different economic activities as a result of dream village WASH project, people are able to increase household income and improve their living conditions.

4.5.4 Increasing child school attendance

The findings in Table 5 indicate that 70.0 percent of the respondents agreed with the statement that the dream village WASH project had increased child school attendance, 20.0 percent were undecided, and 10.0 percent disagreed. In the interview session with key informants, it was reported that before the project implementation, children used their schooling time to search for water for household needs. Therefore, many children were not able to attend to school daily, but after the implementation of the project, they could quickly access water and prepare themselves to go to school in time.

4.5.5 Reduced conflicts

The findings in Table 5 also indicate that of the respondents agreed with the statement that the dream village WASH project had reduced conflicts, 10.0 percent disagreed, and 6.3 percent were Undecided.

Findings from key informants confirmed that before the project, people used to struggle to access water for domestic uses, while livestock keepers were also struggling to get water for their animals. Although there were two groups (household water users and livestock keepers) of people who struggle for access to water services, all were depending on the same sources of water that were rivers and ponds. Therefore, because they were depending on the same sources, they were likely to get into water conflict.

This implies that, the dream village WASH project helped in solving conflict over water resources; hence, water for household domestic uses is now accessed through taps while swamps and rivers could be used for domestic animals.

4.5.6 Reduced risks while searching water

Different from the above findings, 72.5 percent of the respondents agreed that the dream village WASH project had reduced risks during searching for water, 15 percent were undecided, and 12.5 percent disagreed. Through interviews it was reported that before the project, people particularly women who used to search for water for domestic purposes faced some kind of risks along the way to water sources.

As one of the key informants said,

“Our mothers and children were at high risks when they were walking for water services, sometimes they met with wild animals and other dangerous things.”
(Mbuganyekundu village)

Another participant in FGDs commented,

“Our children were in danger of being raped when they walked long distances to the water sources, as you know they passed through bushes with no one in sight, of course it was risky.” (Dumbechand village)

The findings imply that, due to long distances people walked for water services, they were at risk of being raped or attacked by wild animals. Nevertheless, the dream village WASH project has been helpful, hence people are now not working for long distances, they access water at point close to their households, and hence the risks of being attacked or raped have been reduced.

4.6 Regression Analysis on Independent Variables (Intervention of Dream Village Wash Project, Community Involvement in water Project and Opinion of Water Users on Dream Village Wash Project) Against Dependent Variable (Access to Water Services)

A multiple linear regression model was developed whereby three predictors were involved, the intervention of dream village WASH project, community involvement in water project, and opinion of water users on dream village WASH project, against one dependent variable, that is access to water services, as illustrated in Table 6. The main reason of conducting this kind of test was to establish the influence of the three mentioned predictors on access to water services.

The results in Table 6 indicate that all three predictors; the intervention of dream village WASH project, community involvement in water project, and water users' opinion on dream village WASH project were found to be statistically significant at level ($P \leq 0.05$) in accessing water services. The findings also illustrate that all the three predictors have a positive influence on the dependent variable (access to water services). This means that, the increase or change in one unit of these three predictors could increase or change positively the level of access to water services in one unit.

Table 6: Results of Regression Analysis on Dependent and Independent Variables

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
(Constant)	0.162	0.377		0.430	0.000
Intervention dream village WASH project	0.033	0.302	0.014	0.110	0.000
Community involvement in water project	0.033	0.302	0.037	0.110	0.012
Opinion of water users on dream village WASH project	0.605	0.384	0.645	1.574	0.000
R ² = 99.1%					
Adjusted R ² = 99%					

Dependent Variable: Access to water services

These findings also imply that, because the dream villages WASH project has put more efforts on the three predictors by putting intervention of the dream village WASH project, involving community in project, and using water users' opinions to address the problem of water, there must be access of water-to-water users in the household level in the study area. In addition, opinions of water users on water services encourage them to participate effectively in water project. For example when community perceive that water is to be valid as a community, this perception will force the community to pay for water then that money could be used to install other water points or to repair for the destroyed water points.

In addition, the results in Table 6 indicates that R²=99.1 percent, implying that 99.1 percent of the used variance was explained by all independent variables, while the remaining 0.9 percent was explained by other factors unknown to the researcher.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

The conclusion was made based on the assessed household access to water services in Karatu District in Arusha region. Specific objectives were to establish the level of access to water services before and after the dream village WASH project, to assess community involvement in dream village WASH project, and to determine household water users' perceptions on dream village WASH project.

Based on the findings found in the first objective, this study concludes that the level of access to water services in the study area was very low before the implementation of dream village WASH project. Household water users' in the study area were used unprotected sources of water; they walked long distances for searching for water, and paid high prices per bucket of water. However, after the project, the level of access to water services by household water users improved, hence, they are able to use taps, the distance from households to water points has been reduced, and they access water services at affordable prices.

Based on the findings obtained in the first objective, this study also concludes that community members were involved in the dream village WASH project from the initial to the final stage. The findings show that household water users within the community were involved in the project. This was especially through decision-making, and making in kind and financial contribution, and in having control over the project., the water users'

committee team was used to represent the community in each meeting with the project managers to ensure that the community involvement was done at each stage of the project implementation.

Moreover, this study also concludes that household water users have positive perceptions towards the dream village WASH project. They believe that the project is very helpful to them, it has minimised the burdens of accessing water services. The water project has reduced the risk of contracting waterborne diseases, workload, and conflict over water, and security risks especially while searching for water. The project has also improved school attendance among school going children. Finally, the study concludes that, improved level of access to water services, community involvement in water service project and household water users' perceptions in water services may influence accessibility of water services among the households. Through inferential analysis three predictors were found to be statistically significant ($p \leq 0.05$) regarding households access to water services.

5.2 Recommendations

Based on the findings and conclusions of the study, to enhance access to water services by households, the following recommendations are made:

Since the dream village WASH project has managed to improve the level of access to water services among household water users in the study area, other Non-Government Organisations (NGOs) should design and implement water services projects in other villages of Tanzania to facilitate rural water accessibility.

Because community involvement in dream village WASH project has proven to result to positive impacts on access to water services among household water users in the study

area, other NGOs and stakeholders that implement community development projects should adopt this approach for good results.

Since the community has to assume ownership of the dream village WASH project in the study area, the government through its water committee team and other stakeholders should provide training on project management skills to the committee teams of water users in the study area and other areas, which have similar projects. Trainings could be provided through seminars and workshops.

Perceived accessibility of water services by household water users has been proven as a determinant of access to water services in the study area, other NGOs should first assess the perception of the beneficiaries towards water services before implementing any water project; this could be helpful in assessing whether the project would be beneficial to the target people.

REFERENCES

- Al'Afghani, M. M., Kohlitz, J. and Willetts, J. (2019). Not built to last: improving legal and institutional arrangements for community-based water and sanitation service delivery in Indonesia. *Water Alternative* 12: 285 – 303.
- Ananda, J. (2013). Collaborative approaches to water management and planning; an institutional perspective. *Journal of Ecological Economics*, 86: 97 – 106.
- Bailey, D. K. and Mouton, J. (1998). *Methods of Social Sciences Research*. The Free Press Collier Macmillan Publisher, London. 43pp.
- Blessing, T., Costa, H. and Magi, S. (2016). Community participation in NGO" development project in Zimbabwe: Myth or Reality. *Journal of Human Ecology* 55(3): 237 – 248.
- Boudet, H. S., Jayasundera, D. C. and Davis, J. (2011). Drivers of conflict in developing country infrastructure projects: experience from the water and pipeline sectors. *Journal of Construction Engineering and Management* 137(7): 498 – 511.
- Chatterley, C., Linden, K. G. and Javernick-Will, A. (2013). Identifying pathways to continued maintenance of school sanitation in Belize. *Journal of Water, Sanitation and Hygiene for Development* 3(3): 411 – 422.
- Cobbinah, P. B., Black, R. and Thwarts, R. (2011). Reflections on the six decades of the concept of development: Evaluation and Future Research. *Journal of Sustainable Development in Africa* 13(7): 134 – 140.
- Cornwall, A. (2008). Unpacking 'participation': Models, meanings and practices. *Community Development Journal* 43(3): 269 – 283.
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. (4th Ed.), Sage Publications Ltd., London. 295pp.

- Cumming, O. and Curtis, V. (2018). Implications of wash Benefits trials for water and sanitation. *The Lancet Global Health* 6(6): 613 – 614.
- Daud, M. K., Nafees, M., Ali, S., Rizwan, M., Bajwa, R. A., Shakoor, M. B. and Malook, I. (2017). Drinking water quality status and contamination in Pakistan. *Biomed Research*
- Dietrich, P., Eskerod, P., Dalcher, D. and Sand hawalia, B. (2010). The dynamics of collaboration in multi-partner projects. *Project Management Journal* 41(4): 59 – 78.
- Dill, B. (2009). The paradoxes of community-based participation in Dar es Salaam. *Development and Change*, 40(4): 717 – 743.
- Dill, B. (2010). Public partnerships in urban water provision: The case of Dar es Salaam. *Journal of International Development* 22(5): 611 – 624.
- Esin, J. O. and Ebong, M. S. (2016). Community participation and the sustainability of rural water delivery services in a Nigerian Coastal Settlement of Oron, Akwa Ibom State, Nigeria. *International Journal of Social Sciences* 10(4): 45 – 87.
- Esther, W., Dungumaroa, E. W. and Madulub, N. F (2003). Public participation in integrated water resources management: The case of Tanzania. *Elsevier* 28(27): 1009 – 1014.
- Finney, J. W. and Moos, R. H. (1992). Four types of theory that can guide treatment evaluations. In: *Using Theory to Improve Program and Policy Evaluations*. (Edited by Chen, H. and Rossi, P. H.), Greenwood Press, New York. pp. 49 – 69.
- Francesco, M., Gimelli, B., Rogers, C and Joannette, J. B. (2018). The quest for water, rights and freedoms: Informal urban settlements in India. *International Journal of Urban and Regional Research* 42(6): 1080 – 1095.

- Francis, M., Nagarajan, G., Sarkar, R., Mohan, V., Kang, G. and Balraj, V. (2015). Perception of drinking water safety and factors influencing acceptance and sustainability of a water quality intervention in rural southern India. *BioMed Central Public Health* 15(1): 1 – 9.
- Fry, L. M., Cowden, J. R., Watkins Jr, D. W., Clasen, T. and Mihelcic, J. R. (2010). Quantifying health improvements from water quantity enhancement: An engineering perspective applied to rainwater harvesting in West Africa. *Environmental Science and Technology* 44(24): 9535 – 9541.
- Garrick, D. E., Hall, J. W., Dobson, A., Damania, R., Grafton, R. Q., Hope, R. and O'donnell, E. (2017). Valuing water for sustainable development. *Science* 358(6366): 1003 – 1005.
- Geere, J. A. L., Hunter, P. R. and Jagals, P. (2010). Domestic water carrying and its implications for health: a review and mixed methods pilot study in Limpopo Province, South Africa. *Environmental Health* 9(1): 1 – 52.
- Graham, J. P., Hirai, M. and Kim, S. S. (2016). An analysis of water collection labor among women and children in 24 sub-Saharan African countries. *PloS One* 11(6): e0155981.
- Guerra-López, I. and Hicks, K. (2015). The participatory design of a performance oriented monitoring and evaluation system in an international development environment. *Evaluation and Program Planning* 48(3): 21 – 30.
- Hailu, D., Rendtorff-Smith, S. and Tsukada, R. (2011). *Small-scale Water Providers in Kenya: Pioneers or Predators*. United Nations Development Programme, New York. 125pp.
- Herbst, S., Benedikter, S. and Koester, U. (2009). Perceptions of water, sanitation and health: A case study from the Mekong Delta, Vietnam. *Water Science and Technology* 60(3): 699 – 707.

- Hope, R. (2015). Is community water management the community's choice? Implications for water and development policy in Africa. *Water Policy* 17(4): 664 – 667.
- Hope, R., Foster, T., Krolikowski, A. and Cohen, I. (2011). *Mobile Water Payment Innovations in Urban Africa*. Centre for Social Entrepreneurship at Saïd Business School, UK. 19pp.
- Hove, M. and Tirimboi, A. (2011). Assessment of Harare water service delivery. *Journal of Sustainable Development in Africa* 13(4): 61 – 84.
- Hunter, P. R., MacDonald, A. M. and Carter RC (2010) Water supply and health. *PLoS Med* 7(11): e1000361.
- Hutton G. (2012). Global costs and benefits of reaching universal coverage sanitation and drinking-water supply. *Journal of Water and Health* 11(1): 1 – 12.
- Imoro, B. and Fielmua, N. (2011). Community ownership and management of water and sanitation facilities: Issues and projects in the Nadowli District of the Upper West Region of Ghana. *Journal of Sustainable Development in Africa* 13(2): 74 – 87.
- Irianti, S., Prasetyoputra, P., Sasimartoyo, T. and Lee, A. (2016). Determinants of household drinking-water source in Indonesia: An analysis of the 2007 Indonesian family life survey. *Cogent Medicine* 3: 1 – 13.
- Janna., E. C., Rebecca. A., Witinok-Huber, B. L. and Bruyere, W. D. N. (2018). Giving women a voice on decision-making about water: barriers and opportunities in Laikipia, Kenya. *Gender, Place and Culture* 3: 1 – 21.
- Jiménez, A and Pérez-Foguet, A (2011). The relationship between technology and functionality of rural water points: evidence from Tanzania. *Water Science and Technology* 63(5): 948 – 955.

- Jiménez, A. and Pérez-Foguet, A. (2010). Challenges for water governance in rural water supply: Lessons learned from Tanzania. *International Journal of Water Resources Development* 26(2): 235 – 248.
- Jiménez, A. and Pérez-Foguet, A. 2011. Water point mapping for the analysis of rural water supply plans: Case study from Tanzania. *Journal of Water Resources Planning and Management* 137(5): 439 – 447.
- Juran, L. and MacDonald, M. C. (2014). An assessment of boiling as a method of household water treatment in South India. *Journal of Water and Health* 12(4): 791 – 802.
- Jutta, L., Paul, A., Bain, L. D. and Kubzansky, C. S. (2010). Well-being measurement and the WHO health policy Health 2010: systematic review of measurement scales. *European Journal of Public Health* 25(4): 731–740.
- Kasogela. O. (2016). Community owned water supply organizations and accessibility of safe and clean water: A Case of Mvomero District. Dissertation for Award of MSc Degree at University of Agriculture, Morogoro, Tanzania,
- Katz, T. (2017). Making Rural Water Supply Sustainable: Report on the Impact of Project Rules. [www.wsp.org/sites/wsp/files/publications/global_ruralreport.pdf] site visited on 8/5/2020.
- Kayser, G. L., Moriarty, P., Fonseca, C. and Bartram, J. (2013). Domestic water service delivery indicators and frameworks for monitoring, evaluation, policy and planning: A review. *International Journal of Environmental Research and Public Health* 10(10): 4812 – 4835.
- Kimambo, Z., Mhamba, R., Sokile, C. S. and Tukai, R. (2003). Private water public grime: domestic water supply and poverty alleviation in Tanzania. *4thWater Net/Warfsa Symposium: Water, Science, Technology and Policy Convergence and Action by All*, Dar es Salaam, Tanzania. pp. 15 – 17.

- Kondracki, N. L. and Wellman, N. S. (2002). Content Analysis: Review of methods and their applications in nutritional education. *Journal of Nutrition Education and Behaviour* 34: 224 – 230.
- Kvarnström, E., McConville, J. and Bracken, P. (2011). The sanitation ladder – a need for a revamp? *Journal of Water Sanitation and Hygiene for Development* 1(1): 3 – 12.
- Kyamani, W. A. (2013). Determinants of rural water project sustainability: A case of Rufiji district, Pwani region, Tanzania. Dissertation for Award of MSc Degree at Sokoine University of Agriculture, Morogoro, Tanzania, 94pp.
- Liu, L., Johnson, H. L., Cousens, S., Perin, J., Scott, S., Lawn, J. E. and Mathers, C. (2012). Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. *The Lancet* 379(9832): 2151 – 2161.
- Mandara, C. G., Butijn, C. and Niehof, A. 2013. Community management and sustainability of rural water facilities in Tanzania. *Water Policy* 15(2): 79 – 100.
- Mason, N., Doczi, J. and Cummings, C. (2016). Innovating for pro-poor services: why politics matter. [<https://www.odi.org/sites/odi.org.uk/files/resource-documents/10349.pdf>] site visited on 7/5/2020.
- Mellor, E. J. (2009). Water and sanitation accessibility and the health of rural Ugandans. Dissertation for Award of MSc Degree at Michigan Technological University, USA,
- Montgomery, M. A., Bartram, J. and Elimelech, M. (2009). Increasing functional sustainability of water and sanitation supplies in rural sub-Saharan Africa. *Environmental Engineering Science* 26(5): 1017 – 1023.
- Mukumbang, F. C., Van Belle, S., Marchal, B. and vanWyk, B. (2016). Towards developing an initial Programme theory: Programme designers and managers

- assumptions on the antiretroviral treatment adherence Club Programme in primary health care facilities in the metropolitan area of Western Cape Province, South Africa. *PloS One* 11(8): 34 – 55.
- Mwendi, D. R. (2013). The Contribution of World Vision on Poverty Alleviation through Agricultural Interventions in Tanzania: A Case of Kinampanda Area Development Programme-Iramba, Singida. Dissertation for Award of MSc Degree at Mzumbe University, Morogoro, Tanzania,
- MWR (2012). *Water is Defined as a Natural Resource, Fundamental to Life*. Ministry of Water Resources, Dar es Salaam. 2pp.
- National Bureau of Statistics (2012). *Tanzania Population and Housing Census*. National Bureau of Statistics. Dares Salaam, Tanzania. 264pp.
- Osei, L., Amoyaw, J., Boateng, G. O., Boamah, S. and Luginaah, I. (2015). The paradox of water accessibility: understanding the temporal and spatial dimensions of access to improved water sources in Rwanda. *Journal of Water, Sanitation and Hygiene for Development* 5(4): 553 – 564.
- Peletz, R., Cock-Esteb, A., Ysenburg, D., Haji, S., Khush, R., and Dupas, P. (2017). Supply and demand for improved sanitation: Results from randomized pricing experiments in rural Tanzania. *Environmental Science and Technology* 51(12): 7138 – 7147.
- Petersen-Perlman, J. D., Veilleux, J. C. and Wolf, A. T. (2017). International water conflict and cooperation: challenges and opportunities, *Water International* 42(2): 105 – 120.
- Pretty, J. N. (1995). Participatory learning for sustainable agriculture. *World Development* 23(8): 1247 – 1263.
- Prüss, A. and Havelaar, A. (2001). The global burden of disease study and applications in water, sanitation and hygiene. In: *Water Quality: Guidelines, Standards and*

Health. Risk Assessment and Management for Water-Related Infectious Disease. (Edited by Fewtrell, L. and Bartram, J.), IWA Publishing, London. 59pp.

- Ramos da Silva, S., Heller, L., de Campos Valadares, J. and Cairncross, S. (2010). Relationship (or its lack) between population and a water and sanitation service: a study of users' perception in Vitoria (ES) Brazil. *Journal Water Health* 8(4): 764 – 778.
- Rosenqvist, T., Mitchell, C. and Willetts, J. (2016). A short history of how we think and talk about sanitation services and why it matters. *Journal of Water, Sanitation and Hygiene for Development* 6(2): 298 – 312.
- Sandra, R. (2016). Improving the management of water multifunctional through stakeholders involvements in decision making processes, Spain: *Journal of Utilities Policy* 30: 1 – 11.
- Sara, J. (2005). *Rural Water Supply and Sanitation in Bolivia: From Pilot Project to National Program.* World Bank, Washington DC.
- Sharpe, G. (2011). A review of program theory and theory-based evaluations. *American International Journal of Contemporary Research* 1(3): 72 – 75.
- Shepherd, D. P. (2011). *The Promotion of Mental Health and Emotional Wellbeing of Children through Participatory Partnership Work with School Communities in One Local Authority.* University of Birmingham, USA. 13pp.
- Smiley, S. L. (2013). Complexities of water access in Dar es Salaam, Tanzania. *Applied Geography* 41: 132 – 138.
- Sorenson, S. B., Morssink, C., and Campos, P. A. (2011). Safe access to safe water in low income countries: Water fetching in current times. *Social Science and Medicine* 72(9): 1522 – 1526.

- Spencer, J. H. (2008). Household strategies for securing clean water: the demand for piped water in vietnam's peri-urban settlements. *Journal of Planning Education and Research* 28(2): 213 – 224.
- Steptoe, A., Deaton, A. and Stone, A. A. (2015). Subjective wellbeing, health, and ageing. *The Lancet* 385(9968): 640 – 648.
- Tantoh, H. B. (2016). Community-based water resource management in North-west Cameroon: the role of potable water supply in community development. *South African Geographical Journal* 99: 1 – 2.
- Tariq, M., Khan, S., Ali L., Khattak, S., Latif, K., Hussain, R. and Yousaf, S. (2015). Assessment of drinking water quality in Narangi and surrounding areas of district Swabi, Pakistan. *Journal of Himalayan Earth Sciences* 48(1): 1 – 69.
- Thoradeniya, B. (2015). Community perceptions on drinking and domestic water: A pilot study. Institute of Technology, University of Moratuwa, Sri Lanka
- UNDP (2016). Human development. [<http://hdr.undp.org/en/reports/global/hdr2016>] site visited on 26/3/2018.
- United Nations (2015). Sustainable development goals. [[http://www.un.org/sustainable – development –goals/](http://www.un.org/sustainable-development-goals/)] site visited on 26/03/2018.
- URT (2012). *Artesian Well Drilled at Kahe Village, Moshi Rural*. Ministry of Water, Dar es Salaam, Tanzania. 119pp.
- URT (2012). *The National Water Policy*. Ministry of Water and Livestock, Dar es Salaam, Tanzania. 20pp.
- Van Dijk, M. P. (2008). Role of small-scale independent providers in water and sanitation. *International Journal of Water* 4(3/4): 275 – 289.
- Van Rooij, J.W. (2011). The future of Water Sanitation and Hygiene Innovation, Adaptation and Engagement in a changing World: Creating accountability lines

for sustainable rural water services in Tanzania. SNV, Mwanza, Tanzania. 122pp.

- Wang, X. and Hunter, P. R. (2010). A systematic review and meta-analysis of the association between self-reported diarrheal disease and distance from home to water source. *The American Journal of Tropical Medicine and Hygiene* 83(3): 582 – 584.
- Welle, K., Williams, J., Pearce, J. and Befani, B. (2015). Testing the Waters: A qualitative comparative analysis of the factors affecting success in rendering water services sustainable based on ICT Reporting. Water AID, Uganda. [[http://opendocs .ids.ac.uk/opendocs/handle/123456789/7099](http://opendocs.ids.ac.uk/opendocs/handle/123456789/7099)] site visited on 20/3/2019.
- Wesselink, A., Hoppe, R. and Lemmens, R. (2015). Not just a tool. Taking context into account in the development of a mobile app for rural water supply in Tanzania. *Water Alternatives* 8(2): 57 – 76.
- Whittington, D., Hanemann, W. M., Sadoff, C. and Jeuland, M. (2009). The challenge of improving water and sanitation services in less developed countries. *Foundations and Trends in Microeconomics* 4(7): 469 – 609.
- WHO (2003). The right to water. Geneva. [http://www.who.int/water_sanitation_health/enrighttowater.pdf] site visited on 26/03/2018.
- WHO (2014). UN-water global analysis and assessment of sanitation and drinking- water. [http://www.who.int/water_sanitation_health/glaas] site visited on 26/03/2018.
- WHO (2017b). *Progress on Drinking Water, Sanitation*. World Health Organization, Geneva, Switzerland. 110pp.

- WHO and UNICEF (2010). Joint monitoring programme for water supply and sanitation. [http://whqlibdoc.who.int/publications/2010/9789241563956_eng_full_text.pdf] site visited on 13/4/2018.
- WHO U (2014) *Progress on Drinking Water and Sanitation: 2014 Update*. World Health Organization, Geneva.
- WHO/UNICEF (2014). Progress on sanitation and drinking-water. Joint monitoring programme for water supply and sanitation. [www.un water.org/.../wgounicef] site visited on 21/4/2018.
- Willekens, F. (2016). Family and household. [<https://www.researchgate.net/publication/254813722>] site visited on 7/5/2020.
- Wolf, J., Prüss-Ustün, A., Cumming, O., Bartram, J., Bonjour, S., Cairncross, S. and Fewtrell, L. (2014). Systematic review: Assessing the impact of drinking water and sanitation on diarrhoeal disease in low-and middle-income settings: systematic review and meta-regression. *Tropical Medicine and International Health* 19(8): 928 – 942.
- World Bank (2017). *World Development Indicators*. World Bank, Washington DC. 31pp.
- World Bank. (2018). *Reaching for the SDGs: The Untapped Potential of Tanzania's Water Supply, Sanitation, and Hygiene Sector*. World Bank, Washington DC. 49pp.
- World Health Organization (2012). *Progress on Drinking Water and Sanitation*. WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, New York. 11pp.
- World health Organization (2013). *Progress on Drinking Water and Sanitation*. World Health Organization, Geneva, Switzerland. 22pp.
- World Health Organization. (2009). *Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks*. World Health Organization, Geneva. 9pp.

- World Vision Tanzania (2016). *Dream Village Assessment Report*. World Vision International, Arusha. 9pp.
- Wright, J. A., Yang, H., Rivett, U. and Gundry, S. W. (2012). Public perception of drinking water safety in South Africa 2002–2009: A repeated cross-sectional study. *BioMed Central Public Health* 12(1): 556 – 563.
- Yamane, T. (1967). *Statistics: An Introductory Analysis*. (2ndEd.), Harper and Row, New York. 886pp.
- Yates, T., Lantagne, D., Mintz, E. and Quick, R. (2015). The impact of water, sanitation, and hygiene interventions on the health and well-being of people living with HIV: A systematic review. *Journal of Acquired Immune Deficiency Syndromes* 68: 318 – 330.
- Yosef, J. (2009). Building a conceptual framework: philosophy, definitions, and procedure. *International Journal of Qualitative Methods* 8(4): 49 – 62.
- URT (2005). National Water Sector Development Strategy 2006-2015 Final Draft.

APPENDICES

Appendix 1: Questionnaire for a household survey

My Name is DOREEN MOWO, pursuing MA Project Management and Evaluation at Sokoine University of Agriculture. I am working on a research project titled, Access to water services in Karatu district. Please allow me to ask you a number of questions concerning the topic mentioned above and the information you provide will be confidential, I am kindly requesting for your cooperation.

A) Geographical Location

Ward

Village

Date

Questionnaire number

B) Social Demographic Characteristics of the Respondent

Questions	Response
1. Age of respondent (Years)	
2. Sex of respondent. i = Male ii = Female	
3. Years of formal education	
4. Level of education. i = No formal education, ii = Primary education, iii= Secondary education, iv = higher education level	
5. Marital status. i = Married , ii = Single, iii = Widowed, 4 = Divorced	
6. Main respondent occupation. i = Agricultural activities ii = Business, ii = employed, iv = A combination	

7. What is the size of your household?

i. Males

ii. Females

C) Level of access to water services before and after the water project intervention

Questions	Before	After
8. What are the major sources of water for your household?	1.Piped (tap) water, 2.surface water (rivers, lakes, dam, stream and pond) 3.Unprotected shallow wells 4.protected shallow wells Others specify.....	
9. Are those water sources available for the whole year?	1. Yes 2. No	
10. Where do you collect water during dry season?	1.Piped (tap) water, 2.surface water (rivers, lakes, dam, stream and pond) 3.Unprotected shallow wells 4.protected shallow wells Any other	
11. Who is responsible to collect water between the household members?	1) Man 2) Woman 3) Children 4) Both members of the household	
12. How much time do you spent on collecting water per day(distance) 13.		
14. What is the Quantity (litres per day) do your household use 15.		
16. What means of water transportation are used?	1) On head 2) By bicycle 3) Wheelbarrow 4) Animal Others (Specify)	
17. What is/was the price of 20 litres of water?
18. What is the actual distance in meters were/are you using to access water for household uses?(meters) (meters)

19. What are the common diseases affecting your household

- i. Diarrheal diseases
- ii. Skin disease
- iii. Malaria
- iv. Others.....

20. What do you think are the causes of diarrheal?

.....

For the past six months did any member of your household suffer from diarrheal diseases?

- i. Yes
- ii. No

Explain.....

21. What were the problems/challenges faced by your household due to poor access of water?

.....

D). Household Participation on Water Project

22. Do you know any water project?

- i. Yes
- ii. No

If yes, which are they.....

23. Did you participate in any of the water project?

- i. Yes
- ii. No

24. How do you think about community involvement in the dream village WASH project? *(Please tick in the box that is relevant to the statements)*

	STATEMENTS	Strong Disagree	disagree	Undecided	Agree	Strong Agree
22a	We are involved in decision-making					
22b	We have been involved in the project through in kind and financial contributions.					
22c	We have been represented with our leaders in each stage of the project.					
22d	We get a chance to participate in the project by controlling over all issues concerning the project.					

E) Household perception on water project services

25. Household opinion on the water project services.(Please put a tick were appropriate)

S/ N	Statements	Strong disagree	disagree	Undecided	Agree	Strongly agree
23a	The project is helpful hence it has reduced risk of diseases					
23b	Due to the dream village WASH project work load has been reduced.					
23c	Through the project agricultural activities have been improved in our area.					
23d	Now we able to increase our household income due to different economic activities we do as a result of the project.					
23e	Our children are now able to attend to school daily as it was dot done before this project.					
23f	Conflicts over water resources have been reduced as the benefit we get through the project					
23g	The project has reduced risks while searching water for household needs.					

26. What is your opinion/recommendation on the water project established within your _____ area?

.....

THANK YOU FOR YOUR COOPERATION

Appendix 2: Checklist for dream village Project staff

1. When did the project start?
2. What was the reason for establishing this project in the area?
3. What approaches were used to implement the dream village project?
5. Do you work in partnership with any other NGO's?
6. What are the activities performed within the dream village project?
7. How many technical staffs are employed in the project?
8. What are the community attitudes on the implementation of dream village project?
9. Did the community members participate in the early stages of the project? How?
10. What are the challenges faced during the implementation of the dream village project?
11. What measures are taken to address these challenges?
12. What benefit does your organization get from this project?
13. How do you ensure the sustainability of water projects?

THANKYOU

Appendix 3: Checklist for a Focus Group Discussion

1. What do you know about the water project in your area?
2. Where you involved in the planning process of the project?
3. What challenges did you face before the implementation of the project?
4. How did you participate in managing the project?
5. What are the changes brought by the intervention of dream village project?
6. How do you manage water sources to ensure its sustainability?
7. What are the benefits accrued by the villagers from having this project?
8. What is your opinion/recommendation on the Dream Village Project?