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DETERMINANTS OF WATER BORNE DISEASES AMONG COMMUNITIES OF ZIMBABWE: A CASE STUDY OF CHIREDZI DISTRICT, MASVINGO PROVINCE, 2021

BY

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Abstract

The study was prompted by the reoccurrence of water borne diseases. For almost every year, the district experience a cholera outbreak. Chiredzi District is one of Zimbabwe's most vulnerable districts to cyclones, droughts, water and sanitation related diseases outbreaks. Several interventions including public health promotion have been implemented in the District however; the vulnerability tag seems stuck on the district. Water and sanitation accessibility is a worrying global problem that disrupts progress in the fight against diarrheal diseases. The roles of women and girls ,youth and people living with disability in decision making and the extent of their involvement in to Water, Sanitation and Hygiene (WASH) governance issues. In an attempt to answer the research questions, analytic cross-sectional research design was used employing both qualitative and quantitative methods. The total number of participants was 183 from five wards that were under study in Chiredzi District .The participants were 131 (66.12%) females whist 62(33.88%) were males. Gender was not statistically associated with contacting water borne diseases the p value =0.023. Educational level being attained was associated with reduced contact of water borne diseases [COR: 0.26(95%CI: 0.19-0.37) $p<0.001$. On safe practises 168(92.31%) of respondents indicated that they wash hands at critical times only .Only 2(1.10 %) of respondents do not constantly wash their hands with soap and water. However, 12 (6.29%) indicated that they wash hands before and after eating food. The role of water collection proved to be a burden for women and girls at home. The adoption of safe practices like drawing water from safe sources, practicing household water treatment, and construction and safe use of sanitation facilities play critical role in reduction of water borne diseases. The study proved statistically the association of safe water source ($p=0.003$) and hand washing ($p= 0.008$) to reduction of waterborne diseases. Although the respondents are aware of the relationship between drinking poor quality water and diseases, they seem not to link the quality of water and the risk of water borne diseases, while more than half of the respondents believe that water quality can be improved, a very small proportion of households are taking measures to improve water quality. Despite the fact that women and girls are the major water users, they are poorly represented in positions of decision making in water governance .Women representation is at 20% (34) in chairing of water point committees. However, a few women are occupying key positions that enable them to take key decisions.

Key words access; community; equity; gender mainstreaming; improved sanitation

Declaration

I, Phillina Sakhille Mukaro, student number 180046 do hereby declare that this dissertation is my original work except where sources have been cited and acknowledged. The work has never been submitted, nor will it ever be submitted to another university for the award of a degree.

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Acronyms

BVIP	Blair Ventilated Improved Pit
CHC	Community Health Club
DEHO	District Environmental Health Officer
DWSSC	District Water and Sanitation Sub-Committee
EHT	Environmental Health Technician.
HPO	Health Promotion Officer
ODF	Open Defaecation Free
PHHE	Participatory Health and Hygiene Education
PWSSC	Provincial Water Supply and Sanitation Sub-Committee
RDC	Rural District Council
UNICEF	United Nations Children's Emergency Fund
VHW	Village Health Worker
VPM	Village Pump Mechanic
WASH	Water Sanitation and Hygiene
WHO	World Health Organisation
WPC	Water Point Committee
WWSSC	Ward Water Supply and Sanitation Sub-Committee
ZINWA	Zimbabwe National Water Authority

Definition of terms

Access ability to use sanitation infrastructure and services considering the type of sanitation service available, the design of the program and the environmental conditions.

Community A group of people sharing the same geographical area, often using the same common property, identifying with each other and seeking to work together.

Equity means fairness and impartiality to all concerned.in the context of sanitation and hygiene it recognizes that there should be no policy, legal technological barriers that exclude access to entitlements.

Gender mainstreaming is an approach in which equal participation between men and women is practiced in core decision making and at a scale.

Improved sanitation means safe disposal of human excreta and waste to prevent human contact with excreta

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CHAPTER 1 INTRODUCTION

1.1 Introduction

Water borne can be transmitted from one person to another. These conditions result in consumption of contaminated water (World Health Organisation, 2020). The most common diseases are cholera, dysentery, typhoid, viral hepatitis. Being the largest killers, they cause an estimated 35 million deaths each year, which is approximately 68% of all global deaths (WHO, 2020). Unfortunately, the majority of deaths, which amounts to 75% occur in low and middle economy countries (Centre for Disease Control (CDC), 2012) .They, may be transmitted through unwashed food and hands. Most of these diseases are caused by poor sanitation, due to unmanaged faecal materials contaminating unprotected water bodies. Water borne diseases are also water washed diseases because they prevails where there is inadequate hygiene practices. These diseases are important because they are responsible for the largest burden of global mortality and they can be prevent by ensuring provision of safe water and ensuring proper management of sanitation. (UNICEF, 2019). The challenges in access to clean water is a pre-condition for good health, thereby contributing to the reduction of mortality and morbidity as a result of WASH-related diseases, reduction in the burden of water collection for women and girls. Failure to provision of safe drinking water and provision of better sanitation facilities may result in reoccurrences of cholera, diarrhea and other water related diseases (UNICEF, 2019). The global morbidity and mortality rates can be reduced by about 9.1% and 6.3%, respectively if rapid success is attained in facilitating access to water,

sanitation and hygiene facilities (UNICEF, 2019). Access to safe adequate water for both domestic and livelihood activities is a major challenge in communities and often results in households resorting to using unsafe water sources exposing them to WASH related diseases. Water security and governance issues have also seen communities failing to access water sources due to competition for the scarce resources. This can result in conflicts within and between communities and water governance structures and users.

1.2 Background to the study

Diarrhoea, typhoid and cholera are a major public health concern globally. Morbidity and mortality are high among the children under five years. (CDC, 2019).It is estimated that 446 000 children under the age of 5 years die from diarrhoea. In the world, 11 million cases of typhoid were recorded and 129 00 deaths.in 2019 (WHO, 2020).Diarrheal diseases causes severity in HIV patients and the vulnerable groups which include the elderly, women and children under the age of five.

Typhoid and cholera are a major public health concern. African countries alone accounts for 70% of water borne diseases (WHO, 2020).In 2018, Zimbabwe had an incidence of 19 per 1000 population. Zimbabwe experienced a world record breaking cholera outbreak that affected 55 out of 62 districts resulting in 98,592 cholera cases and 4,288 cholera deaths by July 2009 with a crude fatality rate of 4.43% according to the Government of Zimbabwe 2009.

World Health Organization (WHO) has a target of reducing water related cases by 90% by 2030 (WHO,2015) .About 44 % of the rural populace do

not have access to a toilet facility creating a favourable environment for water borne diseases 24 % of the rural household have no access to safe drinking water(UNICEF,2018). The Constitution of Zimbabwe section regards water supply and sanitation to be the basic human rights. Goal 6 of the sustainable development goals requires governments to ensure availability and sustainable management of water and sanitation for all (UN, 2015).

Zimbabwe was once a model in the region before she has faced a downturn in its economy. This has resulted in the collapse of the Water, Sanitation and Hygiene (WASH) sector fuelled by the ageing infrastructure and poor functionality of water point. This has made the coverage levels, service quality, access and reliability of WASH services to drop. (Dhoba, Nyawasha & Nyamuranga, 2017). Globally, water security is under severe pressure because of a complex interplay of factors that include hydrological conditions, rapid population growth, rural-urban migration, increased per capita water use, pollution of water resources, and over-abstraction of groundwater and climate change. (WHO, 2015).

According to (Sphere,2011) the water, sanitation and hygiene programmes reduce the transmission of water related diseases and their exposure through the promotion of good hygiene practices, provision of safe drinking water and provision of safe sanitation. A safe, reliable, affordable, and easily accessible water supply is essential for good health. Yet, for several decades, about a billion people in developing countries have not had a safe and sustainable water supply (UNICEF, 2018).

Inconsistent safe water supply is a serious threat to life as it causes a lot of health problems and in most cases leading to outbreaks of diarrheal diseases such as cholera, typhoid and dysentery. Sanitation measures that include the safe disposal of excreta, safe disposal of solid waste and control of insects and rodents Hygiene promotion involves the use of water, sanitation and hygiene facilities provided to ensure the combating of the faecal oral diseases.

The peoples existing knowledge, practices and attitude towards interventions has a high impact in reduction of diarrheal diseases. Women and girls are frequently responsible for WASH at household level therefore an understanding of gender dynamics and traditional roles is necessary for successful programs in a community.

More than 785 million people do not have access to at least basic water services and more than 884 million people do not have safe water to drink. More than 2 billion people worldwide do not have access to basic sanitation. The poor access to water supply is a prevalent issue over 850 million people worldwide have limited access to sanitation facilities (UNICEF, 2019). Lack of sanitation facilities for girls reaching puberty makes them more likely to miss school than boy's .Women and girls are more likely to be responsible for collecting water for their families (UNICEF, 2019)

The serious effects of unimproved water supply and sanitation on health and human dignity are reasons why one of the UN Millennium Development Goals was to halve "*the proportion of the population without sustainable access to safe drinking water and basic sanitation*". One key facet of the

Millennium Development Goal was limiting the number of people who openly defecate which UNICEF estimates was at 40% of Zimbabweans in rural areas (United Nations (UN),2014). According to UNICEF (2014), open defecation can be an infringement on human dignity that lowers human capabilities and a risk to clean sanitation and health.

Worldwide, parasitic worms found in contaminated soils infect people and causes conditions such as Guinea worm disease, Buruli ulcer, trachoma and schistosomiasis. These are diseases mostly found in places with unsafe drinking water, poor sanitation and insufficient hygiene practices.

1.3 Statement of the Problem

Chiredzi had 1555 cases and three deaths and one confirmed cholera case for 2022 according to week 7 surveillance report for 2022.Diarrheal cases are high among the under-five. For almost every year, there will be a cholera outbreak in the district beside public health interventions that are ongoing in the district. For the year 2021, 20 300 cases were reported and 228 deaths .118 deaths were for the under 5years.(Government of Zimbabwe Health Report ,2021)

About 500 households, on average, use a single water point as primary source in rural wards of Chiredzi District. This includes river abstraction points that are also shared with their livestock. This has serious implications on the security of some of these water sources, especially for deep and shallow wells, where possibilities of contamination could be very high. The percentage of households with any type of latrine (17.7%), type of latrine in use (8.8%) and with hand-washing facilities (5.4%) are all very low

compared to respective national percentages of 37.4% of households with any type of latrine, 18.2% of households with safe type of latrine in use, and 6.9% of households with hand-washing facilities.

Besides the increase of water access to safe water through drilling of boreholes, communities who resides along rivers still fetch unsafe drinking water from rivers and engage into fishing and washing activities in the water bodies.

Chiredzi District was one of the most affected district. Public health promotion interventions by government and development partners that include water safety promotion, improved household and community sanitation and hygiene behaviour change deployed to mitigate the water borne diseases in the community. Large investments were channelled towards support of safe water in the form of borehole drilling, water point protection, rehabilitation and repair of boreholes by Local Authorities but still these diseases are still a challenge in the district.

There has been several water, sanitation and hygiene promotion projects in Chiredzi District and invariably the water and sanitation vulnerability and disease outbreaks and high prevalence of 10% per 1000 according to Cholera report (2019). The district has water from open surfaces or wells that are not protected and is usually contaminated. Access to safe water and sanitation are a basic human right and without safe water, the promotion of good health and hygiene is compromised.

1.4 Broad Objective

To determine the prevention and control practices associated with water borne diseases in Chiredzi District Masvingo Province, 2021.

1.4.1 Specific Objective

The specific objectives of this study are to:

i. To determine the socio-demographic characteristics associated with water borne diseases amongst the general populace in Chiredzi District, Zimbabwe 2021
ii. Identify knowledge level of the community on prevention and control of water borne diseases in Chiredzi District.
iii. Identify community perceptions and attitudes towards prevention and control of water borne diseases in Chiredzi District.
iv. To identify the prevention and control measures of water borne diseases in Chiredzi district.

1.5 Research questions

The following are the research questions the research sought to answer:

i. What are the demographic factors for water borne diseases in the community of Chiredzi?
ii. What are the community perceptions and attitude towards water, sanitation and hygiene in reduction water related diseases?
iii. What are the most prevalent practices that promote water related diseases in Chiredzi district?

1.6 Justifications

The study seeks to investigate the knowledge and perceptions towards Water, sanitation and hygiene among communities in Chiredzi District, Zimbabwe. The knowledge of villages and perceptions will be used to inform public health interventions planned for the area. Knowledge gaps from this study will also be addressed .The study will act as a guide to inform public health policy at national level for sustainability of the interventions. This study will help in understanding community attitudes and perceptions towards water safety, sanitation and hygiene .The study will help in planning appropriate health and hygiene promotion programs in Chiredzi District and other places where the same can be applied in the counties or other nations were applicable.

It will also help in gaining local support for programs, as communities will be cooperating the strategies and ideas will assist in need identification and budget plans. Continuous deployment of resources year in year out without significant changes is a waste of resources. Information generated can help in mitigating the negative attitudes and perceptions held towards the water, sanitation and hygiene programs and sustainability of the programs in order to reduce the morbidity and mortality rate of the water borne diseases.

1.7 Inclusion and Exclusion criteria of the study

1.7.1 Inclusion criteria

i. Participants from the study area participated in the study.

ii. Only people who gave assent participated in the study

iii. The people living with disability at a household were interviewed

1.7.2 Exclusion criteria

i. Participants outside the study area did not participant in the study.

ii. Participants who did not give assent did not participate in the study**.**

1.8 Delimitation of the study

This study was conducted in Chiredzi District, Masvingo Province in Zimbabwe. The focus was on five rural wards, which served as a representative sample of the 32 wards of the Rural District Council (RDC) Data was collected from 183 participants. The researcher used interview-guided questionnaires for data collection. Due to limited finances and time only residents in rural wards selected for the study. The key respondents were aged between 15years to 65 years. The study was limited to Covid-19 restrictions on management of gathering

CHAPTER 2 REVIEW OF RELATED LITERATURE

2.1 Introduction

The literature that was reviewed in this study was obtained through a search of a number of published articles in journals, newspapers and report. The review of related literature is valuable guide to define the problem recognising its significance ,suggesting promoting data gathering devices, appropriate study design and data sources (Polit & Hungler,2013).The literature is hereby presented starting with the theoretical framework and relevance to the study. The mode of transmission and the risk factors.

2.2 The Theoretical Framework

The Health Belief Model Diagram adapted from Baker, 1977

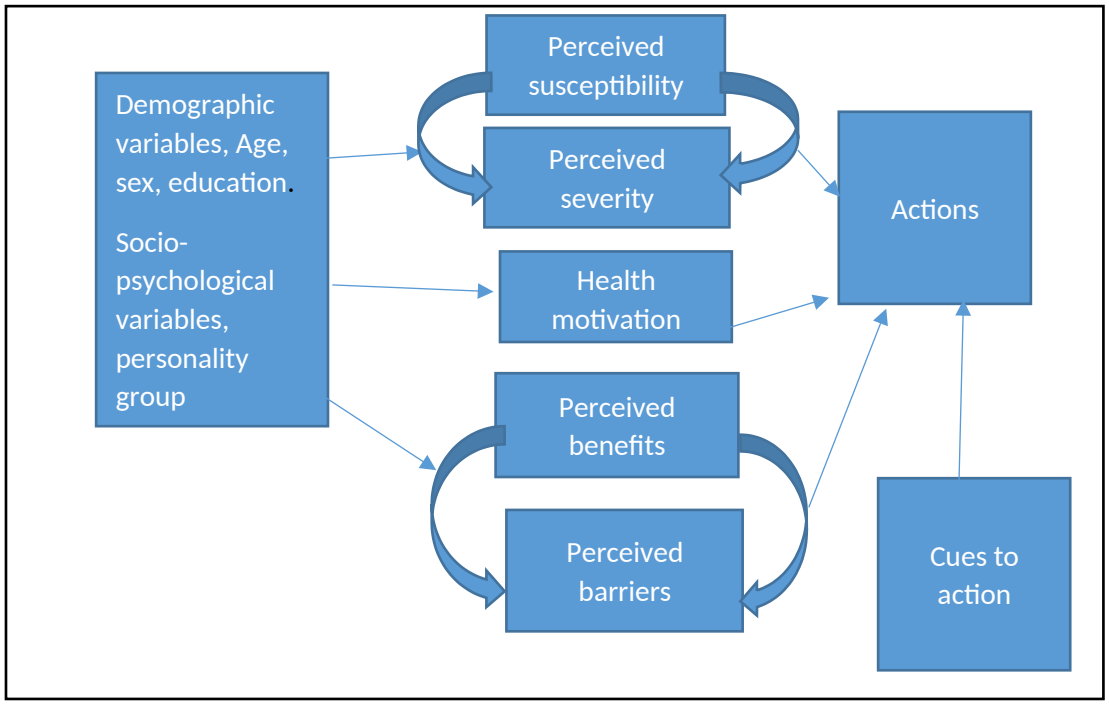

Figure 1Health belief model

2.3 Relevance of the Theoretic Framework

Figure 1 shows the Theoretical framework of the study, which is the Health Belief Model. The theoretical foundation in the Health Belief Model (HBM) integrates people's knowledge, perceptions, attitude and practices to a disease in establishing trends of infection. It argues that people's perceptions influence their health behaviour (Gelaw, 2013). This study targeted communities that had several encounters with public health promotion and have experienced several public health disease outbreaks.

Where communities see the threats in poor sanitation practices, in unsafe water and poor personal hygiene they should be able to change by adopting health-seeking practices. Where they do not change, the reasons could be around their perceptions of risk or the barriers that inhibit the change. In this, study the relationship between the public health promotion that has happened over the years in the target community and the outcomes and impacts on the community.

Personal knowledge and perceptions towards water safety, sanitation and hygiene were assessed basing on the existing or perceived barriers to positive and health seeking behavior change in Chiredzi. The original goal of the Health Belief Model was to focus the effort of researchers aiming to improve public health by understanding why people do not take preventive measures to health promotion (Baker, 1977)

The important aspect is to design a program that encourage people to engage in healthy behaviors. Interventions are designed to prevent health problems encountered in the community. The rationale of the theory is that knowledge

informs practices and repeated practices become habit. Behavior change is influenced by personal beliefs and the four constructs; perceived seriousness of disease, perceived susceptibility, perceived benefits of behavior change and perceived barriers to behavior adoption inform the level of change

Community participation is a strong asset of this health belief model. It has an advantage that asking the questions and participation in the focus group discussion act as a preventive health action cue to action (Jones, Jensen, Scherr, Brown, Christy & Weaveret al. 2015). It serves to remind communities of the good practices that reduce the transmission of water borne diseases. Reverse causation is another weakness of the community where households adopt health-seeking practices due to an illness in the family and not through health promotion and behaviour; change (Mubarak, Wagnner, Asami, Carlson & Boultan 2016).Sometimes the environment may be not conducive to health behaviour adoption like in resource-constrained communities. Reported illnesses will not have anything to do with knowledge, attitudes and perceptions but related to the socio-economic factors like the availability of water treatment technologies and sanitation technologies.

2.4 Water Borne Diseaes

Dysentry, Typhoid and cholera are a major public health concern. African countries alone accounts for 70% of water borne diseases (WHO, 2020).

Cholera is a diarrheal disease caused by bacteria called vibrio cholera. It can cause high morbidity and mortality rate if not controlled as soon as possible.

Population is exposes when living in context with poor water, sanitation and hygiene combined with overcrowded situations. (WHO, 2020)

Typhoid is a faecal oral disease caused by *salmonella enteric* and *serovar typhi*. About 2-5% of the untreated cases may become chronic carriers with or without symptoms. The main route of transmission is through contaminated water and food (WHO, 2020).

Shigellosis/dysentery It is known as bacillary dysentery.it is cause by bacteria called Shigella spp.It mainly affect children under the age of 10.The case fatality rate vary from 10-20%.Most severe outcomes are from children, undernourished people and the elderly(WHO, 2020).

2.4. The Transmission of Water Borne diseases

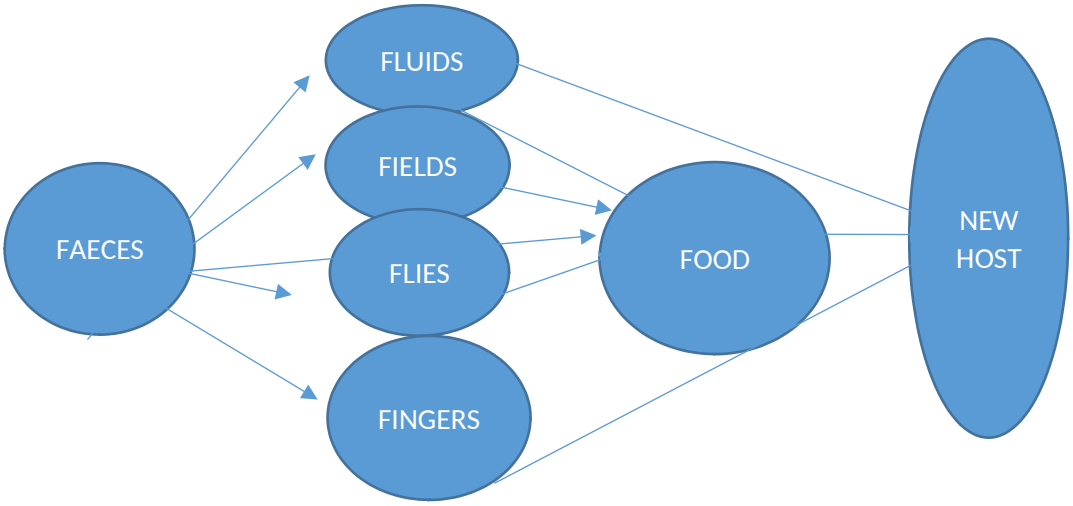

Figure 2 Transmission of water borne diseases adapted from Rural Community Water supply (Richard Carter, 2021).

The above figure shows that disease-causing bacteria, viruses and pathogens, which may be present in human or animal excreta, can enter the moths of children or adults by various routes .Drinking of contaminated water is one of the routes (Cairncross and Valdmanis, 2006).

2.5 Risk factors of water borne diseases

2.5.1 Quality of water

Water quality can be defined as the summary of physical, chemical, biological and aesthetic characteristics of water that impact on its beneficial. (Carter,2021).Secondly, water quality is defined in this study as the physical, chemical and biological characteristics of water in relation to the existence of life and especially human activity(Machiwa,2003)..WHO Guidelines and the national drinking water standards of the majority of the countries, take the

presence of *Escherichia coli* (E. coli) thermos tolerant coliforms as an indication of recent faecal pollution from human or warm-blooded animals (WHO, 2011). Thus, the WHO Guidelines value of zero E. coli or thermos tolerant coliform bacteria in any 100 ml sample of drinking water was established because even low levels of faecal contamination may potentially contain pathogens (WHO, 1993)

The quality of water is a crucial element in both domestic and productive water security. Not only is the availability of the resource necessary, but also an acceptable level of quality that allows its use for different purposes without negatively affecting the health of human beings, animals or the environment should be guaranteed (Machiwa, 2003). In many parts of the world, human health is threatened either from lack of water or from lack of poor water quality. Water supply in rural communities is associated more frequently with waterborne diseases than in both urban and rural areas (WHO, 2009).

2.5.2 Water quantity

The quantity of water available and accessed by a particular household is determined by a number of factors that include distance, time and cost to the consumer, reliability of supply and cost to the service provider consumption (Haward &Bartram,2003)

Low-income families are likely to be at greater risk from poor water supply as they have more limited capacity for storing large volumes of water at home (Zerah, 2000). This can lead to the use of smaller volumes of water for different domestic purposes such as cooking, bathing and general cleaning.

The quantity of water used by households is an important aspect of water security as this determines health and hygiene. The World Health Organisation (WHO) does not have guidelines on the quantity of domestic water that is required to ensure water security by an average household globally or in different continents and to ensure equity of the precious resource. The Water Act of South Africa allocates 25 litres of water free per person per day or 6 kilolitres per household per month (McCafferey &Neville, 2008)

2.5.3 Water availability

Water availability for individuals and households is one of the determinant factors of water.at global level, fresh water accounts for only 2.5% of the earth's water and most of it is frozen in glaciers and ice caps (UNEP, 2010). The remaining unfrozen water is found as ground water with only a fraction present above the ground and in the air. The surface fresh water resources found in rivers, lakes and in the ground are declining due to factors as urbanisation, pollution, demographic changes and socio-economic development. (Middleton, 2013)

2.5.4 Water Access

Access to water resources is very crucial for households if they are to fulfil their daily water needs. Access is defined as the ability to derive benefits from particular resources. In the case of water resources, the physical and technological dimensions determine access, that is, the means used to get water from the source to the place of consumption (Haward &Bartram, 2003) .This includes the infrastructure, technology, technical knowledge and the topography of the area. Access also depends on the governance structures in

place. These include the legal frameworks that define access or authorisation. The organisational component of governance is concerned with policies, laws and institutions that mediate access as well as making decisions on allocation, water distribution, as well as operating and maintenance of water resources (GWP, 2000).

Good governance is closely linked to the role of stakeholders in the management, use and allocation of the resource. Pricing and affordability also determine access to water for household use. Water pricing is seen as an instrument to achieve financial sustainability, as water supply can only be sustainable if the financial costs are recovered from those accessing and using the resource. If the service is provided free, the service provider will not be able to maintain the supply chain and this will eventually lead to the collapse of the system (Savenije& Van der Zaag, 2002). On the other hand, the status of the poor who cannot afford high water prices has to be taken into consideration when considering water as an economic good. The Government of Zimbabwe continued to increase access to water by drilling of boreholes and upgrading to piped water schemes.

2.6 Contributing Factors towards increase of water borne diseases

2.6.1 Knowledge of Water Borne diseases

Knowledge and awareness of these diseases and their risk factors to adoption of preventive measures among populations. Awareness also shapes an individual or community readiness for behaviour change and positive health seeking behaviour. Knowledge gaps can act as barriers to the implementation

of successful community intervention program (Puska, 2002).Knowledge and understanding of risk factors may present a cheaper and

2.6.2 Attitude towards water borne diseases

Attitude is defined as a relatively enduring organisation of beliefs around and object, subject of concept, which predisposes one to respond in some preferential manner (Park, 2011). Attitude has been reports to influence practises shown by Okonta, Ikombele &Ogun Banja (2014) who report a positive Pearson correlation between attitude level and practice level in the study on knowledge, attitude and practises towards water related diseases. Females were reported to be more likely to exhibit positive attitude towards risk factors compared to male counter parts with percentages of 34.2% and 20, 6% respectively.

2.6.3 Practices towards water borne diseases

Practice refers to the practical lifestyle measures that one takes to prevent ill health or promote good health. The practise areas that are risk factors for faecal oral transmitted diseases are drinking unsafe water, practising open defecation and lack of hand washing. Practise is generally correlated with both attitude and knowledge (Okonta et al,2014)

2.7 Summary of Review of Literature

From the literature review presented in this chapter, knowledge and risk factors are high among children under five, there is however need for policy interventions to protect the children under five and community. There is need for promotion of good health and hygiene practices and a comprehensive program to improve sanitation in the community.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the study design and how the study was conducted and data collection tools are explained including the sampling methods used to select the study respondents and sites. The description of how data collection was done and the analysis outline. It indicates the variables of the study, data collection instruments, pretesting instruments, data collection procedure, and ethical considerations.

3.2 The Study design

A descriptive cross sectional study design was used to collect data from the study respondents. A cross sectional study collects information from a number of variables at a particular point in time over a short period of time, cross sectional studies are easy, economical to conduct and are useful for public planning. According to Polit and Hungler (2013), descriptive research provides data for monitoring and evaluating policies and programs. Due to limited time and resources available for the study, a cross sectional study was conducted. Data collection was done using three main instruments; interviewer administered questionnaires, focus group discussion and observations method.

3.3 Population and sampling

3.3.1 Study setting

The study was conducted in hotspots wards that have reported highest incidences of diarrheal disease in the district. The study area comprise of 1 ward which is a farm ward 20,1 communal area ward 7 and 3 resettlement

areas ward 29,30 and ward 32. From the 32 rural wards of the Chiredzi District of Masvingo Province in Zimbabwe, basing on the medical record statistics that were reported for the year 2021.Ward 29 has a peri- urban set up on the eastern side that is the Buffalo ranch and the other side is a resettlement area. The rural health centre that are within the study area include Chilonga Clinic, Tshovani Poly clinic and Chiredzi Hospital. The economy is agro based; it is a home of the two big sugar plantations Hippo valley and Triangle.

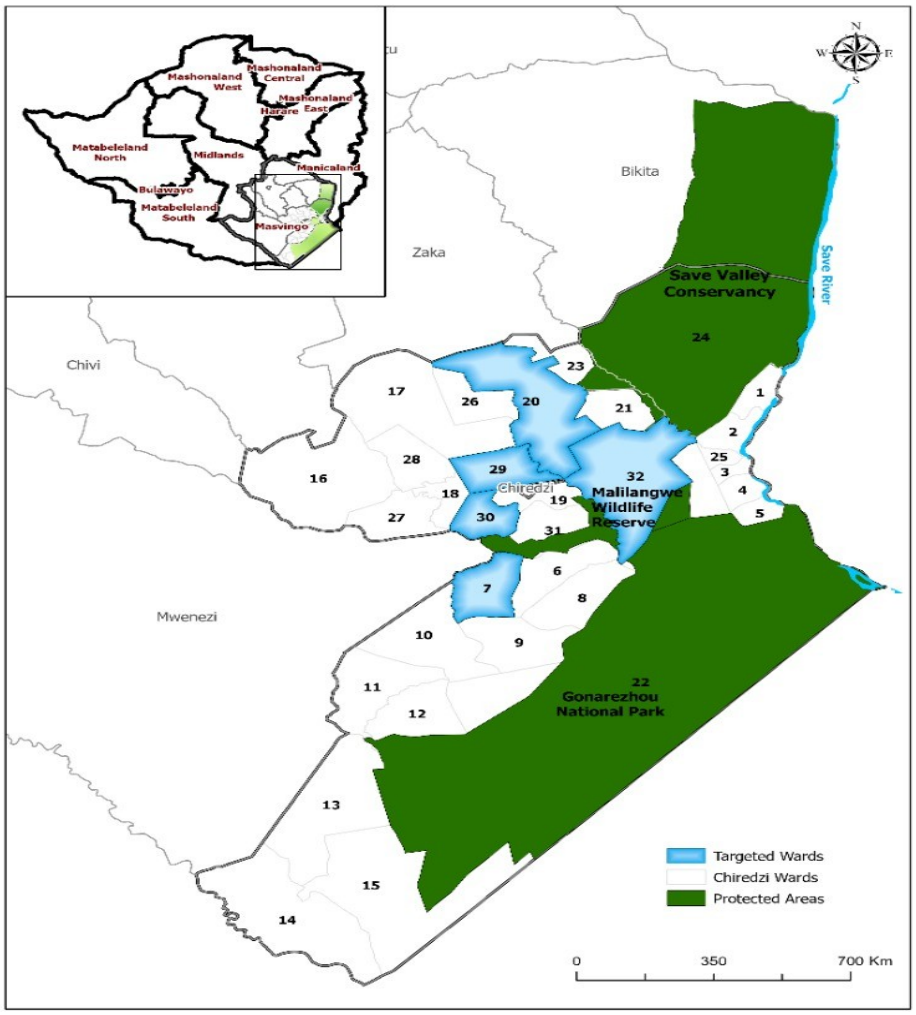

Figure 3: Chiredzi District Map

3.3.2 Study population

The study was carried out in five wards of Chiredzi District. One clinic within the study sample were visited. The Nurses, Environmental Health Technician (E.H.T) and Lab Technician were interviewed. The wards include wards 7, 20, 29, 30 and 32.

3.3.3 Sample size and sampling procedure

Sample size estimation is based on significance level, statistical power and effect size. The level of 0.05 is the accepted significance for social sciences research. This level indicates that 95 times out of 100 of the results will be correct. The sample size calculated was 216 participants. The sampling frame was divided into stratified groups. That is rural, urban, farm and communal areas. The study participants were randomly selected within the ward.

Based on the Dobson's formula for sample size calculation

$$n = \frac{z^2 \times p(1-p)}{d^2}$$

Where n=sample size z^2= 1.96 (Statistic corresponding to 95% level of confidence)

p= 17% (prevalence rate for diarrhoea according to the country profile for environmental burden of diseases)

d^2= 0.05 (margin of error)

$$n = \frac{1.96^2 \times 0.17.(1-0.17)}{0.05^2}$$

n=216

A minimum sample size of 216 will be required for this study.

Maximum sample size will be 216/0. 9= 240 if we anticipated a 10% non-response rate. Therefore, the sample was expected to be between 216 and 240.The key informants were Chilonga Clinic staff.

However, the calculated sample size was not achieved due to limited time for the researcher .The researcher had to do door to door interviews and observations at households. The researcher managed to recruit 183 participants.

3.3.4 Sample per study site

Since the study is focusing on five, wards participants were expected to be as follows

Therefore $\frac{216}{5}$ = 43 and 240/5= 48

From each study site between 43 and 48 participants were expected to be interviewed.

3.3.5 Data Collection Instruments

For data collection, the researcher used three instruments; interviewer administered questionnaires, Focus group discussion and an observation checklist.

A questionnaire is a series of well-formulated written questions, distributed by mail or person to a selected sample. According to Key, (1997) a questionnaire is a means of eliciting the feelings, beliefs, experiences, perceptions or attitudes of some sample individuals. A structured closed and

open-ended questionnaire will be administered to the sample to collect the data regarding the access to safe water.

Focus group discussions

The investigator conducted focus group discussion with ordinary villagers who use the water source from the study area. Four focus group discussions were held for the study with 8-15 people.

Direct observation

Direct observation on different water sources, infrastructure for accessing water, sanitation and hygiene practices were carried out.

3.4 Validity and Reliability

3.4.1 Validity: Polit and Hungler (2013) observed that the triangulation method is one of the best approach of validation of research findings. If one method is weak the other serves to strengthen it and it improves the validity of the instrument. The researcher used both quantitative and qualitative approaches.

3.4.2 Reliability: A pre-test is conducted to examine reliability of the research instruments. The subjects used in the pre-test are not to be used in the actual study. It is expressed as a coefficient: 0.0 not reliable, 1.00 perfect reliability, 0.80 and above acceptable and indicate high reliability, using knowledge from expects (Polit and Hungler, 2013) Reliability testing was done on each instrument following a pretesting of the instrument.

3.5 Pretesting of instruments

A pre-test of instrument was conducted in ward 29 and the participants were not included in the actual study. The questionnaires were administered to caregivers who are not participants of the study in order to ensure that the questions are relevant and clearly articulated. The reasons for the pretesting were to refine the questionnaire, assess the question's validity and reliability of the collected data.

To avoid problems in recording the data. Findings from the Pre-test helped in identifying questions that were showing ambiguity during the pretesting, these were revised, and data was collected.

3.6 Data collection procedure

The investigator interviewed at least 183 participants for 8 days in the first two weeks of April 2022.Participants were randomly selected in a ward. A pretested interviewer administered questionnaire was used to collect data from study participants. The researcher recruited two enumerators to assist in data collection. Interviewers were be trained how to administer the questionnaire in order to reduce errors.

Households were randomly selected in any village of the selected ward. The key respondent was the head of the family present at the time of interview. Privacy was maintained. Upon signing of the consent form, the questionnaire-structured interviews were conducted. Privacy was assured. Each interview lasted for about 15 minutes for each participant. The procedure was repeated until a sample size of 183 was reached. The

observations were done to check for pot racks, cleanliness of containers, hand washing points and general hygiene at the house.

Focus group discussions were done for water point committee, water point users aged 14-70 both males and females A separate discussion was held for women and girls aged 15 to 65.Key Informant interviews were held for the member's staff members for Chilonga clinic staff, the ward councillor, local EHT and village headman.

3.6.1 Study variables

According to Regoniel (2012), variables are those simplified portions of complex phenomena that can one intends to study which change in amount, volume, number, form, type and nature. These variables can be measured through counting or to being subjected to a scale. This breaking down of complex phenomena to small manageable characteristics makes research possible. In the study that seeks to determines and understand the community attitudes and perspectives to safe water, sanitation and general hygiene to prevent reoccurrences of water borne diseases, the variables that were used for the study are as follows and were coded.

3.6.2 Dependent variables

The dependent variable for the study will be

Accessibility level of water, sanitation and hygiene services

The outcome practices, knowledge and attitudes that result from the increased health and hygiene knowledge as evidenced by-

Adoption of safe practices like drawing water from safe sources,

practicing household water treatment,

Safe water drawing methods from container

Safe storage of drinking water

Construction and safe use of sanitation facilities

Improved general hygiene at households

3.6.3 Independent Variables

The independent variables are those that cause a change in the dependent variables. For instance, the independent variable is likely to affect the dependent variable. The independent variable were sex, age, marital status and educational level.

3.7 Data Analysis and Organization of Data

Completed questionnaires were first numbered in chronological order from 1 to 183 and were checked one by one for completeness, errors and inconsistencies. Epi info 7 was used to present descriptive statistics in graphs, charts, frequencies and percentages. The qualitative data was analysed manually for content .Categorical variables were presented as counts and percentages. All hardcopies are kept safely by the investigator .A dataset will be stored on an external drive under lock and key which is kept by the researcher.

3.8 Ethical considerations

The Africa University Department of health sciences gave ethical clearance for the study. Permission was sought from the Chief Executive Officer of Chiredzi Rural District Council (see Appendix 6).The proposal was

submitted for approval by Africa University Research Ethical Committee (AUREC).The researcher proceeded with data collection, analysis and the write up of the dissertation (see Appendix 7).The ethical issues were strictly considered .A consent form was given to each participant. Participants were told the purpose of the study and the benefits of the study .Participation in the study was voluntary and the participants were free to withdraw from the study at any time. Participants were assured anonymity and no coercion was used throughout the study. Confidentiality was assured through use of numbering on the forms.

3.9 Dissemination of findings

The researcher disseminate the information through presentations to District Health Team, Councillors and Provincial Health Task Force. Fliers with relevant information will also be issued to stakeholders involved in WASH services. The findings will be disseminated through reports, seminars, conferences, community awareness programs and publication in peer reviewed journals.

3.10 Summary

This chapter focused on the study design that was used by the researcher, study settings, the study population and sampling procedure. It indicated the variables of the study, data collection instruments, pretesting of instruments, data collection procedure, data analysis and the ethical considerations.

CHAPTER 4 DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the study results of the study and analysis of data obtained from research participants. The researcher also presents findings from interview-administered questionnaires, focus group discussions and observations that the researcher noted during the interviews. Both qualitative and quantitative methods were used for analysis. Frequencies were generated and associations were measured .The researcher used Epi Info version 7 software to do data analysis from participants. Data was presented in form of tables and graphs followed by comments. The study participants were one hundred and eighty three.

4.2 Data Presentation and Analysis

Table 1: Demographic Distribution of Participants

Characteristic	Frequency	%N=183
Sex		
Male	62	33.88
Females	121	66.12
Age	15	8.20
15-25years	31	16.94
25-34 years	53	28.96
35-44 years	42	22.95
45-54 years	36	19.67
55-65 years	6	3.28
65 and above		
Marital Status		
Single	24	13.11
Married	125	68.31
Divorced /separated	22	12.02
Widowed	12	6.56
Level of education		
Not educated	21	11.48
Primary	93	50.82
Secondary	65	35.52
Tertiary	4	2.19
Disability status		
Yes	10	5.46
No	173	94.53

The total number of participants was 183 from five wards that were under study in Chiredzi District of the participants 131 (66.12%) were females whist62(33.88%)were males .The mean age of participants was 45 years and the median age was 38.7 years .The majority of participants were aged between 25 to 54 years were 131 participants(71.58%. The average members in a family is four. Most respondent were married 125(68.31%).10(5.46%) of respondents are living with disability.

4.2.1 Knowledge of participants on water borne diseases

The participants were asked if they knew water borne diseases 167 participants (91.26%) answered " yes "whist 16 (8.74%)had never heard the term. Most female had basic knowledge of diarrheal diseases 98 (75.0%) There was a significance difference in knowledge of water borne diseases according to sex since the p value was 0.02.

The overall knowledge on Water, Sanitation and Hygiene was assessed through the knowledge and presentation of views and responses by the key respondent at each household .The table below shows the results.

Table 2 Knowledge level on WASH

Knowledge on WASH	Frequency	Percent
above average	114	62.64%
below average	64	35.16%
excellent	2	1.10%
no knowledge	2	1.10%
Total	182	100.00%

Cholera condition was the most common disease known with 160(78%) of the participants reporting that they had either had the disease or a member of

the family had died in 2008..The second most condition is diarrhoea for under five years which had 48 (23%) of people reporting that a child had diarrhoea for the past month.. The least known condition is dysentery that had 32 (18%).The participants were 131 (66.12%) females whist 62(33.88%) were males. Gender was not statistically associated with contacting water borne diseases the p value =0.023.Educational level being attained was associated with reduced contact of water borne diseases [COR: 0.26(95%CI: 0.19-0.37) p<0.001.

4.2.2 Knowledge on mode of transmission

On the mode of transmission 115(63%) respondents reported that they know that communicable diseases could be spread from one person to another. 44(24%) thought that they could not be spread from one person to another .About 27(14%)they did not know that the diseases can be transmitted from one person to another though the discharges from an infected person.

4.2.3 Knowledge of water quality as a risk factor for water borne

The majority of participant recognises water quality as a risk factor for diarrheal diseases and majority did not recognise water quality as a risk factor for cholera and dysentery.

4.4. Water sources

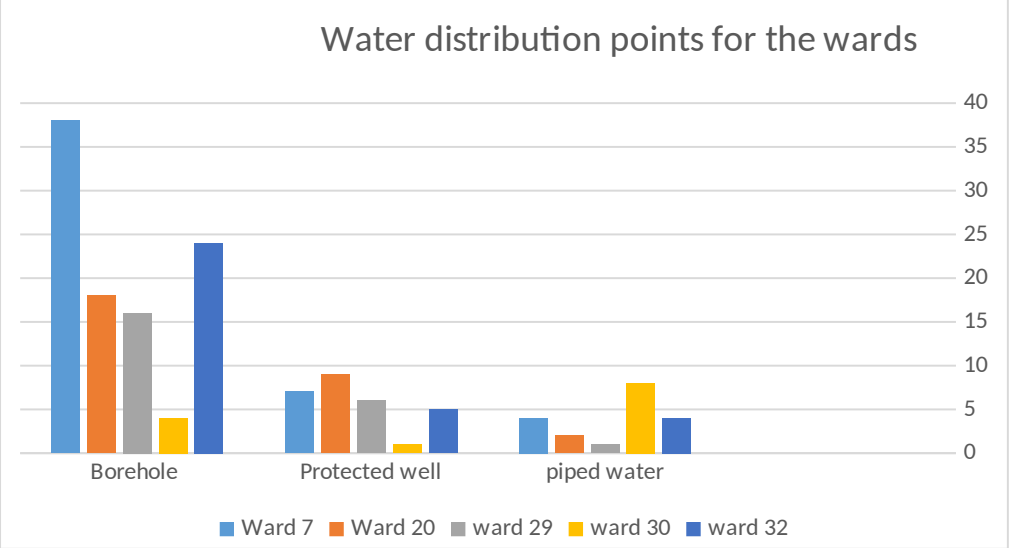

Figure 4: Distribution of water sources per ward

From the above chart ward 7 has the highest number of boreholes as compared to other ward. Ward 30 has the least number of borehole because it is a farm. The number of protected well is high in ward 20 .Ward 30 has more piped water than the rest of the wards.

Table 4: Sources of water from respondents

Sources of water	Frequency	Percent
Borehole	86	48.31%
Dam	12	6.74%
Protected well	14	7.87%
River	37	20.79%
Piped water	16	8.99%
Unprotected well	13	7.30%
Total	178	100.00%

Boreholes water source is the main drinking water for the sampled households with 88(48.31%), 53(28.79%) obtain water from rivers.12 (6.74 %) obtain from dams and 13(7.3%) from unprotected wells, which pose the

community to be at a high risk of contracting water borne diseases. About 68(37%) of respondents with secondary and tertiary education drink water from protected sources. For households that do not have piped water mothers and girls take the leading role of collecting water.

4.5 Practises of participants on prevention and control of water borne diseases.

All participants agreed that hand washing is one of the key elements of healthcare recommendations for standard precautions, the main reason to prevent transmission of faecal oral diseases

Table 5 Handwashing at critical times

Hand washing	Frequency	Percent
after visiting the toilet before and after eating	168	92.31%
after visiting the toilet only	2	1.10%
before and after eating only	12	6.59%
Total	182	100.00%

168(92.31%) of respondents indicated that they wash hands at critical times only .Only 2(1.10 %) of respondents do not constantly wash their hands with soap and water.12 (6.29%) only wash hands before and after eating food.

Table 6 Treatment of drinking water.

Water treatment	Frequency	Percent
No	114	70.37%
Yes	48	29.63%
Total	162	100.00%

48 respondents (29.63%) of household treat their drinking water whether it is from a protected source or not to ensure that the family is safe from contamination. Most respondents 114(70.37%) indicated that they do not treat their drinking water whether it is from protected or unprotected sources.

Table 7 Frequencies for salt and sugar solution preparation

Salt and sugar solution	Frequency	Percent
No	64	35.36%
Yes	117	64.64%
Total	181	100.00%

117(64.64) of respondents said that they know how to prepare salt and sugar solution at home whist 64(35, 36) they do not know how to make salt and sugar solution.

4.6 Improved sanitation services

Table 8 Disposal of excreta

Presence of latrine	Frequency	Percent
Blair Latrine	37	20.33%
Pit Latrine	68	37.36%
Flush Toilet	12	6.59%
Bush	64	35.16%
Cat Sanitation	1	0.55%
Total	182	100.00%

The table above shows the percentage of people who are safely deposing their faecal material and 0.55% indicated that they use cat sanitation. Most respondents without latrines indicated that they are sharing with the ones that they have.

Table 9 Waste management

Waste disposal	Frequency	Percent
Burn	5	2.78%
Drainage	1	0.56%
Outside the yard	41	22.78%
Refuse Pit	133	73.89%
Total	180	100.00%

The tables shows that 133 (73.89%) of respondents have refuse pit latrines. Through observation some refuse pits were full and most refuse pits are mixed together .no waste segregation is being practised.41 (22.78%) just through their rubbish outside the yard. Limited number of respondents burn their waste.

Table 10 Hygiene promotion

Health promotion facilitator	Frequency	Percentage
Village heads	2	1.09%
local E.H.T	59	32.24%
PHHE promoters	62	33.88%
village health worker	60	32.79%
Total	183	100.00%

From the table above most respondents rely on Participatory Health and Hygiene Educators (PHHE) and Village Health Workers (VHW) who facilitates health session in Community Health Clubs (CHC) .The local Environmental Health Technician (EHT) plays also an important role in community awareness programs.

Latrine construction support	Frequency	Percent
NO	150	85.71%
YES	25	14.29%
Total	175	100.00%

Table 11.Support towards latrine construction

Table 12.Presence of a pot rack as safe practice

Presence of a pot rack	Frequency	Percent
No	54	30.00%
Yes	126	70.00%
Total	180	100.00%

From the study 54(70%) of respondents have pot racks and 126(30%) do not have pot rack.

Table 13.Responsibility for Water collection

Responsibility for collecting water	Frequency	Percent
Boys	16	8.74%
Everyone	25	13.66%
Father	7	3.82%
Mother	30	16.39%
Mother And Girls	105	57.38%
Total	183	100.00%

The role of water collection proved to be a burden for women and girls at home, this is shown on table above where 105(57.38%) of respondents said that. About 25(13.66%) of respondents cited that it is a responsibility for every family member to collect water .7(3.82%) of respondents said it is the role of a father to ensure that water is available at home. The adoption of safe practices like drawing water from safe sources, practicing household water

treatment, and construction and safe use of sanitation facilities play critical role in reduction of water borne diseases.

Table 14 Linear Regression Analysis

Variable	Coefficient	95%confidence	Limits	Std Error	F test	p-value
Disposal of excreta	-0.025	-0.130	0.080	0.053	0.2257	0.635331
Water source	0.019.	-0.019	0.056	0.019	0.9724	*0.00255
Drawing of drinking water	0.005	-0.049	0.060	0.028	0.0391	0.844363
Hand washing with soap	-0.219	-0.381	-0.057	0.082	7.1289	*0.008299
Constant	0.761	0.619	0.903	0.072	112.2019	0000000

Correlation coefficient

Source	df	∑ of squares	Mean square	F-statistic	p-value
Regression	4	1,5654	0.3913	2,1131	0.0814
Residuals	165	7430.5582	0.1852		
Total	169	32.1235			

The study proves that communities adopt positive health behaviour to water, sanitation and hygiene if they adhere to promotional activities in the community. Accessibility of safe water sources Availability of supporting staff Availability of boreholes spares Availabity of Village pump mechanic

FOCUS GROUP DISCUSSIONS FINDINGS

There are several capacity issues at the local level which are affecting water security and water governance. In terms of coordination at the ward level, there are ward councillors as well as the WWSSC which all coordinate activities related to WASH. Though ward councillors and the WWSSCS are

in place, these do not have budgets which they control regarding the implementation of WASH activities. These institutions cannot drill or rehabilitate boreholes. They would have to simply watch as their people struggle with issues related to water supply, sanitation and hygiene. A ward councillor simply forwards all challenges to the RDC full council where they are simply told that there are no financial resources for borehole drilling or rehabilitation. Regarding water point committees, it is commendable that the majority of water users are women who constitute the bulk of the water users.

However, for water points, some boreholes are not functional and one of the factors behind this is ineffective committees. At times water points break down permanently mainly because the committees would have engaged untrained pump minders. In some cases, the boreholes develop major problems which need DDF maintenance teams, but such problems are not reported on time.

In some instances beneficiaries refuse to contribute either labour or financial resources in order to enhance the functionality of the water points. Some of the boreholes developed minor problems and beneficiaries refused to contribute money to buy some spare parts. With time, the boreholes broke down permanently. This results in those beneficiaries with broken down boreholes either going to the nearest functional water point thereby putting pressure on such points, or resorting to fetching water from protected sources.

In order to ensure functionality of water points, DDF and development partners have been involved in the training of village pump minders (VPMs). The VPMs are trained to do simple maintenance like changing leather cups,

greasing and fishing rods which would have fallen down the boreholes. The VPMs are provided with tools which are kept at a central point like a school or a clinic where each VPM who needs them has to sign for them.

Though there are pump minders who have been trained in the communities, most of these are men who can be highly mobile. Due to the difficult prevailing economic environment, some of the pump minders once they receive technical training they cross the border either to South Africa or Mozambique where they can be marketable. This leaves the communities vulnerable as broken down boreholes are not fixed on time. However, the pump minders who move out of the communities are not able to go away with the tools as they do not stay in their custody.

However, there are breakdowns which require major repairs which the communities cannot handle and would require spare parts and expertise from DDF. In such cases, DDF might not have the spares to fix the boreholes and this results in the water point going for longer times without being repaired.

Despite the fact that women and girls are the major water users, they are poorly represented in positions of decision making in water governance. However, a few women are occupying key positions which enable them to take key decisions.

GAPS THAT NEED TO BE ADRESSED

i. There are limited water supply sources for domestic purposes in resettlement areas forcing the households to rely on unprotected sources or to walk very long distances which can be up to 10 km to fetch water or to use unprotected sources;

ii. High number of broken down boreholes forcing household members either to use unprotected sources or walk longer distances to functional boreholes;

iii. Due to high number of broken down boreholes, households are forced to fetch water from the Save River risking their lives from attacks by crocodiles;

iv. Lack of initiative on the part of households to embark on proper rainwater harvesting;

v. Drinking poor quality water from unprotected sources and salty water from some of the boreholes;

vi. Limited women village pump minders for boreholes and builders for the construction of toilet facilities;

vii. Women's dignity being violated as they are forced to bath in the open along rivers and streams;

viii. There is limited access to productive water for irrigation purposes by households in communal areas as the bulk of the water is being accessed by big estates

ix. No major programmes to promote sanitation, health and hygiene in resettlement areas as only 18% of the population in the District have access to toilets and only 5% have hand washing facilities;

CHAPTER 5 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter addresses the results and summary of the study. Basing on the literature review and the study findings the discussion will therefore address findings as reflected in the results with special emphasis towards answering the research questions. Recommendations that emanated from this study are also highlighted.

5.2 Discussion

5.2.1 Demographics

The majority of the participants (68.55%) were in the range 25 years to 65 years with few outliers on both sides. This was caused by the inclusion and exclusion criteria that were not age restricting on the key respondent on each household. All the wards who participated in the study are located in rural areas .This setup could not therefore offer comparisons for assessing practises of people in urban set up.

5.2.1 Knowledge of participants on water borne diseases

From other studies done it has been reported that individuals with knowledge on communicable diseases were likely to exhibit positive health behaviour and practises compared with those with little or no knowledge at all(Chingatichifwe,Dodge,Chideme-Munodawafa,Mwale &Bvumbwe,2014). More than half of the respondents reported having heard about water borne diseases and the transmission mode of the diseases. This study did prove any statistically significant difference between sexes on knowledge of waterborne

diseases. Other studies done in Sub Saharan African countries also revealed low levels of water borne diseases among marginalised communities. The high knowledge on transmission may be more to do with high education level of the respondents since educational level being attained was associated with reduced contact of water borne diseases [COR: 0.26(95%CI: 0.19-0.37) p<0.001. The investigation encountered some situations in which the village health workers presented high level of education on water borne diseases. This supports that the level of education is a contributing factor in the control and prevention of water borne disease.

The respondents had shown high level of education on common diarrheal and cholera .The result was consistent with that reports by Baker(2014) who also cite that dysentery was the most common condition among water borne diseases. The high level of knowledge of individuals displayed in the study may be attributed to awareness campaigns through mass media. The level of knowledge of risk factors reported in the cited studies is low among communities. This therefore points to the need of extensive education and health promotion massages for the communities.

Knowledge of the diseases would also have been due to community contact with individuals who have suffered any of the diseases especially cholera and typhoid. Still a high proportion of the participants could not relate to the communicable diseases since 49% did not know or agree that these conditions were communicable from one person to another.Understading of a condition and its mode of transmission is important for prevention and control strategies.

Although the level of risk factors reported in the current study seem to be high, it may not be necessarily associated with health factors but rather moral issues. It is therefore important for health promotion and education to be prioritised so that the majority of the people in the community may appreciate the risk factors and their likely to the spread of communicable diseases. There is need to devise innovative mechanisms to educate the wider community in the relationship between lifestyle and diseases.

5.2.2 Practises of participants on prevention and control of water borne diseases

The study revealed that the majority of participants do not practice basic hygiene measures to prevent and control the transmission of water borne diseases.it is clear from findings that preventative measures are not taken seriously in the community. The have the knowledge but practices are insufficient. Many inadequacies stemmed from lack of sanitation policy for the Chiredzi Rural District council community. Households require water on a daily basis for different purposes such as drinking, cooking, personal hygiene, cleaning of the house, washing clothes and irrigation and drinking for livestock.

Sanitation measures that include the safe disposal of excreta, safe disposal of solid waste and control of insects and rodents. Hygiene promotion involves the use of water, sanitation and hygiene facilities provided to ensure the combating of the faecal oral diseases. The peoples existing knowledge, practices and attitude towards interventions has a high impact in reduction of diarrheal diseases. Inconsistent safe water supply is a serious threat to life as

it causes a lot of health problems and in most cases leading to outbreaks of diarrheal diseases such as cholera, typhoid and dysentery.

Hygiene promotion involves the use of water, sanitation and hygiene facilities provided to ensure the combating of the water borne diseases. This diminished the quality and reliability of services, culminating in the 2008-2009 cholera outbreaks, which resulted in more than 100,000 cases and over 4,300 deaths countrywide (UNICEF, 2010).. According to (Sphere,2011) the water, sanitation and hygiene programmes reduce the transmission of water related diseases and their exposure through the promotion of good hygiene practices, provision of safe drinking water and provision of safe sanitation.

The study results have shown some association between knowledge of water borne diseases and some practises such as open defecation (OR=0.92);P=0.87).The associations were statistically significant .This could have been because the knowledge was basic for prevention and control of water borne diseases. The knowledge basic and not because of structured education. Other studies have shown that risk factors obtained from a structured education program were likely to exhibit health practises (Elstin,Dsouza & Roach ,2014).It is therefore important for structured education to waterborne diseases to be incorporated into the school curriculum to catch them young and for communities to have Participatory Health Hygiene Education Sessions in their communities.

5.2.3 Attitude of participants towards risk factors

Attitude towards a variable determines how easily an individual can modify his or her behaviour. from the results of this study ,it is worrying to note that

a large proportion of participants have some negative attitude towards health behaviours .A significant number of participants either agreed or strongly agree that handwashing with soap at critical times is very effective in the prevention of water borne diseases yet they do not practise it. Attitude has been reports to influence practises shown by Mubaiwa (2014) who report a positive Pearson correlation between attitude level and practice level in the study on knowledge, attitude and practises towards water related diseases. Females were reported to be more likely to exhibit positive attitude towards risk factors compared to male counter parts with percentages of 34.2% and 20, 6% respectively.

Misconceptions should be addressed and correct information be disseminated especially on water quality of borehole water since a significant number of respondents prefer to drink raw water from dams and rivers. Health professionals should play an active role in encouraging and disseminating accurate information water quality. Health education talks in schools and community should be encouraged.

The situation in both wards result in household's members, mainly women and girls, walking as much as 6km in search of water.()Many households resort to fetching water from rivers, Fetching from rivers is very dangerous as some people have been killed or maimed by crocodiles. Women and girls are frequently responsible for WASH at household level therefore an understanding of gender dynamics and traditional roles is necessary for successful programs in a community. Lack of sanitation facilities for girls reaching puberty makes them more likely to miss school than boy's .Women

and girls are more likely to be responsible for collecting water for their families (UNICEF, 2019)

The challenges in access to clean water is a pre-condition for good health, thereby contributing to the reduction of mortality and morbidity as a result of WASH-related diseases, reduction in the burden of water collection for women and girls. Failure to provision of safe drinking water and provision of better sanitation facilities may result in reoccurrences of cholera, diarrhea and other water related diseases (UNICEF, 2013).

Some of the villagers have their own shallow and deep wells. Most of them they are not protected. Those with perennial wells are able to establish nutritional gardens.

5.2.4 Determinants for prevention and control of water borne diseases

Improve of water and sanitation Lack of sanitation can lead to transmission of water borne diseases, contamination of water sites and provide a breeding ground for vectors that may carry the infection

-increase access to water by drilling of boreholes and upgrading to piped water schemes.

Several dimensions of water security have to be fulfilled if water security is to be achieved in developing countries .These include water availability, accessibility and quality and quantity of the resource. Helping communities fetch water from protected sources promote good health and safe water proved to be essential service during this Covid -19 pandemic. There is

widespread water in security in both wards, both wards receive very low rainfall, below 400mm per annum .However, in good years it can get up to 700mm per annum.ward total boreholes functional and non-functional. When the borehole is not functionality put pressure on functional boreholes. The situation forces households to access water from unprotected sources like Runde River and Chiredzi River .During the dry season the boreholes might not be able to yield enough water this also forces villagers to resort to unprotected water sources.

Previous literature has shown considerable studies regarding the effects of appropriate water facilities, handwashing and hygiene practises on health outcomes especially children. Impaired cognitive learning and learning performance are long-term outcomes of the negative effects of infections such as diarrhoea, worm infestations, and dehydrations that are largely attributed to poor water, sanitation, and hygiene conditions (UNICEF, 2020). Water quality monitoring and control is also important in ensuring safety and suitability. Understanding community attitudes and perceptions towards water safety, sanitation and hygiene will help planning appropriate health and hygiene promotion as well, safe water, and sanitation provision in Chiredzi District and other places where the same could be applied. Accessibility level of water, sanitation and hygiene services

The outcome practices, knowledge and attitudes that result from the increased health and hygiene knowledge as evidenced by-

i. safe practices like drawing water from safe sources,
ii. practicing household water treatment,

iii. Safe water drawing methods from container

iv. Safe storage of drinking water

v. Construction and safe use of sanitation facilities

vi. Improved general hygiene at households

5.2.5 Implications

A safe, reliable, affordable, and easily accessible water supply is essential for good health. Yet, for several decades, about a billion people in developing countries have not had a safe and sustainable water supply (UNICEF, 2018). The lack of improved water supply and sanitation severely affects the human capabilities of all Zimbabweans. Improved sanitation prevents human contact with excreta. Without clean water and proper sanitation, human beings are more prone to contracting illnesses, and therefore suffer greater rates of morbidity and mortality due to these illnesses. Improved water supply and sanitation services are highly effective at reducing the rates of morbidity and mortality for many illnesses including cholera, diarrhea, hookworm infection, schistosomiasis, and trachoma. Diarrhea is an especially serious disease considering it is the largest killer of children under the age of five in Africa.

5.3 Conclusion

Water is critical for sustainable development, including environmental integrity and the eradication of poverty and hunger, and is indispensable for human health and well-being. Sustainable management of water resources is seen as vital for economic growth, public health, food security and stable

societies. Access, availability and affordability to water and sanitation, is seen as essential for sustainable development and poverty eradication

Although a high proportion of the participants reported routine hand washing before and after visiting a toilet, supporting infrastructure such as availability of portable water and soap for handwashing is not readily available in the community. Results generated could be useful and beneficial to the community, health care providers and policy makers in Zimbabwe. The results of the study, if implemented they will help in the reduction of water borne diseases which are a matter of Public Health concern. The specific interventions necessary to prevent the water borne diseases are well known that they include good hygiene, proper disposal of sanitation and provision of portable water for drinking. Sanitation and hygiene promotion is of paramount.

Water security and governance issues have also seen communities failing to access water sources due to competition for the scarce resources. This can result in conflicts within and between communities and water governance structures and users. Good governance is closely linked to the role of stakeholders in the management, use and allocation of the resource. Pricing and affordability also determine access to water for household use. Water pricing is an instrument to achieve financial sustainability, as water supply can only be sustainable if the financial costs are recovered from those accessing and using them.

5.4 Recommendations

After carrying out this research and analysing the results, the researcher, therefore makes the following recommendations, which, if taken to the stakeholders, may reduce the incidence of diarrheal diseases.

Local Authorities should ensure that they have sanitation supporting by laws which include the construction of latrines .Policy makers should ensure enforcement of the policies and bylaws.

Ministry of Health and Childcare through the Health Promotion Officers (HPO) and (District Environmental Health Officers (DEHO) should ensure that the communities and school health coordinators are embraced with updated information on water borne diseases in their areas and ensure preventive and awareness programs are done in the community .

Ministry of Education to ensure inclusion of water borne diseases in the curriculum .The school health coordinators should ensure that the School Health clubs are active.

Ministry of Women Affairs should ensure inclusion of women and girls .Gender mainstreaming programs should be introduced in the community and strengthened to ensure sustainability of programs.

5.5 Suggestions for Further Studies

This study was done with participants in five rural wards, hence the need to do a study in urban areas to come up with view of urban residents.

Regarding the disparity between knowledge and practice, this study recommends further studies to be carried out in order for the communities to come up with more sustainable ways for participatory health and hygiene

education for the communities. A detailed and comprehensive study on each of the risk factors can be taken at national level to enable policy makers to come up with workable guidelines to control water borne diseases in Zimbabwe.

5.6 Limitations of the Study

The study was done in five wards of Chiredzi District that include the clinics in the study area. The participants sampled will not be fully representing the geographical population of the district but covered self-contained estates and farms, which include Hippo valley. The urban wards were no due to done time for the researcher to ask for permission from relevant authorities. However, the urban wards are not speared from the water scarcity and poor sanitation services that contribute to the increase of diarrheal diseases in the district.

5.7 Dissemination of Results

The results of the study were disseminated to the Provincial and District Water Sanitation Sub Committees (DWSSC)

.Authorities gave assurance the recommendations for PHHE in communities, formulation of health clubs will be considers in full council meeting, and resolution will be passed.

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Appendices

Appendix I: Informed Consent form- English version

Consent Form

Introduction

My name is Phillina Mukaro I am a student from Africa University attached Chiredzi Rural District Council. I am currently conducting a research on the knowledge, attitude and perceptions towards Water, Sanitation and Hygiene (WASH) of Zimbabwe a case study of Chiredzi District 2021

The purpose of this study is to assess the level of knowledge of WASH among the communities in Chiredzi District and to access the attitude of communities towards risk factors for WASH diseases in the study area I need to assess the perceptions and the practices towards risk factors for WASH related diseases among the communities

Type of research intervention

The research will involve me asking you a few questions for about 30 minutes. The questions involve your concerns and experiences in water, sanitation and hygiene. Some of the questions involve personal and confidential information. Feel free to stop me at any question if you feel uncomfortable with the questions.

Benefits

There is no financial benefit for you participating in the study but the information we get may be used by policy makers to formulate policies that can help communities to access water and sanitation services.

Confidentiality and consent

Your name shall not be obtained during this interview and your answers are confidential. You do not have to take part in this interview if you do not want to answer any questions that you are not comfortable with. You have the right to end the interview at any time you want to.

Sharing the Results

The results of the study will be shared with the Chiredzi Health Team including all the health stakeholders responsible for water sanitation and hygiene and Africa University faculty, but nothing in the report will be attributable to you.

Right to Refuse or Withdraw

As mentioned earlier, you have the right to refuse or withdraw from the study at any time. You will not be penalized for that.

Who to Contact

If ever you think or find something you may want to discuss or share after the interview, feel free to contact me. You may ask me any questions if you want.

Part II: Certificate of Consent

Having been invited to take part in the study, I have read the above information and understood it. I was given a chance to ask questions where I did not understand and the questions were answered to my satisfaction. I therefore, voluntarily consent to take part in the study.

Do you consent to be interviewed? Yes ☐ No ☐

If no written informed consent is granted, do not proceed with the interview

Participant Signature……
Date……..

Investigator's
Signature……...Date……
.

Appendix 2: Informed Consent Form - Shona Version
Nhanganyaya

Zita rangu ndinoitwa Phillina Mukaro Ndiri mudzidzi wepa Africa University, mukuzadzikisa zvidzidzo zvangu ndiri kuda kuitawo wongororo maererano nezvatinofunga uye zvatinoziva nezvemvura uye ustanana munharaunda dzatinonagara. Donzvo rewongororo iyi nderekuda kuona zvatigagadzirisa kuderedza zvirwere zve manyoka. **Chinangwa cheongororo** ndechekuda kuziva ruzivo rune vagari vemunharaunda ye Chiredzi maringe nemaonero avanoita zvingakodzeresa zwirwere zvinokonzereswa nekusawanikwana kwemvura yakashambidzika uye kushaikwa kwezvimbudzi munharaunda.

Maitirwe eongororo

Muongororo muchabvunzwa mibvunzo ingatora chinguva chinenge minhasvi makumi matatu. Mibvunzo iyi inosanganisira zvimwe zvamunosangana nazvo nemafungiro enyu maererano nekuwaniswa kwemvura yekunwa yakachena uye kuvandudzwa kwe hutsanana Mimwe yemibvunzo yacho inogona kuva yezvakakosha nezvakavanzika zvenyu. Sunungukai kundimisa pane upi zvawo mubvunzo kana monzwa kumanikidzika kupindura mubvunzo wacho.

Mubairo

Kupinda muongororo iyi kahuna mubairo wemari kana chimwe chinhu. Zvichabuda muongororo zvinogona kushandiswa nevatungamiri vezvemutemo kuti zvikubatsirei kuti kuderedza zvirwere zvemanyoka

Tsindidzo
Humbowo huchabuda muongororo nenhaurwa dzose zviri pakati penyu neni. Hakuna mumwe munhu asiri muongororo ino achaona zvatatauririana. Gwaro nyorwa richabuda muongororo iyi harizoratidzi zvatatauririana izvi uye hapana chichanongedza kwamuri.

Kugoverwa kwezvichabuda muongororo

Zvichabuda muongororo zvichapiwa kuvatungamiri zveutano mudunhu reMasvingo nevadzidzisi vekuAfrica University. Imi munogona kuziva zvabuda musarudzo pamunouya.

Nonzero yekuramba kana kubuda muongororo

Sekurehwa kwazvamboitwa kwekutanga kwegwaro rino mune kodzero yekuramba kupinda muongororo kana kubudira pamunoda. Hamuzombopiwa mhosva yekuramba kana kubuda muongororo.

Kana mukada wekutaura naye

Mukanzwa kuda kubvunza mimwe mubvunzo nyangwe mushure menhaurirano ino sunungukai kundibvunza kana kubvunza vana mazvikokota venyu vanokubatsirai pakiriniki pano. Kana pane zvimwe zvamungada kubvunza bvunzai zvenyu.

CHITUPA CHEMVUMO YEKUPINDA MUONGORORO

Mushure mekunge ndaziviswa nezveongororo iyi uye ndakumbirwa kupinda muongororo, ndaverenga mashoko akanyorwa pamusoro apo ndikaanzwisisa. Ndapiwa mukana wekubvunza pandanga ndisinganzwisise uye zvatsanangurwa zvandigutsa. Nekudaro ndinozvipira zvisina kumanikidzwa kupinda muongororo iyi.

Munobvuma here kupinda muurongwa uyu? ☐ Hongu ☐ Kwete

Kana pasina mvumo yapihwa wongororo haienderere mberi.

Rupawo rwomubatsiri……Zuva……

Rupawo rwomudzidzi……...Zuva……

Appendix 3: Questionnaire

Individual questionnaire Number …….

Question	Record	Notes
Personal		
1. Date		
2. Gender		1=Male 2= Female
3. Age		
4. Marital status		
5. How many people are in your household		
6. What was the last grade /standard achieved		
7. What religious group do you belong to		
8. What social groups do you belong to		
9. Have you recently received any help from NGO towards building a toilet		1=No ,2=Yes
Water		
10.How far is your nearest drinking water source		1=Less than 0.5km, 2=0,5 to 1km 3=1.1 to 2km 4=More than 2km
11.From what source do you obtain drinking water		0 =Unprotected 1=Protected
12.Do you treat your drinking water		1=No, 2=Yes
13.Do they use safe water storage containers (properly sealed and/or narrow neck?		1=No, 2=Yes
Sanitation		
14.What toilet does this household use?		1=Bush Toilet, 2= Pit Toilet, 3=Latrine
15.When was this toilet constructed		1=No ,2=Yes
16. What did they use before that?		1=No ,2=Yes

Hygiene promotion		
17. Does the house have a pot rake?		1=No ,2=Yes
18. Do you use soap to wash your hands?		1=No ,2=Yes
19. Do you have a bathroom?		1=No ,2=Yes
20.Do you have a mosquito net		1=No ,2=Yes
21.Do you know how to make salt and sugar solution		1=No ,2=Yes

Appendix 4: Mibvunzo yeongororo muchishona

Mibvunzo yemunhu Chinongedzo

…….

Mubvinzo	Zvabuda	Mhinduro
Ruzivo maererano nemunhu		
1. 1.Zuva		
2. Munhiyi		1=Murume 2= Mukadzi
3. Makore		
4. Mamirero		
5. Munogara murivangani		
6. Makasvika gwaro rechingani pakudzidza		
7. Chtendero chenyu		

chinonzi chii		
8. Mamwe vamunotandara navo ndevapi		
9. Makambopihwa rubetsero rwekuvaka chimbuzi		1=kwete ,2=hongu
Mibvinzo maringe nemvura		
10.munofamba nhambo yayareba sei kunotora mvura		1= 0.5km, 2=0,5 - 1km 3=1.1 - 2km 4=kudarika 2km
11.munoiwana payi		1 =haina kuchengetedzwa 2 =yakachengetedzwa
12.munorapa mvura nyenyu hrer		1=kwete ,2=hongu
13.munoshandisa chii kutora mvura yekunwa		1=kwete ,2=hongu
Mibvunzo maringe nehutsanana		
14.munoshandisa chimbudzi chakaita sei		1=sango, 2= chimbudzi , 3=gomba
15.chimbudzi chavakwa mugore ripi		
16. maimboshandisa nzira ipi		
Hutano kwepamusha		
17. Munedara rendiro here?		1=kwete ,2=hongu
18. Munogeza maoko nesipo here?		1=kwete ,2=hongu
19. Munogezera Payi?		1=Kwete ,2=Hongu
20. Mune mumbure Here?		1=Kwete ,2=Hongu
21. Munogona kugadzira mvura yemunyu neshuga?		1=Kwete ,2=Hongu

Appendix 5: Focus Group Discussion Guide.

Questions for a Focus Group on perceptions towards water safety, sanitation and personal hygiene.

1. Describe the water, sanitation and hygiene programs that have run in your community over the years.

2. What has changed because of the programs in your community?

• Water-is it safe/ does it need improvement/ what improvements?

• Sanitation-Is it safe/ optimum?

• Hygiene-what do people do about this?

• Water and sanitation related illnesses. Are any ill of water and sanitation diseases in the past months?

3. What, in your community has not changed in spite of the programs?

4. What aspects of the programs have you liked most? Why?

5. What aspects of the programs have you liked the least? Why?

6. Who has supported the programs?

7. How have you been involved in the WASH programs?

8. Do the programs self-sustain? Why and why not?

9. If you were responsible for planning WASH programs in your area, what would you include? What would you leave out?

10. Is there anything else you would like to say about the water, sanitation and hygiene programs in your community?

Appendix 6: FOCUS GROUP DISCUSSION SHONA

Mibvunzo maerenano nemaonero amunoita nhau dze mvura, utano nehutsanana

1. Munharaunda menyu zvirongwa zvemvura, utano nehutsanana munozvifambisa sei makore ose apfuura?
2. Pane shanduko here yamuoona mudunhu menyu nekuda kwezvirongwa izvi?
    - Panyaya yemvura yekunwa chii chingada kuvandudzwa?
    - Panhau ye hutano chiii chingada kuvandudzwa
    - Pahutsanana vagari vemunharaunda vanoitei kuti huvandudzike
    - Nde zvipi zvirwere zvinokonzerwa nekunwa mvura isina kushambidzika uye hutano ne hutsanana
3. Mumwedzi mitanhatu yapfuura ndezvipi zvirwere zvakanyanya kuwanda mudunhu renyu?
4. Ndezvipi zvisina kushanduka kunyangwe zvirongwa zviripo?
5. Ndezvipi zvakamakafarira pazvirongwa uye nechikonzero chei?
6. Ndezvipi zvamusina kufarirarapazvirongwa izvi uye nechikonzero chei?
7. Rutsigiro rwezvirongwa mairwuwanepi?
8. Maibetsera sei kuti chirongwa chifambe zvakanaka?
9. Zvirongwa izvi zvicharamba zvichibudirira here uye nenzira ipi?
10. Kana mune mukana wekuronga zvirongwa zve mvura,utsanana nehutano ndezvipi zvamungaisa uye ndezvipi zvamungasiya ?

APPENDIX 7: Approval letter from Chiredzi Rural District Council

CHIREDZI RURAL DISTRICT COUNCIL

CHIREDZI RURAL DISTRICT COUNCIL
P O BOX 128
CHIREDZI

Phone:031-2547/2765
Fax:031-2596
Email: ceo@chiredzirdc.org.zw

COUNCIL OFFICES
69 INYATHI ROAD

All correspondences are addressed to the Chief Executive Officer

19 January 2022

The MPH Student Coordinator
Africa University
College of Health, Agriculture and Natural Resources
Mutare

RE: REQUEST FOR PERMISSION TO CARRY OUT A RESEARCH: PHILLINA SAKHILLE MUKARO REG. NO.180046

The above subject matter is certainly paramount:

This letter serves to inform you that Chiredzi Rural District Council has no objection to your application to carry out a research in its area of jurisdiction.

You are therefore granted permission to proceed with the process of conducting the intended research.

We also request a copy of the research after the process for council information.

Your usual co-operation would be profoundly appreciated.

Yours faithfully

V. Magumbe
For: Chief Executive Officer
Chiredzi Rural District Council

CHIEF EXECUTIVE OFFICER
CHIREDZI RURAL DISTRICT COUNCIL
2022 -01- 19
69 INYATHI DRIVE
P.O BOX 128
CHIREDZI
TEL: 031-2547

VM/pc

AUREC APPROVAL LETTER

Investing in Africa's future

AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC)

P.O. Box 1320 Mutare, Zimbabwe, Off Nyanga Road, Old Mutare-Tel (+263-20) 60075/60026/61611 Fax: (+263 20) 61785 website: www.africau.edu

Ref: AU2525/22 30 March, 2022

MUKARO PHILLINA SAKHILLE
C/O CHANS
Africa University
Box 1320
MUTARE

RE: KNOWLEDGE, ATTITUDE AND PERCEPTIONS TOWARDS WATER, SANITATION AND HYGIENE AMONG COMMUNITIES OF ZIMBABWE: A CASE STUDY OF CHIREDZI DISTRICT, MASVINGO PROVINCE, 2021

Thank you for the above titled proposal that you submitted to the Africa University Research Ethics Committee for review. Please be advised that AUREC has reviewed and approved your application to conduct the above research.

The approval is based on the following.
a) Research proposal
b) Data collection instruments
c) Informed consent guide

- **APPROVAL NUMBER** AUREC 2525/22
  This number should be used on all correspondences, consent forms, and appropriate documents.
- **AUREC MEETING DATE** NA
- **APPROVAL DATE** March 30, 2022
- **EXPIRATION DATE** March 30, 2023
- **TYPE OF MEETING** Expedited
  After the expiration date this research may only continue upon renewal. For purposes of renewal, a progress report on a standard AUREC form should be submitted a month before expiration date.
- **SERIOUS ADVERSE EVENTS** All serious problems having to do with subject safety must be reported to AUREC within 3 working days on standard AUREC form.
- **MODIFICATIONS** Prior AUREC approval is required before implementing any changes in the proposal (including changes in the consent documents)
- **TERMINATION OF STUDY** Upon termination of the study a report has to be submitted to AUREC.

AFRICA UNIVERSITY
RESEARCH ETHICS COMMITTEE (AUREC)
APPROVED
P.O. BOX 1320, MUTARE, ZIMBABWE

Yours Faithfully

MARY CHINZOU –
ASSISTANT RESEARCH OFFICER: FOR CHAIRPERSON
AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE