ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

THE IMPACT OF WASH PROJECTS ON THE ALTITUDE AND PRACTICE OF REFUGEES:

THE CASE OF SHIRE REFUGEE CAMP.

BY

BETSELOT MENGESHA

June 2020

ADDIS ABABA, ETHIOPIA

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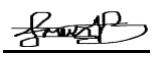
Maru Shete (PhD)	 **15/08/20**
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DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Dr. Muluadam Alemu (PhD). All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted for any degree.

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St. Mary's University, Addis Ababa June 2020

ENDORSEMENT

This thesis is submitted to St. Mary‘s University, School of Graduate Studies for examination with my approval as a university advisor.

Muluadam Alemu (Ph.D) 

Advisor Signature

St. Mary’s University, Addis Ababa June 2020

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ACRONYMS

AWD	Acute Watery Diarrhea
CHWs	Community Health Workers
ECHO	European Commission
IDP	Internally Displaced People
KAP	Knowledge, Attitude and Practice
NGO	Non-Governmental Organization
NRC	Norwegian Refugee Council
UNHCR	United Nation Higher Comision for Refugees
UNICEF	United Nations International Children's Emergency Fund
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

ABSTRACT

Ethiopia currently hosts the second-largest refugee population from African country, next to Uganda, sheltering 720,914 who were forced to flee their homes as a result of political instability, military conscription, conflict, famine and other problems in their countries of origin. Approximately 3,000 cases of Acute Watery Diarrhea (AWD) were reported in 2018 nationwide, widely held in Tigray region, followed by Afar due to inadequate access to safe water and sanitation combined with poor hygiene practices continue to increase disease outbreak risks, including AWD. Therefore, the aim of this study was to assess knowledge, attitudes and practices on hygiene and sanitation among refugees in Shire refugee camp. To achieve the objective, quantitative study using descriptive analysis was employed. The study has used questionnaires and Observation as tools to collect the primary data. A total of 372 head of randomly selected sample households were used in the study. The data was analyzed using STATA. Descriptive analysis using frequency, mean, median and percentage was used. This study showed that 6% do not know causes of diarrhea disease and important time to wash hands, and 5% of the respondents don't know the prevention method of diarrhea but the remaining percentage have a good knowledge on the cause and prevention of diarrhea disease and important times to wash hands. Besides, the highest percentage of refugees had good attitude with hygiene and sanitation, and regarding to practice more than half had inadequate practice towards hygiene and sanitation which is found by examining different HH activities in Shire refugee camp. As conclusion, hygiene education have a significant impact in increasing the knowledge, attitude and practice of the refugee towards sanitation & Hygiene.

Keywords:

WASH, Knowledge, Attitude and Practice and Diarrhea

CHAPTER ONE: INTRODUCTION

1.1. Background of the study

Ethiopia currently hosts the second-largest refugee population from African country, next to Uganda, sheltering 720,914 who were forced to flee their homes as a result of political instability, military conscription, conflict, famine and other problems in their countries of origin. The registered refugees and asylum seekers whom largely originating from South Sudan, Eritrea, Sudan and Somalia have crossed borders in search of peace or a better life. The majority of refugees in Ethiopia are located in Tigray Regional State and the four emerging regions of Ethiopia: Afar, Benishangul Gumuz, Gambela and Somali regions (United Nations, 2019). The four refugee camps in Shire, northern Ethiopia, host around 76,499 refugees (UNHCR, 2019).

The main objective of humanitarian WASH assistance is to save and preserve life and alleviate the suffering of populations facing severe environmental health risks and/or water insecurity in the context of anticipated, ongoing and recent humanitarian crises associated with WASH related problems in camps, and provide a better living conditions for refuges. But failure to manage WASH activities can negatively affect the refuges in health related problems such as diarrhea and trachoma not only refuges but also it can negatively affect the environment (ECHO, 2014). According to UNHCR (2018), some of major environmental risks from WASH programmes are related to pollution and degradation of the environment from poorly managed excreta, grey water, solid waste, and disease vector control related activities.

The refugee response in Ethiopia brings both the government and the Non-governmental institutions together in response to their needs. Different NGO's work in cluster and actively participate in humanitarian response to ensure that refugee have access to much-needed education, WASH, child protection, nutrition and health services. According to NRC (2017), Water, hygiene and sanitation (WASH) program improve access to safe and sufficient water and sanitation facilities, and promote hygiene awareness. Some of the major WASH related activities include; facilitating access to clean water and latrines, raising hygiene awareness, constructing and maintaining water infrastructures and providing water for agricultural production are some of the WASH activities to help improve hygiene and health status and reduces morbidity and mortality among refugee population. Lack of adequate WASH responses in terms of infrastructures and awareness can have consequences of becoming the potential causes of

waterborne disease and malnutrition, and health risks associated with poor water, and poor sanitation and hygiene services and practices (UNHCR, 2018).

According to the United Nations (2019), over 3,000 cases of Acute Watery Diarrhea (AWD) were reported in 2018 nationwide, widely held in Tigray region, followed by Afar due to inadequate access to safe water and sanitation combined with poor hygiene practices continue to increase disease outbreak risks, including AWD. In areas where the infrastructure is weak and where depleted water tables limit access to safe water the effect of poor sanitation practices on the health of Internally Displaced Peoples (IDPs) and refugees are mainly concerning issue.

Despite various studies (Nahimana, *et al*., 2017; Scobie, *et al*., 2016 & Ahmed, Khan, & Alam, 2001) that show the level of knowledge, practice and attitude of refugee communities on hygiene and sanitations, majority of the studies have not shown the association of the KAP levels with project interventions and their contribution towards improved health conditions, morbidity and mortality. However such studies are not prevalent in majority of the camps in Ethiopia, including those in Tigray. KAP surveys help to disclose misconceptions or misunderstandings that may represent obstacles to the WASH activities that we would like to implement and potential barriers to behavior change which can be used as an input for project success. The purpose this study is to assess the Knowledge, Attitude and Practices (KAP) of refuges on Water, Sanitation and Hygiene issues in selected refugee camp in Tigray Region at Shire Refugee Camp.

1.2. Statement of the problem

The problems associated with lack of adequate WASH services are enormous; each year, in worldwide 1.6 million of people die from diarrheal diseases and millions of people die from diseases attributable to lack of access to safe drinking water and basic sanitation. A place where over crowded people's lives in, lack of adequate potable water and poor hygiene and sanitation practices are the main causes of illness in a developing country like Ethiopia. Socio-economic and health burden contributes to lack of access to adequate safe water supply more likely in developing countries (UNICEF, 2017). The situation is being exacerbated as rapidly growing urban areas place pressure on local water resources. (ECHO, 2014) Diarrhea; is a leading cause of disease and death among children under five years in low- and middle-income countries, neglected tropical diseases such as soil-transmitted Helminth infections and Vector-borne diseases such as Culex mosquitos are disease that occur due to lack of safe sanitation system (WHO W. H., 2018).

Empirical evidences (Vujcic, Blum, & Ram, 2014) indicates that due to rarely practiced hand washing, at critical times, pathogens may be transmitted to or from hands in refugee camps. Lack of consistent supply of water, crowded living conditions, sometimes novel mix of ethnicities and cultures, and relatively poorly formed hand washing habits are some of the barriers in promotion hygiene and hand washing. Besides this, it also indicates that practices are generally poor either due to lack of knowledge regarding the benefits of hand washing with soap or because basic materials and designated hand washing locations are not available.

According to Sibiya and Gumbo (2013), research result indicates that knowledge on transmission routes was inadequate. The majority of people in refugee camps had no knowledge when it comes to water-based diseases and their prevention. This shows that the knowledge, attitude and practices still remain as major challenges facing our communities at large and refuges at specific to achieve the objectives of the project. Even though if the infrastructure is there, there is no assurance that people will use it accordingly all the times.

Even though the above studies tried to measure knowledge, attitude and practice of refugee on WASH projects however no enough studies have been conducted in refugee camps of Shire in particular and in Ethiopia in general. In addition, only limited studies have conducted the studies with respect to project success in achieving enough knowledge, attitude and practice there by bringing change in the lives of refugees. This study assesses the level of knowledge, attitude and practices towards WASH.

1.3. Research objectives

The general objective is to assess the Knowledge, Attitude and Practices (KAP) of refuges on Water, Sanitation and Hygiene issues in selected refugee camp in Tigray Region at Shire Refugee Camp.

1.3.1. Specific objectives

a) To assess the availability, reliability and current status of WASH services at shire refugee camp

b) To assess the knowledge, attitudes and practices of refuges towards water, sanitation and hygiene;

1.3.2. Research Questions

a) What is the current status, available and reliability of WASH service in shire refugee camp?

b) What are the levels of knowledge, Attitude and practice towards hygiene and sanitation in the refugee camps?

1.4. Significance of the study

The study can be of significant to help the Non-governmental organizations in Ethiopia in general and in shire refugee camp in particular as there are no much studies conducted on knowledge attitude and practice and the impact it may have on the success of the projects in the NGO sector. The study explores the input of WASH project in changing the knowledge attitude and practices by gathering data from different projects beneficiaries. The research also suggests ways to improve the knowledge, attitude and practice of the project beneficiaries. In addition to these, the research serves as an eye opener for other NGOs in Ethiopia who are implementing similar projects by showing the level of KAP, assess the availability and reliability of water supply that is used by refuges in order to achieve the overall objectives of WASH. This is of significant importance in filling a gap by showing factors to determine the success in achieving enough knowledge, attitude and practice there by bringing change in the lives of refugees.

1.5. Scope of the study

Different NGO's work in cluster and actively participate in humanitarian response to ensure that refugee have access to much-needed education, WASH, child protection, nutrition and health services. However, the study mainly focused on Water, sanitation and hygiene (WASH) among other services. The purpose of this WASH service is to improve sanitation and hygiene to address stunting, diarrhea and trachoma, leveraging resources for access to water and sanitation in camps and health facilities, innovating to improve functioning of water supply. In addition to this the research assessed the change in the knowledge attitude and practice of the refugee. On the other hand, this research would like to address the obstacles to change in knowledge attitude and practice of the beneficiaries and identify factors affecting to the change KAP in the refugee camp. The study was conducted in Tigray region; shire a district on four refugee camps namely; Mai-Aini, Adi-Garush, Hitsats and Shimbela. Thus, the study specifically be focused on the impact of WASH project on changing KAP of the refugee and its significance to lead a healthy life.

1.6 Limitation of the study

The major limitation of this study is that the survey was conducted in 4 sites in Tigray and may not be able to represent all refugee camps in Ethiopia. In addition to this there is a lack of studies and related literatures about importance of WASH project in contributing to Knowledge, Attitude and Practice of the beneficiaries.

1.7 Organization of the study

This study is organized in five major chapters. The first chapter deals with the introduction part of the study comprising statement of the problem, objectives of the study and other relevant issues. The second chapter focuses on reviews of literatures in related topics. A bird's-eye view on of relevant literatures in relation to the topic under discussion is made. The third chapter deals with the research design, data source and collection methods, methods of sampling and data analysis techniques used.

The fourth chapter presents the overall finding of the study which prevails about impact of WASH project on change in KAP; current status of sanitation and hand washing facilities, determine the availability and reliability of water supply in shire refugee camp is presented in this section.

The last chapter, chapter five encompasses the conclusion and recommendation part of the study. Conclusions are to be made from the previous chapter so that we can draw recommendations which are practically applicable to the refugee camp.

CHAPTER TWO: LITRATURE REVIEW

This chapter discusses the different literatures' which were conducted on the area of WASH project in changing Knowledge attitude and Practice of beneficiaries in relation to hygiene. Most of the literatures presented here under are conducted on different countries and situations to ascertain the challenges, situations as well as factors affecting KAP can vary from country to country. The purpose of this chapter is to refer and integrate with the finding of this this study.

2.1. Conceptual and operational definition

According to (ECHO, 2014) definition WASH stands for Water, Sanitation, Hygiene, and is one of the three main sectors of humanitarian operations along with food and health. WASH project works to improve sanitation, enhancing water availability, improving water quality and working with people on hygiene education (DFID, 2009). WASH program aims to improve access to safe and sufficient water and sanitation facilities, and promote hygiene awareness. In order to achieve the aim it involves activities such as: Facilitate access to clean water and latrines, Construct and maintain water infrastructure, Provide water for agricultural production, Reduce mortality and Raise hygiene awareness are some of the activities (NRC, 2017).

2.1.1. Meaning of KAP and the KAP approach in WASH

Knowledge: In this study, knowledge assesses the extent to which individuals from a household know hygiene concepts regarding WASH program. This was also included local knowledge and beliefs, knowledge of available hygiene materials, awareness of rights to access, and awareness of risk to water born disease.

Attitudes: The attitude attribute characterizes an individual's feelings, inclinations and indeed those of other household members with regards to WASH usage. These were characterized as negative (bad) or positive (good) in relation to the program goal.

Practices: The practice attribute documents the actions related to hygiene practice, and disposal of wastes. These were also characterized as proper or improper in relation to the scientifically documented risks of lack of hygiene practices and environmental contamination.

In general, Knowledge, Attitude and Practices (KAP) survey is a quantitative method that provides access to quantitative and qualitative information and reveals misconceptions or misunderstandings that may represent obstacles to the activities to be implemented and potential barriers to behavior change (Shrestha,

Manandhar, & Joshi., Study on Knowledge and Practices of Water, Sanitation and Hygiene among Secondary School Students, 2018). There is a linear association between knowledge, attitude, and behavioral change. Thus, in this study indicated that promote good attitudes and ultimately lead to the desirable positive change in behavior achieved through awareness campaigns (Muleme, Kankya, C.Ssempebwa, Mazeria, & Muwonge, 2017). Beneficiaries' knowledge and attitudes towards hygiene highly influence Hygiene practices even if there is the availability of proper resources and facilities. According to (Vivas, et al., 2010) explanations given for not washing hands included stubbornness (not wanting to follow what adults say), laziness, and the rush to go to breaks, the time it takes away from playing, and the dirt and smell of the toilets. Furthermore, stated that compared to operation and maintenance of centralized physical infrastructure use of hygiene education is more essential for the success of the project (DFID, 2009).

Figure 1: The impact of KAP on impact of refugees, Own diagram

Overall, KAP is the ultimate tool to measure impact of the intervention and by using KAP analysis we should be able to determine if our WASH activities added value towards hygiene (PIN, 2012). In other word, a KAP survey is a representative study of a particular population that targets to collect data on what is known, believed and done in relation to specific topic (Wang, et al., 2015)

2.2. Theoretical Framework .

2.2.1. Effect of Poor Sanitation and Access to WASH

About 10% of the global burden of disease accounts due to poor sanitation which are particularly linked with poverty and infancy. At any time close to half of the populations of Africa, Asia, and Latin America have a disease associated with poor sanitation, hygiene, and water .human excreta, faeces are the most dangerous to health. One gram of fresh faeces from an infected person can contain around 10^6 viral pathogens, 10^6–10^8bacterial pathogens, 10^4 protozoan cysts or oocysts, and 10–10^4 helminth eggs. The major face-oral disease transmission pathways are demonstrated in the "F Diagram", which illustrates the importance of particular interventions, notably the safe disposal of faeces, in preventing disease transmission (Mara, Lane, & Trouba, 2010)

Most infections occur through the **faecal-oral route** where pathogens enter a person's mouth through ingesting (eating or drinking) contaminated food or water, or when contaminated fingers are placed in the mouth. The different transmission routes are shown in Figure 2. The F diagram showing how diseases can pass from faeces to a new host. Sanitation (using a latrine), safe water supply and good hygiene are barriers to disease transmission., which is known as the '**F diagram**'. Pathogens contained in faeces enter a new host (a person's body) through the 'Fs' – fluids**,** fingers, flies or fields/floors. Effective sanitation, clean water and good hygiene behavior provide barriers to this transmission (WHO, 2020).

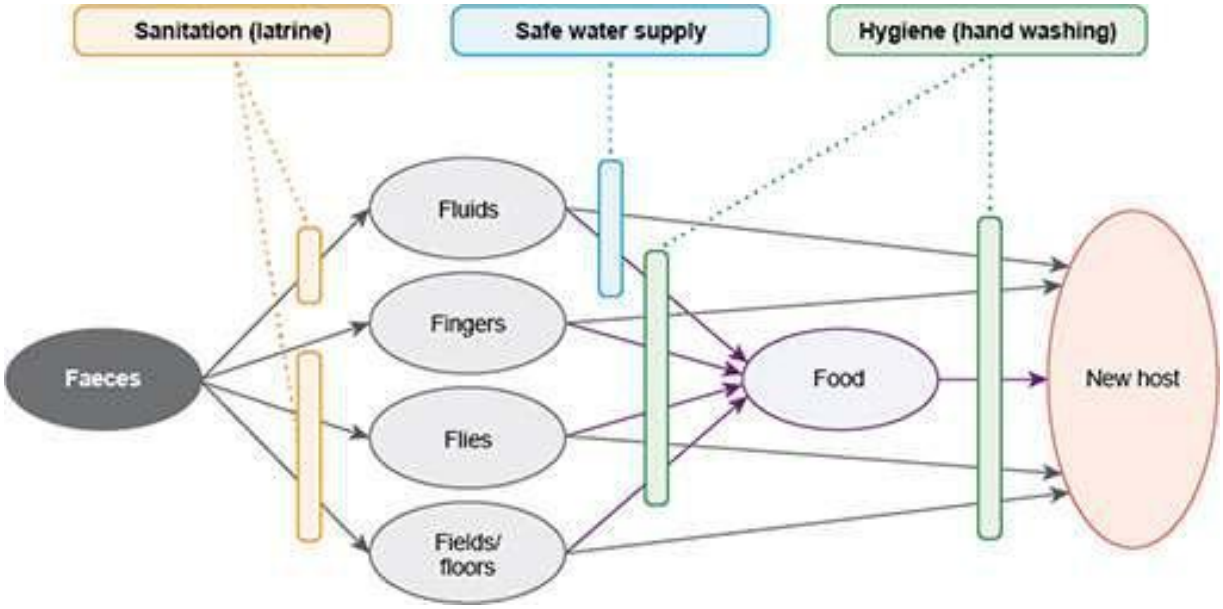

Figure 2. The F diagram showing how diseases can pass from faeces to a new host. Sanitation (using a latrine), safe water supply and good hygiene are barriers to disease transmission.

The faeces (on the left of the diagram) comes from an infected person. The new host (on the right of the diagram) could be any man, woman or child who is not currently infected with the disease. Infections can be transmitted from faeces to the new host as follows:

- Infection from *fluids* usually involves drinking or cooking with water contaminated with faecal organisms.
- In the *fingers* pathway, a person ingests the organisms (usually during eating) if they have come into contact with faeces and have not washed their hands properly afterwards. This contact can occur from defecation, from cleaning a child's bottom, from touching dirty surfaces or eating food prepared in an unhygienic manner.
- *Flies* and cockroaches often thrive on excreta. If they land on food they can transfer faecal matter that can be subsequently ingested by a person.
- *Field* (or soil) infection can occur by the ingestion of unwashed raw vegetables and fruit grown in soil contaminated with faeces. Contaminated soil may be transported by feet or shoes for long distances. Infections can also be transmitted through dirty *floors*, perhaps if food is dropped on the floor and then picked up and eaten

The following table shows the negative results occurs due to poor sanitation and wash access on the health of peoples

Bacteria	**Shigellosis**	**Causes abdominal pains and diarrhea (see below).**
	Typhoid	Mild to severe fever lasting from a few days to several weeks.
	Cholera	An infection of the intestines that can cause watery diarrhea leading to dehydration.
	Diarrheal diseases	Production of frequent watery faeces that can lead to dehydration.
	(note these can also be caused by viruses)	Can be fatal, particularly among young children.
		Diarrhea is a symptom of several other diseases in this table.
Viruses	Hepatitis A	An infection of the liver that can cause pain, diarrhea and jaundice.
	Polio	Can cause temporary or permanent muscle weakness, and sometimes death.
Protozoa	Amoebiasis (also known as	Infection that can occur up to several years after exposure to the protozoa.

	amoebic dysentery)	Can cause mild to severe diarrhoea and liver damage.
	Giardiasis	Infection of the small intestine. It is usually symptomless but can have a variety of intestinal symptoms, such as chronic diarrhoea, abdominal cramps, gas production
Parasitic worms	Ascariasis (roundworm)	One in four of the world's population has this infection, which can lead to weight loss,
		malnutrition and anaemia. It is very common in Ethiopia.
	Hookworm infection	Two species of nematodes that inhabit the small intestine, from where they suck blood,
		leading to anaemia.
	Tapeworm infection	A worm that normally lives in the intestines which can cause anaemia and malnutrition.
		This is usually spread through eating improperly cooked food that contains the worm or
		its eggs.
	Bilharzia or schistosomiasis	A disease caused by the Schistosoma worm that can cause diarrhoea and blood in
		the urine and faeces. In the long term, it can lead to liver and kidney damage.

Table 1Health problems associated with poor sanitation and management of wastes (Mara, Lane, & Trouba, 2010).

2.2.2. Benefits of improving sanitation

According to (WHO, 2019) benefits of improved sanitation extend well beyond reducing the risk of diarrhea. These include:

- reducing the spread of intestinal worms, schistosomiasis and trachoma, which are neglected tropical diseases that cause suffering for millions;
- reducing the severity and impact of malnutrition;
- promoting dignity and boosting safety, particularly among women and girls;
- promoting school attendance: girls' school attendance is particularly boosted by the provision of separate sanitary facilities; and
- potential recovery of water, renewable energy and nutrients from faecal waste

2.2.3. WASH Service Delivery

According to (UNcief, worldvision, MoH, DFID, & OpenUniversity, 2016) WASH services includes Water supply utilities, solid waste management systems, and liquid waste collection and disposal systems

are services delivered under WASH. These systems are intended to ensure that the water, sanitation and personal hygiene needs of beneficiaries are met. There are three key service areas in the WASH sector:

Water supply: includes the source of water, treatment plant, reservoir and tanks, main trunk lines, distribution lines and individual connection lines for the delivery of potable water. (Potable water is water that is safe to drink.). When the source of water is known to be clean and safe, for instance if it is from protected springs and boreholes there is no need for treatment system.

Liquid waste: Water-flushed toilets need to be connected to a septic tank or to a sewer network. A sewer network includes a system of underground lines (pipes) for collecting and removing liquid wastes from residential, commercial and industrial sources. The sewerage system is used for two major liquid waste categories: Black water and grey water. Grey water is liquid waste from showers, wash basins, dish washing in kitchens and clothes washing. Black water is the water flushed from toilets and contains faeces and urine.

Solid waste management services: Solid waste management systems include collection, transport and final disposal systems. Waste management may also include separating waste into its different components (glass, metal, plastic, paper, etc.) so that some of the waste can be reused or recycled. Infrastructure and equipment for solid waste management is usually paid for by the government and is therefore a public service.

2.2.4. Standards, Principles and Goal of WASH Projects

The goal of humanitarian assistance program is to protect and improve the lives of the people in crisis by providing all basic needs such as water, shelter and food. According to Water, Sanitation and Hygiene for Populations at Risk (2005), sanitary problems exacerbate due to conflicts, natural disasters, discrimination and marginalization of the state and communities which leads to humanitarian crises. WASH intervention program mainly give an attention on coverage of the most basic and immediate needs. Water supply and sanitation projects mobilize community through creating social cohesion and removing tension.

There are five UNHCR‟s protection and accountability principles that must be taken in to consideration in refuges for WASH programmes. In order to protect refugees and to create conditions where refugees can live in safety and with dignity these principles are desirable. Principle 1: Consultation, participation and accountability: Communities are consulted and participate in the assessment, planning, design, monitoring and maintenance phases of WASH interventions; information and feedback mechanisms are established to enable continued community input throughout the programme cycle. Principle 2: Equitable

access to WASH: Access to WASH infrastructure and services is equitable and considers requirements for persons with specific needs and vulnerabilities. Principle 3: Protection, safety and privacy: Factors to enhance protection from violence, safety from accidents and privacy considerations are integrated into WASH programmes, designs and services. Principle 4: Menstrual Hygiene Management: The needs of women and girls to manage their menstrual periods confidently, in privacy and with dignity are integrated into WASH responses. Principle 5: Cross-sector collaboration: The WASH sector collaborates with other relevant sectors to strengthen protection aspects of the WASH programme (UNHCR U. N., 2018).

World Vision, IRC, CARE, and ICRC are some of WASH project implementing NGOs. Among those UNHCR is a leading organization in the area of implementing WASH for refugees. UNHCR's mandate contains assuring refuges human and protection rights, access to survival needs, physical protection and also their health, well-being and dignity. This includes providing legal security to fully enjoy human rights, physical safety against natural or man-made threats and providing material assistance to satisfy basic necessities of life. Accordingly, access to water is a basic human right which is stated as essential in protection mandate of UNHCR. (Cronin, et al., 2008).

In order to implement Wash and sanitation it has its own minimum Standards and indicators. According to (UNHCR, 2020) the minimum standards and indicators are stated in the below table

Indicator		**Emergency Target** [1]	**Post Emergency Target**	**Means of Verification**
Water Quantity	Average # liters of potable[2] water available per person per day	≥ 15	≥ 20	Monthly Report Card
	Average # l/p/d of potable water collected at household level	≥ 15	≥ 20	Annual KAP
	% Households with at least 10 liters/person potable water storage capacity	≥ 70%	≥ 80%	Annual KAP
Water Access	Maximum distance [m] from household to potable water collection point	≤ 500m	≤ 200m	Mapping
	Number of persons per usable handpump / well / spring[3]	≤ 500	≤ 250	Monthly Report Card
	Number of persons per usable water tap[4]	≤ 250	≤ 100	Monthly Report Card
Water Quality	% Households collecting drinking water from protected/treated sources	≥ 70%	≥ 95%	Annual KAP
	% water quality tests at non chlorinated water collection locations with 0 CFU/100ml	≥ 95%	≥ 95%	Monthly Report Card

	% of water quality tests at chlorinated collection locations with FRC in the range 0.2-2mg/L and turbidity <5NTU[5]	≥ 95%	≥ 95%	Monthly Report Card
Sanitation	Number of persons per toilet/latrine	≤ 50	≤ 20[6]	Monthly Report Card
	% Households with household toilet/latrine[7]	-	≥ 85%	Annual KAP / MRC
	% Households reporting defecating in a toilet	≥ 60%	≥ 85%	Annual KAP
Hygiene	Number of persons per bath shelter/shower	≤ 50	≤ 20[6]	Monthly Report Card
	Number of persons per hygiene promoter	≤ 500	≤ 1000[8]	Monthly Report Card
	% Households with access to soap[9 & 10]	≥ 70%	≥ 90%	Annual KAP
	% of recipient women of reproductive age who are satisfied with menstrual hygiene management materials and facilities	≥ 70%	≥ 90%	Annual KAP
Solid Waste	% Households with access to solid waste disposal facility	≥ 70%	≥ 90%	Annual KAP
UNHCR WASH Standards for Communal Buildings				
Schools	Average 3 liters of potable water available per pupil per day 400 of pupils per usable handpump/well 200 pupils per usable water tap 50 pupils per toilet/latrine (30 girls per toilet, 60 boys per toilet – add urinals for boys)			
Health Clinics / Nutrition Feeding Centre	Average 10 liters of potable water available per outpatient per day Average 50 liters of potable water available per inpatient/bed per day 1 separated water point per health facility 20 outpatients per toilet/latrine 10 inpatients/beds per toilet/latrine			

[1] An emergency is arbitrarily defined as the first six months after the population movement has stabilized. However, this definition is context specific and should only serve as general guidance
[2] Potable water = safe for drinking
[3] For decentralized systems
[4] For centralized systems
[5] Minimum target at water collection point should be 0.5mg/L FRC in general, and 1mg/L FRC during an outbreak
[6] Post-emergency standard is 20 persons per toilet/shower, **aiming** for 1 toilet/shower per household or ≈5 persons
[7] Latrines/toilets should be facilities that are cleanable, guarantee privacy and are structurally safe
[8] In protracted situations, Hygiene Promoters should be combined with community health workers as much as possible
[9] To maintain health, dignity and well-being, at least 450 grams of soap should be distributed per person per month. 250g is for personal hygiene; 200g is for laundry and other washing purposes.
[10] To support safe Menstrual Hygiene Management MHM, UNHCR has made a commitment to providing 250g/month of soap in addition to the general soap distribution.

Table 2 Minimum standard and indicator of WASH

2.2.5. Hygiene Promotion and its components

Poor hygiene practices and inadequate sanitary conditions play major roles in the increased burden of communicable diseases within developing countries. According to (UNHCR, UNHCR Hygiene Promotion Guidelines, 2017) Hygiene Promotion can be defined as 'the planned, systematic approach to enable people to take action to ensure that water, sanitation and hygiene facilities and services have an

impact on health'. It can be seen as a subset of Health Promotion. It can also provide a practical way to facilitate participation, accountability and monitoring because it emphasizes the importance of listening to affected communities and the use of dialogue and discussion rather than simply relying on the development of materials and the dissemination of one-way messages. The components of hygiene promotion are described below:

Figure 3: key components of hygiene promotion.

According to (ST JOHN & TIM, 2018) One of WASH aspect is to promote hygiene the purpose of this awareness is to mitigate diseases related to water, sanitation and hygiene. Providing communities and households with knowledge and information, mobilizing people to take preventive action and providing essential materials and facilities are commonly used method to keep community hygiene

2.3. Empirical review

One study in South Africa sought to assess knowledge, attitude and practices (KAP) of learners on issues related to water, sanitation and hygiene in selected area. A quantitative survey questionnaire was then developed aimed at collecting information from respondents on their attitude and opinions on water, sanitation and hygiene. The data was analyzed using the Statistical Package for Social Science. The study revealed that level of knowledge about waterborne diseases was relatively high, but knowledge on

transmission routes was inadequate. The majority of the respondents had no knowledge when it comes to water-based diseases and their prevention. The attitude and practice on hygiene was also found to be high. Also indicated that there is an inadequate water supply and sanitation facility in the area where the study was conducted, with no hand washing areas and no sanitary bins for girls. (Sibiya & Gumbo, 2013). Similarly, the study conducted on Knowledge and Practices of Water, Sanitation and Hygiene by using cross-sectional study involved of 220 respondents. Data consisted of hygiene and hand washing practices, knowledge about sanitation and personal hygiene characteristics. The result showed us knowledge regarding water borne disease was high however, knowledge regarding transmission route seemed inadequate. The overall results showed that the knowledge and practice of Water, Sanitation and Hygiene (WASH) is still poor. (Shrestha, Vaidya, Manandhar, & Joshi, 2018)

Another study conducted in Burundian refugee camp 671 respondents were participated in data collection. A cross-sectional survey was conducted in Mahama Refugee Camp of Kirehe District, Rwanda. Data were obtained through administration of a structured KAP questionnaire. Descriptive, bivariate and multivariate analysis was performed using STATA software. The results in general indicates that there is a need for strengthening health education and hygiene promotion activities in Mahama and other refugee camp setting in order to increase healthy living condition by avoiding water born disease. (Nahimana, et al., Knowledge, atitude and practice of hygiene and sanitation in a Burundian refugee camp: Implications for control of Salmonella typhi outbreak., 2017).

A study was conducted in Ngala, Dikwa and Banki to determine the knowledge, attitudes, and practices. A cross sectional study was done where 287 respondent's caregivers with children 0-23 months were surveyed using quantitative methods. Participants of the focus group discussions were pregnant and lactating women and mothers and grandmother with children less than 24 months. Data was collected using the open data kit and was analyzed using SPSS 21.0. The result showed based on the scoring of Knowledge at critical times to wash hands, acceptable hand washing practices, and scoring on knowledge about the causes of diarrhea. Based on the scoring 67.2% of respondents had good knowledge of critical times to wash their hands, 20.6% fair knowledge while 12.2% had poor knowledge of critical times to wash their hands. Additional examination revealed that 71.1% had acceptable hand washing practices, 18.8% had fair practices while 10.1% had poor hand washing practices. 31% had excellent knowledge on the causes of diarrhea, 34.1% good knowledge and 34.8% had poor knowledge. (International, 2018) This shows that there is a need to create awareness for IDPs in camps on hand washing, the consequence of drinking water from unsafe water sources and root causes of many diarrheal and water-borne diseases.

A KAP survey conducted in Somali region in camps. Data was collected through 175 sanitation assessment surveys, 175 water quality tests, 1,237 household KAP surveys, 12 focus group discussions and 15 key informant interviews to provide baseline data against current water quality, quantity, and hygiene behavior, and to investigate linkage between water quality and risky hygiene practices. Stratified random sampling technique was used to conduct household survey while snow-balling technique was applied in the key informant interview. The study reviled that there is limited number of sanitation facilities is main issue at IDP settlements in Burao and Garowe; and the existing latrines in Mogadishu are in poor hygienic condition. Moreover, lack of knowledge about critical times to wash hands cause diarrheal infections (IOM, 2013).

The study conducted by (DRC, 2012), the study used a cross sectional, qualitative study was conducted through house to house interviews, taking 125 respondents randomly as study subjects. The sample represents nearly 8% of the total targeted populations. The questionnaire was employed to collect data on general background information, knowledge, attitude and practices of the IDPs of Lolkuach village. The data from the questionnaires were entered SPSS software (version 13) by the principal investigators for further analysis. The result indicated that there lack of knowledge on good hygiene and care practices, on disease transmission and how to protect themselves and their families from infection/transmission. Both a lack of access to hygiene items, and a poor attitude brought on by a lack of knowledge leads to poor hygiene practices. The participants are not able to practice hygiene because they don't have either the knowledge or the materials to implement. This shows that hygiene promotion is essential to change the attitudes towards hygiene, although change in behavior requires the distribution of materials.

A study conducted in Myanmar the survey was conducted in both urban and rural areas of the town. 6,000 households participated in this study. In this study both quantitative and qualitative methods were used. In the quantitative method, a household questionnaire, a checklist and 2 individual interview questionnaires was used. In the qualitative method, two focus group discussions were held with the community members and mothers and care takers in each village. The survey showed that the community members are quite aware of how a water source can be contaminated.54% of adults said that they understand personal hygiene as 'bathing' and 'to wash the face' (21%). But while most people took bath more than once a day (55%), and 89% of adults said they washed their hands after defecating, only 69% said they wash their hands with water and soap, i.e. four out of ten people do not wash their hands with soap after defecating. This shows 80% of people expressing a good understanding of ways water can be

contaminated and the reason for using a toilet which lead to conclude that Knowledge of correct hygiene practices is very high in Myanmar. On the other hand, the survey also shows that knowledge is not translated into practice, and it requires a major attitudinal change (uncief, Kowledge, Attitude and Practice Study into Water, Sanitation and Hygiene in 24 Townships of Myanmar, 2011) The research indicates that there should be a formative research to understand the determinants, barriers and facilitators of behaviors and the roles of various household and community members in promoting them.

A study conducted in Pakistan indicated that hygiene promotion campaigns through media have brought a significant change in perceptions of local communities in washing hands with a soap at critical times, domestic cleanliness, water treatment and safe disposal of solid waste. This study used stratified random sampling for quantitative data collection and quota sampling for qualitative data collection. Additionally, structured survey was used in the targeted village. In total of 1400 households were participated in the study. As a result, the knowledge of the target beneficiaries has increased regarding water borne diseases, water purifications and covering water containers. Additional the study revealed that 67% of households indicated the application of treated water, 95% of the respondents wash hands using soaps after the use of latrines and 80% & 87% of the respondents wash hands with soap before eating and cooking respectively (Laghari, 2014) .

A study conducted in Nyabiheke refugee camp. The Study design was cross-sectional and both quantitative and qualitative approaches were used. Target population was approximately 4000 heads of households in Nyabiheke refugee camp. The study tools were questionnaires, Interview guide and focus group discussion. Sample size was 384 head of households and simple random sampling techniques was used to select participants for quantitative approach and 5 keys informant interviewees were purposively selected for qualitative approach and analysis had transcripts from the 25 FGDs and KIIs. Pretest structured questionnaire was to collect quantitative data. Quantitative data was analyzed using SPSS version 21. Descriptive analysis using frequency and proportions was used. Chi-square test was used to establish factors associated with dependent variable (practice on hygiene and sanitation) .The result revealed that the highest percentage 48.2% of participants had low level of knowledge regarding hygiene and sanitation, 23.7% had moderated knowledge while only 28.1% had high knowledge level on hygiene and sanitation. Moreover, the highest percentage of refugees 47.4% had good attitude with hygiene and sanitation, (36.7%) had moderated attitude while lowest percentage, (15.9%) had low attitude level and

more than half (60.9%) had adequate practice while 39.1% presented inadequate practice regarding hygiene and sanitation in Nyabiheke refugee camp (Consolatrice, 2018).

A study conducted on Knowledge, Attitude and Practice (KAP) of Hand washing in Oromia region with a methodology of community based cross-sectional study which employs interviewer- administered Amharic language structured questionnaire was conducted. A systematic sampling technique was applied to get the sampled 264 mothers of under five children. Data was collected by pre- tested questionnaire. Data Analysis was done manually by using Microsoft excel 2010 spreadsheets and Epi Info Version 7 after checking for completeness and coding. Odds ratio was done to determine the association between independent variables and outcome variable at 95% confidence interval. The result showed that the women had moderate knowledge of hand washing practice during critical time. However, hand washing attitude and practice during critical time especially during child feed is low. Hand washing during critical promotion program by health care workers, particularly focused on behavioral factors should be implemented. The health extension workers should enable each house hold to have hand washing facility with soap at the convenient place (Demssie, et al., 2015).

2.4. Knowledge gap

According to the study which assessed the knowledge, attitude and practices (KAP) of learners on issues related to water, sanitation and hygiene in selected schools in Vhembe District, South Africa. The attitude and practice on hygiene was also found to be high (91.40 ±1.16%). Additionally, Study on Knowledge and Practices of Water, Sanitation and Hygiene among Secondary School Students This study revealed that knowledge regarding water borne disease was high among urban school students 86.5% but knowledge regarding transmission route seemed inadequate in both urban and rural students (35% and 16% respectively). The practice on hand washing was found high (94.4%). Treated water facility and hand washing facilities with water was found lacking in rural schools. Schools from the urban area had proper hand washing facilities, but there was not any soap available in both the areas. (Shrestha, Manandhar, & Joshi., Study on Knowledge and Practices of Water, Sanitation and Hygiene among Secondary School Students, 2018)

A result from KAP assessment on Water, Sanitation and Hygiene in Lolkuach Village revealed that Water quality is an issue as households are obtaining this from the river which is also used for cleaning, human defecation and by livestock. Access to appropriate quantity of water may be affected by lack of water

transport/storage containers. People, mostly girls and women, are travelling at least 50 minutes to access water, which can cause protection issues And also the results also showed as households have poor hygiene and care practices due to lack of access to hygiene materials, lack of access to clean water, lack of access to proper sanitation facilities, Poor attitude towards hygiene (seen as unimportant) and limited knowledge on good care practices, hygiene practices and disease transmission (DRC, 2012).

Regarding different literatures related to this topic, it has been revealed that knowledge, attitude and practices on hygiene and sanitation among refugees have few gaps. Hand washing and hygiene interventions address several transmission routes but only few studies attempted to evaluate them and mainly focused on improving knowledge and uptake of messages but not necessarily translating this into practices. However, there is no study done yet at Shire refugee camp to show KAP of refugees on hygiene and sanitation. Therefore this research fills the existing gap by examine the contributions of WASH project for a change in KAP and determine the success in achieving enough knowledge, attitude and practice there by bringing change in the lives of refugees. This shows a requirement to a lot of effort needed to be in place in order to improve community health and wellbeing.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design

The research is a quantitative study using descriptive analysis interested to create an understanding of the level of WASH coverage, underlying reasons for existing level of knowledge, practice and attitude, opinions, and motivations and answering key questions rose as part of the statement of problem to help answer the key questions encountered by refugees and as a challenge posed by projects dealing with water and sanitation problems in refugee settlements. This study was designed as questionnaire based, cross sectional analysis. The research makes analysis and conclusions based on the descriptive outputs. This technique helped to best explain the variables that play a key role to WASH project success in refugee settings. The data was collected through in-depth interview from the four refugee camps in Tigray using a questionnaire designed to capture key WASH components reflecting knowledge, attitude and practice. This research also started with a comprehensive study of literatures around the topic. After reviews of various literatures and academic works, a questionnaire was developed after exploring the research gaps in the area. Representative number of refugees from living the four camps were asked questions as part of a survey to find answers to the research questions.

3.2 Target Population & Method of Sampling

The study targeted refugees living in refugee camps in Tigray. List of registered households was used as a basis of mapping out the samples. A systematic sampling technique was used through two stage cluster sampling to draw samples from the list of registered households. The refugee camps were considered as clusters. According to recent data from UNHCR, in the four refugee camps in Tigray (Shimelba, Histast, Adharush, Mayinni), there are a total of 10,313 registered refugee households.

The total beneficiaries supported through the WASH interventions which are the entire camp population was used as a target population to calculate the sample size required for this particular assessment. The following formula is used to calculate the sample size for each of the camps under consideration.

$$\text{Sample size} = \frac{\frac{z^2 \times p\,(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p\,(1-p)}{e^2 N}\right)}$$

N = population size • e = Margin of error (percentage in decimal form) • z = z-score

Calculating for the sample size with the use of a 95% confidence level and confidence interval of five (5) provides a sample size of 372 out of the total camp population (10,313 households) which is then proportionately divided among the four refugee camps. The enumerators participating in the survey were trained on the purpose of the survey, explaining the appropriate approach, ethics and methodology (e.g. respondents' right to refuse and what is consent, how to select households and respondents), as well as translation into local language.

Table 3: Sample size selected by refugee camps

Refugee Camps	Number of households	Sample Size
Adi-Harush camp	2,029	73
Hitsats camp	3147	114
May-Ayni camp	3,235	116
Shimelba camp	1,902	69
Total	**10,313**	**372**

Source: 2019 UNHCR refugee population data

3.3. Data Source & Collection Methods

Data used in the study came from primary sources of information which was basically used to analyze the variables in the study. Of course; data from secondary sources and other supportive documents from an extensive literature review of academic journals, articles, thesis and information were used to support the study. The data from primary sources was collected with the use of in depth interviews with refugee households in Tigray and key informant interview with humanitarian actors. The tools were developed to capture information on areas of enquires emphasized by the research questions. The questionnaire was

categorized in key areas of water, sanitation and hygiene and was able to capture knowledge, attitude and practice of the community.

3.4. Method of data Analysis and Presenting the Outcome:

The research used quantitative study with the application of descriptive statistics such as percentage, mean, mode, median, frequencies and standard deviations to analyze the data collected from primary sources. After data collection from the camps, the responses were checked for clarity, legibility, relevance and appropriateness. Data encoding was done through the use of STATA which was then be analyzed using descriptive statistics.

3.3 Reliability and Validity

To ensure the reliability of the study a standard questionnaire is used to collect data across the camps for all the respondents. The respondents were asked in a language they understand by hiring data collectors who are able to speak the language of the refugee population. Data collectors were followed up across the course of data collection. The different aspects of validity were insured using expert review and audit trial during the different stages of the study.

3.4 Ethical Considerations

It is imperative that ethical considerations are considered during conducting any study. This study has taken in to consideration various ethical elements to make sure it follows the code of ethics for conducting the study and ensure morale values are not compromised.

All participants of the study were informed about the nature of the study; all of the aspects of the research that are likely to affect their willingness to participate were disclosed. This includes the amount of time it takes to complete the information and objective of the study. By doing so the full consent of the participants was required and only those willing to provide information were interviewed based on questionnaire. Moreover participants had the rights to withdraw from the study at any stage if they wanted to do so.

Utmost caution was taken to protect the privacy of participants in this study. Anonymity of individuals and companies participating in the study was implemented to help ensure privacy.

During the formulation of the questionnaires, the researcher made sure no offensive, discriminatory, or other unacceptable language is used.

Upon use of the works of other authors used in any part of the study, the authors were acknowledged and cited as source for the part used in the study. In addition to this, the study maintained highest level of objectivity in discussion and analysis throughout the study report. To ensure the validity and reliability of the study, data was collected using a standard questionnaire throughout the data collection process.

CHAPTER FOUR:

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

In this study, knowledge, attitudes and practice towards hygiene and sanitation practices were evaluated. Data collection and analysis took place between March and May 2020. For this study the sample size was 372 respondents. Microsoft excel was used for data entry and then after data were exported to STATA software. Findings were analyzed using descriptive statistics like frequency, descriptive statistics, percentage, mean, mode, median and standard deviations. Simple random sampling technique was used to select respondents for the study. The study results presented here explore the thoughts and opinions of community Members in Shire refugee camp as follows

4.2 Socio-demographic characteristics of respondents

The demographic data contains sex, country of orgin, Household size, Number of Children under the age of 5 and person with disablitlities &/ or eldres in the household of the respondants. This data is summerized and explained using tables and charts.

The respondants were from 4 refugee camps. The higest percentage of the respondant were from Adiharuh camps and Mayinni which is 26% followed by 25% from Histast and 23% from Shimelaba refugee camps.

Figure 4: Number of respondents by refugee camps

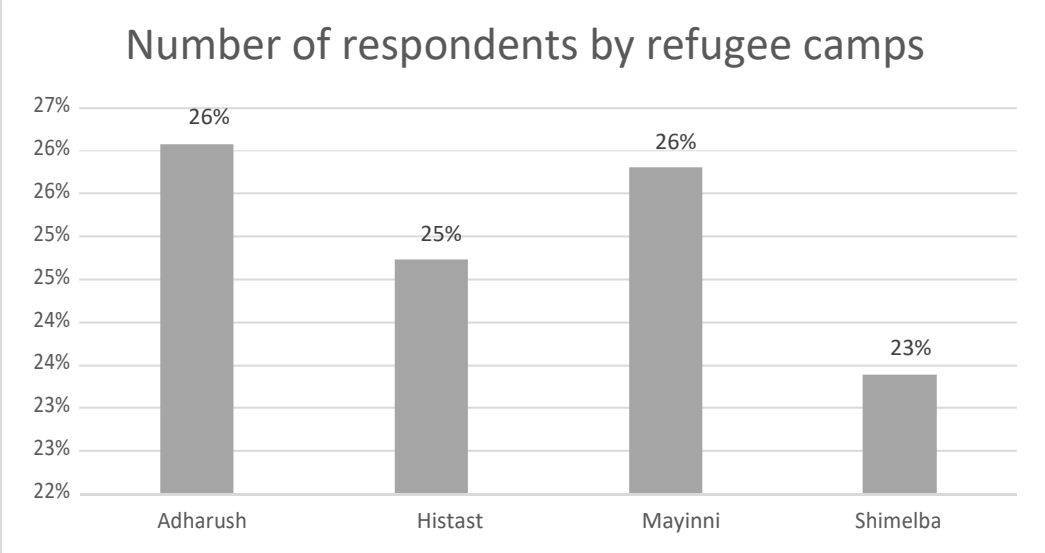

Table 4: sex of the respondents and person with disabilities

Variables	*Categories*	*Freq.*	*Percent*
Sex	Female	257	69.09
	Male	115	30.91
Persons with disabilities &/or Elders in the HH	No	332	89.25
	Yes	40	10.75

The study findings demonstrated that the country orgin of the respondants were all from Eriteria.More than half of the respondants for this study 257 (69.09%) were female therefore male were 115 (30.91%). Regarding Persons with disabilities or elders in the house hold of the respondents out of 372 participants 332 have no persons with disabilities/ Elders in their house but the remaining 40 indicate in their response that there is person/ elders with in the household.

Table 5: Household size

	Mean	*Median*	*SD*	*Variance*	*N*	*Range*	*Max*	*Min*
House hold Size	5.432796	5	2.586154	6.688194	372	14	15	1
Number of children < 5 years	0.7634409	0	0.92171	0.8495493	372	5	5	

As described in the above table the average household size for the famlies is 5 rangeing from a maximum of 15 people living together to 1 person in the house. The standard deviation from the mean for distribution of the hosueholds size is 2.5. Regarding the number of children under the age of 5 years the maximum was 5 and there is an average of one child per household.

4.3. Availability and reliability of Water Supply and Hygiene services

Water supply is the key to sustaining life and a means of keeping personal and environmental hygiene and sanitation.

Table 6: Distance from closest water point

variable	mean	Median	Sd	variance	N	range	min	max
Distance to closest water point in meters	371.1918	250	815.1684	664499.5	372	8333.333	0	8333.333
water storage per person per day	17.56039	11.42857	22.2903	496.8573	372	160	0	160

Total Volume Collected Potable Protected	106.4995	60	242.4602	58786.95	372	2500	0	2500
Distance to closest point to get water	4.454301	3	9.782021	95.68793	372	100	0	100

As described in Table 6, the average meters traveled by the households to access water from the closest water point is 371 meters which is much higher than the 200 meters the UNHCR standard. The distance traveled to access water is highly variant among the household living in the camps. The high standard deviation proves water is not equitably distributed among the camp population. The distance travelled to get water varies from o meters (those accessing in their premises) to travels up to 8 kilo meters to get to the water point.

The water storage per day for the families have also been found to be below the UNHCR recommended standard of 20 liters per person per day signaling a shortage of water for people living in the refugee camps. Public tap and hand pumps provide source of water for the majority people living in the refugee camps.

The households collected an average of 106 liters of protected water from different sources. Even though there is variation between the households, the amount of clean water collected by the households is only slightly less than the required. An average of 106 litters (60%) were collected for household purpose with a deviation from mean of 242 indicating huge variation between the households.

An analysis of the average water storage was also done showing the average water storage capacity of the households 74 liters. This have the implication that the households don't have enough storage facilities in the households. The average water collected being 106, the average capacity (74 liters) is very low implying that households have to refill the storages at least once in a day and have to wait until water in the other containers are finished.

As to the total hours travel by the households to collect water, the respondents had to travel an average of 4 hours to the closest water point to collect water. Worse than the length of hours traveled to collect water, due to low water storage capacity as a result of not having enough containers, they have to travel back to

refill the containers. This have an adverse effect of encouraging households to use unsafe water for their household needs aggravating disease transmission.

Table 7: source of drinking water for HH

Variables	*Categories*	*Freq.*	*Percent*
Principal source of drinking water for the HH	Hand pumps/boreholes	10	2.69
	Protected spring	1	0.27
	Public tap/standpipe	353	94.89
	Rain water collection	1	0.27
	Surface water (lake, pond, dam, river)	2	0.54
	Tanker truck	3	0.81
	Water seller/kiosks	2	0.54
Source of water used for other activities	Bottled water, water sachets	1	0.27
	Don’t know	2	0.54
	Hand pumps/boreholes	4	1.08
	Other	13	3.49
	Protected spring	4	1.08
	Protected spring Public tap/standpipe	1	0.27
	Public tap/standpipe	105	28.23
	Public tap/standpipe Bottled water	3	0.81
	Public tap/standpipe Hand pumps/borehole	7	1.88
	Public tap/standpipe Hand pumps/borehole	6	1.61
	Public tap/standpipe Surface water	7	1.88
	Public tap/standpipe Tanker truck	3	0.81
	Public tap/standpipe Unprotected hand pumps	4	1.08
	Public tap/standpipe Water seller	14	3.76
	Rain water collection	6	1.61

The main source of drinking water for the HH; based on the summary of the analysis, the majority 353 (94.89%) of the households use public tap/standpipe, while the remaining 10 (2.69%) use hand pumps/boreholes and 3 (0.81%) use tanker truck to fulfill their drinking water needs. There were other 2(0.54%) and 1(0.27%) who were found to be using surface water and protected spring respectively. The result shows that the majority of the refugees have access to safe drinking water. Having access to safe water is important for the health of the refugees which can significantly help in decreasing diarrheal disease which is the second leading cause of morbidity and mortality among children under five in low- and middle-income countries.

Regarding using source of water for other activities, most of the refugees; 105(28.23%) use public tap/standpipe, 14 (3.76%) use water seller. The rest 6 (1.61%) and 7 (1.88%) use rain water collection and surface water respectively. Public taps have supported many families by serving the major source of water for the refugees. However the study findings show that still a significant proportion of people don't have access to public taps and forced to resort to rain water collection, water seller and surface water which could sometimes harmful.

Table 8: Water source availability

Variable	*Categories*	*Freq.*	*Percent*
Do you pay for water?	No	331	88.98
	Yes, per container/volume	15	4.03
	Yes, per container/volume	26	6.99
Collecting enough water for the house hold	No	142	38.17
	Yes	230	61.83
Do you have water source in your premise	No	292	78.49
	Yes	80	21.51
Reason for not able to collect enough water for the household	Can't afford to buy enough	1	0.7
	Don't have enough storage containers	9	6.34
	It is too dangerous to get water	1	0.7
	Limitation of volume of water that can be collected at water point	7	4.93

	Other	4	2.82
	There are water shortages	102	71.83
	Waiting time at the water point is too long	12	8.45
	Water is too far	6	4.23
		142	100

Table 8 presents the data the condition of Payment to get a water. Accordingly, the majority 331(88.98%) of respondents confirmed that they don't pay to get for water. The rest, 15 (4.03%) of respondents confirmed that they pay per container/volume and the remaining 26 (6.99%) of respondents confirmed that they pay per container/volume.

The above table showed as weather the households collect enough water for the members or not, 230 (61.83%) of the respondents said they collected enough water for the household activities but the remaining 142(38.17%) haven't got enough water for their households.

Regarding availability of water source on their premises, 78.5 %(291) of the respondents don't have a water source available on their premises while for the rest 21.5 %(80) water is available directly on their premises. This will greatly reduce pressure on public taps and help households to get more water for their daily needs.

As it implied by the respondents the reason for not getting enough water is due to water shortage as confirmed by 102 (71.83%) of the respondents, long waiting time at the water point confirmed by 12 (8.45%), lack of adequate storage confirmed by 9 (6.34%) and limitation of volume of water that can be collected at water point confirmed by 7(4.93%). Whereas the remaining 7 (4.93%), 6(4.23%) and 1 (0.7%) identified limitation of volume of water that can be collected at water point, distance, cost & security; respectively as the reason for not getting adequate water. This clearly shows that there is a need for additional water points which can have the ripple effect of reducing waiting time, distance and security. The other major point raised by the respondents is related to the storage capacity which calls for distribution of more water containers for the households.

For proper hygiene and sanitation, access to safe drinking water and frequent and proper hand hygiene play key roles in creating healthy family and communities. The study assessed the sources of water for drinking and other household activities.

Table 9: Participants cleaning drinking water practices

Variables	*Categories*	*Responses*	*Percent*
Do you use drink water directly from the river or canal	NO	321	86.29
	Yes	51	13.71
Anything done to make water ready for drinking	Yes, we always treat it before drinking	81	22.38
	Yes, SOMETIMES treat it before drinking	41	11.33
	No, do not treat it before drinking	238	65.75
	Don't know	2	0.55
How do you make water ready for drink	Boil it	14	11.48
	Boil it Expose it to sunlight	4	3.28
	Boil it Let it stand and settle	6	4.92
	Boil it Use disinfection products Expose it to sunlight	1	0.82
	Expose it to sunlight Boil it	1	0.82
	Filter it	2	1.64
	I don't know	3	2.46
	Let it stand and settle	51	41.8
	Let it stand and settle Boil it	21	17.21

	Let it stand and settle Boil it Expos	4	3.28
	Let it stand and settle Boil it Expose it to sunlight	1	0.82
	Let it stand and settle Expose it to sunlight	1	0.82
	Let it stand and settle Use disinfection product	1	0.82
	Other	6	4.92
	Use disinfection products	5	4.1
	Use disinfection products Expose it to sunlight	1	0.82
Participants cleaning drinking water container practices	At least once a month	57	15.32
	At least once a week	195	52.42
	At least once a year	1	0.27
	Don't know	1	0.27
	Every time we use them	116	31.18
	Never or less than once a year	2	0.54
Methods of cleaning drinking water container	Don't know any method	1	0.27
	Others	1	0.27
	Rinse them with water	57	15.41
	Wash them by using rocks/sand.	25	6.76

	Wash them with a piece of tissue/sponge	7	1.89
	Wash them with a specific product.	279	75.41

Error! Reference source not found. presents the data that is helpful to understand the source of water for drinking by the communities. An alarming number of the respondents (13%) responded that they drink water collected from the rivers. If the water is left untreated it can be damaging to the health of the communities. This showed that the respondents had a high chance of getting bacteria, viruses and parasites that may be in the river water which leads to health problems. In addition to unavailability of safe water options for part of the communities, lack of knowledge and practice on water borne diseases greatly contribute to the use of unsafe water sources. One other similar study that was conducted in South Africa, on knowledge, attitude and practices (KAP) of learners reveled that majority of the respondents had no knowledge when it comes to water-based diseases and their prevention (Sibiya & Gumbo, 2013) The situation in the Shire refugee camps is also similar to this due to the fact that households lack proper knowledge water borne diseases leaving them exposed to such diseases.

The participants were asked if they treat water before they serve it for drinking, 238(65%) of the respondents do not treat it before drinking, 81(22.38%) always treat water before drinking. Whereas 41(11.33%) of the participants sometimes treat it before drinking and 2 (0.55%) don't know if the water has to be treated or not. The majority of the respondents do not treat water before drinking which shows that most participants don't understand the importance of treating water and prevention of water borne diseases due to lack of awareness. The impact of drinking untreated water on the health of the refugees may cause variety of illnesses, including: diarrhea, stomach cramps, vomiting. Similar findings on a study conducted in Burundian refugee camp indicated that there is a need for strengthening health education and hygiene promotion activities in Mahama and other refugee camp settings in order to increase healthy living condition by avoiding water born disease. (Nahimana, et al., Knowledge, atitude and practice of hygiene and sanitation in a Burundian refugee camp: Implications for control of Salmonella typhi outbreak., 2017)

The participants of the study were also asked the different methods they use to make water ready for drinking. Most participants (42%) use traditional methods of letting it stand and settle, while 21 (17.21%)

let it stand, settle then boil it with another 11.5% responding they simply boil it. Other mentioned methods of making water ready to drink include use disinfection products, exposing it to the sunlight and boil. Even though not all the methods are equally effective they could help clean the water used by the families. It is also important to teach the communities on the most effective methods of cleaning water and support in distribution of water cleaning agents during distribution of non-food items to the families

The table presents data related to the frequency that participants clean drinking water containers. The majority; 195(52.42%) of respondents clean their water container once a week, 116(31.18%) of respondents clean their water container every time they use, 57(15.32%) of respondents clean their drinking water container at least once a month. On the other hand a very small number of participant 2(0.54%) never clean or clean it less than once a year. This shows even if the majority have a good practice of cleaning the container, some of the refugees lack the knowledge and practice in terms of cleaning drinking water containers. The effect of the containers not being cleaned or disinfected for a long time, the physical, chemical and the biological contaminants result in mudding, shedding, rusting, color, odor and bacteria formation in the water containers which infects the water inside. This situation can led to serious health problems increasing morbidity and mortality rates.

It also showed that cleaning method used by the refugees to clean drinking water containers; most of the refugees 279 (75.4%) said they wash them with a specific products, 57 (15.41%) responded they rinse them with water and 25 (6.76%) participants responded that they wash them using rocks/sand. The remaining 7 (1.89%) & 1(0.27%) wash the container with a piece of tissue and don't know how to wash at all respectively. Detergents are most effective in removing germs from the water containers, which means that the rest of the people who rinse the containers with water and simply using sand and stone are exposed infections from water borne disease. Hygiene and sanitation educations need to include the management and handling of water containers, including how to clean them for healthy use.

Table 10: Availability of specific hand washing device and Soap in the Households

Variables	*Categories*	*Freq.*	*Percent*
Where do the households get a soap?	Distributed by a NGO	201	55.37
	Gifted	17	4.68
	Purchased	117	32.23
	Traded	28	7.71

Substitutes for soap to wash hands	Ash	5	55.56
	Do not use anything	1	11.11
	Water only	3	33.33
Is there specific hand washing device in your house	No	255	68.55
	Yes	117	31.45
Is there a water in the hand washing device?	No	39	33.33
	Yes	78	66.67
Is there a soap/ashes in the hand washing device	No	44	37.61
	Yes	73	62.39

The above table showed where the refugees get a soap; accordingly 201 (55.37%) of the respondents get a soap through distributions made by NGO, 117(32.23%) said they purchased the soap while 28(7.71%) and 17 (4.68%) said they traded with other items and got the soap as gift. Participants who responded as not having soap were also asked the reasons; the explanation given by the participants for not having a soap were unavailability added with affordability 5(55.56%), while the other 11%said they can't total afford to buy soap. This may force some of the households to use non-hygienic items in the household, exposing them to contaminations.

In instances where the participants don't have access to soap, they found to have been using alternative methods which they think could be used as detergents. The above table showed what the participants use if there is no soap as a substitute; the majority of the respondents 5 (55.56%) used ash, another 3(33.33%) used water only and while 1(11.11%) does not use anything if there is no soap available.

The participants were asked if there is a specific hand washing device in the household; 255 (68.55%) have no specific hand washing device in their households, 117 (31.45%) have a specific hand washing device in their house. This showed that even if there is water availability, insufficient hand washing devices among the refugee community is contributing to low practice of hand washing even at critical times which will intern has an impact on the health of refugee population. Likewise, one study in South Africa sought to assess knowledge, attitude and practices (KAP) of learners on issues related to water, sanitation and hygiene in selected area and the result indicated that there is an inadequate water supply and sanitation facility in the area where the study was conducted, with no hand washing areas and no sanitary bins for girls affecting the hand washing practice of the girls. (Sibiya & Gumbo, 2013).

The above table also presents the availability of water in the hand washing device, majority of the respondents 78 (66.67%) have a water in the device while the remaining 39(33.33%) have no water in the hand washing device. This showed that availability of hand washing device by itself is not enough because some of the respondents have the device without water which can prevent washing hands during the critical times leading to people getting infected by germs and other diseases which may cause illness among the refugees.

In order to understand the availability of soap/ashes in the hand washing device the respondents were asked; the majority 73 (62.69%) respondents have a soap and 44 (37.61%) have no soap in the hand washing device. This showed that those who have no soap/ashes around the device are not able to wash their hands with disinfectant products which will lead them getting infected by germs which will contribute to ill health and fatalities.

Table 11: Availability of latrines in Households

Questions	*Variables*	*Freq.*	*Percent*
Is the latrines giving a service?	No	24	8.16
	Yes	270	91.84
Where do HH members usually go to defecate (excluding children under 5)	Bucket toilet	5	1.34
	Don't know	3	0.81
	Household latrine	208	55.91
	Open defecation	66	17.74
	Other	2	0.54
	Plastic bag	2	0.54
	Shared Latrine	86	23.12
Where do children under-5 living in this household usually go to defecate?	Household latrine	60	32.61
	Open defecation	34	18.48
	Other	1	0.54
	Plastic bag	12	6.52
	Plastic pot	55	29.89
	Shared Latrine	22	11.96
	Buried it	5	4.9

For the children under 5 that don't use the latrine, what is done with their feces?	Collected and disposed in latrine	70	68.63
	Collected and disposed of elsewhere	21	20.59
	Don't know	2	1.96
	Nothing is done with it	1	0.98
	Other	3	2.94
Do adult members of your household sometimes defecate in the open air (for example at night)?	No	256	83.66
	Yes	50	16.34
Why do you defect in open air?	Don't know/Not sure	5	10
	Latrine is too far	3	6
	Other	3	6
	no latrine available	15	30
	Too dark at night	19	38
	Too tired	5	10
Is there a Designated bathing facility in HH?	Do not have a designated bathing facility	189	50.81
	Have a designated shower/bathing facility	183	49.19
Is the courtyard clean	No	61	16.4
	Yes	311	83.6

The table presented if the latrines in the house hold are in use or not; 270 (91.84%) households responded they are using the latrines while the remaining 24(8.16%) of the respondents said the latrines did not give the service that is needed. This shows even if latrines are available without adequate knowledge people may not be motivated to use the latrines which can easily cause hygiene related health problems among the refugees. Similarly, a study conducted in Somali refugee camps revealed that limited number of sanitation facilities is main issue at IDP settlements in Burao and Garowe; and the existing latrines in Mogadishu are in poor hygienic condition which was the cause many problems related to hygiene and sanitation. (IOM, 2013)

The places where households defecate widely vary from household to household. Table 11 presents the data where the house holds defect and shows 99(33.67%) use shared facility used commonly by a number of house hold, 193 (65.65%) used single household facility (used only by this household) and 1(0.34%) said they used communal latrine and others. This result showed us majority of the respondents have access to latrine it could be a private or shared one which benefit the households by helping to keep their environment and living facilities clean and help to prevent germs which in turn contributes to improved health conditions by the refugee population..

The above table also present a data about kind of toilet facilities used by under 5 children in the House hold, the majority 60 (32.61%) used household latrine, followed by 55 (29.89%) of the participants using plastic pot and 34 (18.48%) using open defecation. The rest used plastic bag and shared latrine with a proportion of 6.52% & 11.96% respectively. This shows that the majority have a good knowledge and practice in using the latrines which helps refugee to keep their environment clean in order to avoid contamination and diseases which can be caused due to lack of environmental hygiene.

One of the hygienic practice needed for the community to prevent contamination is proper disposal of feces if children. Table 11 present a data about how feces are being disposed by the households; for children's under 5 who don't use latrine the feces disposed in a way which, 70(68.63%) collected and disposed in the latrine, 21 (20.59%) collected and disposed elsewhere and 5 (4.9%) buried in the ground. The result showed even though the majority disposed in proper way some of the participant disposed elsewhere which can increase the risk of contamination and getting infected by diarrhea.

The participants were asked if they defecate in open air or not; the majority 256(83.66%) said they don't defecate in the open air while the rest 50 (16.34%) do defecate outside. This showed that those who defecate outside have lack of practice and attitude as public latrines could have been used in the worst

scenario even if there are problems related to public toilets which is discussed below. Defecating in open air can cause environmental pollution which is a root cause for contamination and other transmitted diseases.

The reasons for defecating in the open air and the results of which are summarized as follow; A huge proportion(30%) among those who defecate in the open air are due to unavailability of latrine and another 10% said they have no idea why they want to defecate in the open air. The public latrine infrastructures are far from some of the households which created people to defecate in the open air. Some households also mentioned unavailability of light in the latrine infrastructures which makes it hard to use during the evening especially for women and children. From these finding we can understand that there are three major things which came in to play for open defecations; inadequate latrine, distance of the latrines and availability of light whose improvement can help reduce open defecation and help in healthy environment and people surrounding the areas.

The participants were asked if they have a designated bathing facility for which 189(50.81%) respondents don't have a designated bathing facility and 183 (49.19%) have a designated shower/bathing facility in their households. This shows that almost half of the participants have no bathing facility in the house hold which is below the UNHCR hygiene standard. The Post-emergency standard set by the organization is 20 persons per toilet/shower, aiming for 1 toilet/shower per household or 5 persons. Unavailability of bathing facility may lead the refugees to have lack of keeping personal hygiene practices which will be cause of different diseases.

In relation of cleanness of courtyard, for which the majority of respondents 311 (83.6%) said their courtyard is clean with a remaining 61 (16.4%) said that they don't have a clean courtyard. Even though the small percentage have no clear courtyard the majority have the advantage of Protecting themselves and their families from diseases, infections, water borne diseases and pollution by keeping their courtyard clean.

Table 12: knowledge and practice of refugee

Variables	*Categories*	*Percentage*
What are the important times to wash hands	Before eating	99
	Before cooking/Meal preparation	89

	After defecation	87
	Before breastfeeding	26
	Before feeding children	18
	After handling a child's stool/changing a nappy/cleaning a child's bottom	9
	Other	2
	I don't Know	6
What is diarrhea transmission method?	Through Contaminated water	82%
	Through Contaminated or undercooked food	77%
	From Unpleasant odors	27%
	From flies	**37%**
	From contact with someone sick with diarrhea or someone who died from diarrhea	**9%**
	Other	**0%**
	Don't Know	**6%**
What are the prevention methods to prevent Diarrhea?	Boil or treat your water/drink clean water	69%
	Wash hands with soap and water	78%
	Cook food well	47%
	Wash fruits and vegetables	23%
	Cleaning cooking utensils	13%
	Clean home with bleach	10%

	Use toilet/latrine facility to defecate Dispose of children's faces in toilet/latrine	7%
	Dispose of children's faces in toilet/latrine	3%
	Bury faeces	0%
	Receive a vaccine	1%
	Store water safely	4%
	Breastfeeding babies	0%
	Cover food	10%
	Other	0%
	Don't know	5%
Participants food Covering practice	No	3.23%
	Yes	96.77

The participants were asked about the important times to wash hands; for which 99% said wash hands before eating, 89% before cooking/Meal preparation and 87% after defecation as critical times of hand washing. Besides, 26% & 18% of the respondents respectively said before breastfeeding and before feeding children, and 19% said after handling a child's stool/changing a nappy/cleaning a child's bottom There were 6% who didn't know critical times of hand washing. This showed us; the critical times as perceived by the respondents varies from household to household. While practicing the most common once, households forget to hand wash in other circumstances which may expose them to disease. Fr most households, even if there is the availability of water and soap there is a lack of knowledge regarding the critical times to wash hands. Correspondingly, a study conducted in Ngala, Dikwa and Banki to determine the knowledge, attitudes, and practices showed based on the scoring of Knowledge at critical times to wash hands, acceptable hand washing practices; 67.2% of respondents had good knowledge of critical times to wash their hands, 20.6% fair knowledge while 12.2% had poor knowledge of critical times to wash their hands. Additional examination revealed that 71.1% had acceptable hand washing practices, 18.8% had fair practices while 10.1% had poor hand washing practices. (International, 2018).

In relation to ways diarrhea can be transmitted; the majority of them (82%) said that people can be infected by diarrhea through contaminated water, & 77% said peoples can be infected through Contaminated or undercooked food. There were a reasonable number of respondents who believed that diarrhea can be contracted from unpleasant odors (27%) and flies (37%). Similarly 9 % of the participants believe contact with someone sick with diarrhea or someone who died from diarrhea can transmit it; the remaining 6 % don't know where peoples can get Diarrhea. This shows us, even if the majority have a knowledge about the transmission method there are a huge proportion of the population who miss to understand the transmission mechanisms. Also, a study conducted in Ngala, Dikwa and Banki to determine the knowledge, attitudes, and practices had similar finding on poor knowledge of in the refugee camps causing high diarrheal infections (International, 2018). This shows that there is a need to create awareness for refugees in camps on hand washing, the consequence of drinking water from unsafe water sources and root causes of many diarrheal and water-borne diseases

Regarding the prevention method of diarrhea; the result revealed that 78% of the households were washing their hands with soap. Other methods in use include boiling to treat drinking water (69%), cook food well(47%), wash fruits and vegetables(23%), practice cleaning cooking utensils (13%) and clean home with bleach(10%), using toilet/latrine facility to defecate(10%) and dispose of children's faces in toilet/latrine10%, and only 10% covering the food to protect from germs and flies and 5%. This result showing that refugee population are have a good knowledge on certain practices while overlooking others. However, prevention of diarrhea need a full range of hygienic and prevention practices across all household activities. A good knowledge and practice of hand washing with poor food hygiene or sanitation in the latrines may not save children and adults from getting diarrhea.

Despite a good use of hand washing and cleaning of water containers, most participants overlook to cover their food. Table 11 presents the data that is helpful to understand whether respondents participants cover their food or not, 360(96.77%) covers the food but 12 (3.23%) of the participants did not cover their food. This shows that a good practice of hand washing and cleaning devices may not solely prevent people from hygiene and sanitation related diseases as contaminations may arise from uncovered food and food containers.

Table 13: Prevalence of diarrhea

variable	*mean*	*Median*	*Sd*	*variance*	*N*	*range*	*min*	*max*

Number of children age of < 5	0.108696	0	0.3756676	.0.1411262	184	2	0	2
Number of children age of 5 and above	0.08871	0	.3523987	.1241849	372	3	0	3

The Table above shows the number of children less than 5 years of age which have had 3 or more loose or watery stools. The maximum number of children under 5 years of age who have had 3 or more loose or watery stools with in a household were 2 with the average number of 0.1 which basically means one in every 10 household had an encounter of diarrhea for children under 5 years of age. This shows that the fact that wastes are not disposed in proper way as shown in the table above (**Error! Reference source not found.**) and due to the reason that some of the participants have a low knowledge of Diarrhea transmission and prevention method (Table 11) is having an impact on the healthy live of children. Similar study in Burao and Garowe and Mogadishu proven that there were poor hygienic conditions due to lack of knowledge about critical times to wash hands causing diarrheal infections (IOM, 2013).

As presented in Table 12 the prevalence of diarrhea among children of age 5 years and above was very much less that those with age less than 5. Based on the result of the study children who have had 3 or more loose or watery stools ranged from maximum number of 3 in a household to none having watery diarrhea. The statistics provides an average of 0.08871.which is interpreted as 1 in a 100 households have had the instances of a watery diarrhea in children of age above five. According to WHO, 2018- diarrhea can be the leading cause of death in Middle East and Africa. Therefore a good hygienic practice it is possible to reduce the death of children and improve the health conditions of children and their families.

4.4. Advocacy and Communication

Advocacy and communication of water use, hygiene and sanitation practices are very important in changing the knowledge, practice and attitudes of people towards safe hygienic practices.

Table 14: communication means

Question	*Response*	*Freq.*	*Percent*
	Bill board/Banner/Poster	3	0.81

What is the best communication means available to receive hygiene messages.	Coffee Discussions	32	8.6
	Community meetings	141	37.9
	Focus Group Discussions	15	4.03
	Home visits from CHWs	133	35.75
	Other	2	0.54
	Printed flyers	1	0.27
	Radio	24	6.45
	SMS	2	0.54
	community Hygiene club	19	5.11
Did you received a visit from a community Health Workers	No	149	40.05
	Yes	223	59.95
Did you attend community meetings	No	146	39.25
	Yes	60.75	59.95

The participants were asked the best communication means available to receive hygiene, majority (37.9%) through community meetings and (35.75%) over home visits from CHWs and very slight percentage of the refugees get the information through Coffee Discussions (8%), Bill board/Banner/Poster (0.81%),Focus Group Discussions (4.03%) and community Hygiene club (5.11%). The remaining get the information from Radio (6.45%) and SMS (0.54). This showed as by using community meetings and visit from CHWs the knowledge of the refugees towards hygiene and sanitation can be increased. This will lead us to decrease the spread rate of diarrhea among the refugees. Similarly, a study conducted in Burundian refugee camp the result indicated that there is a need for strengthening health education and hygiene promotion activities in Mahama and other refugee camp setting in order to increase healthy living condition by avoiding water born disease. (Nahimana, et al., Knowledge, atitude and practice of hygiene and sanitation in a Burundian refugee camp: Implications for control of Salmonella typhi outbreak., 2017).

Table 12 present data helpful to understand whether respondents receive a visit from CHW or not, majority 223HH (59.95) received a visit from community health workers but the remaining 149 (40.05%) they never got a visit from community health workers. This showed as some of the participants haven't received a home visit which will be a cause for low knowledge and practice towards hygiene and sanitation.

The participants were asked if they attend community meetings, majority of the refuges 226 (60.75%) attend community meetings but then again 146 (39.25%) HH don't attend community meetings. This also

indicated that lack of community engagement in hygiene and sanitation will lead to unhealthy community due to lack of knowledge and practice towards hygiene and sanitation

4.5. Accountability and Satisfaction

Table 15: Satisfaction to services

Question	*Response*	*Freq*	*Percent*
Are you satisfied with the water supply	Do not use it/have it	5	1.34
	Satisfied	216	58.06
	Unsatisfied	66	17.74
	Very Satisfied	78	20.97
	Very Unsatisfied	7	1.88
Are you satisfied with hygiene education	Do not know/prefer not to answer	1	0.27
	Do not use it/have it	9	2.42
	Satisfied	186	50
	Unsatisfied	85	22.85
satisfactions with the latrines	Do not use it/have it	7	1.88
	Satisfied	165	44.35
	Unsatisfied	103	27.69
	Very Satisfied	79	21.24
	Very Unsatisfied	18	4.84

As indicated in the above table (58.06%) were satisfied with the water supply, 78(20.97%) were very satisfied with the water supply, 66(17.74%) were unsatisfied. The remaining 7(1.88%) & 5 (1.34%) are very unsatisfied and don't use it. Majority of the respondents are satisfied but significant number of the participant were unsatisfied this is due to inadequate water supply which leads to lack of hand washing practice It also illustrate the satisfaction level with hygiene education, 186 (50%) of the respondents were satisfied and 85(22.85%) of the respondents were unsatisfied. Whereas, 0.27% & 2.42% do not know and do not use it. The result showed even if the majority of the participants were satisfied they were some who are not satisfied with the hygiene education this is due to lack of visit from CHW and activities that engage community in order to increase the knowledge and practice towards hygiene and

sanitation. Satisfactions with the latrines, 165 (44.35%) were satisfied, 103 (27.69%) were unsatisfied and 79 (21.24%) were very satisfied.

4.6 Discussion of research findings

This study found that, the distance traveled to get water from the closet point is 371 meters which is higher than the UNHCR standard due to unavailability of water source on their premises. This showed as the refugees had to travel an average of 4 hours to the closest water point to collect water. On another hand, the average water storage capacity of the households 74 liters and the average water collected for the household is 106L. This result showed us the households don't have enough storage facilities in the households so they have to wait until the collected water is finished in order to refill their container. Beside this some of the respondents haven't got enough water for their households because of water shortage and long waiting time at the water point. As the result of long distance traveling and the low storage capacity the refugees are forced to use other unsafe water source for different household activities this can increase
vulnerability of the refugee to be exposed to water-borne illnesses

This study showed that the highest percentage of participants had adequate practice cleaning drinking water container unlike this the majority of participants do not treat water before drinking which shows that most participants don't understand the importance of treating water and water borne diseases due to lack of knowledge. This Untreated water may contain germs such as bacteria, viruses, parasites, pesticides, fertilizers, and human and animal waste. The impact of drinking untreated water on the health of the refugees may cause variety of illnesses

The participant indicated that the majority of refugees received soap from distribution made by NGO but there are some participants who are not having a soap. This participants used ash and water as a substitute but 11.11% prefer not to use anything. This showed us if the soap is not available there is low hand washing practices at the critical times which will lead the refuges exposed to diarrheal disease due to low hygiene. Similarly a study conducted on IDPs at Lolkuach village the result indicated that both a lack of access to hygiene items, and a poor attitude brought on by a lack of knowledge leads to poor hygiene practices. The participants are not able to practice hygiene because they don't have either the knowledge or the materials to implement. (DRC, 2012).

The result showed us the majority of the participants have no specific hand washing device in the household this can be the cause for low hand washing practices during the important times which has a very big impact on the health of the refugees. Additionally, even if the participants have the hand washing

device 33.33% of the households have no water in the hand washing device this is because of water shortage, long waiting time at water point and low water storage capacity could be the reason for not having water in the hand washing device. This have a negative impact on the health of the refugees.

The result revealed that 91.84% of the latrines provide the service unfortunately 17.74% of adults and 18.48% children under the age of 5 use Open defecation. This showed us even the latrines are available due to low attitude and lack of practice the participants prefer to use open defecation and improper disposal of feces for the children under five who do not use latrine. Unavailability latrines nearby and too dark at night time encourage them to use open defecation. As the result of this they have a chance of having unclean environment which will be a cause of bacteria and viruses to infect the refugees. Furthermore, more than half of the participants do not have a designated bathing facility which can be the main reason for not keeping personal hygiene

This study found that the highest percentage of participants had adequate knowledge on diarrhea transmission and prevention method. Even if the majority have a knowledge about diarrhea there are significant number of the population who don't know the transmission and prevention methods. Lack of knowledge have a greatest input on the high infectious rate and mortality of under children under the age of five due to diarrheal diseases. Similarly a study conducted on Knowledge and Practices of Water, Sanitation and Hygiene the result revealed that knowledge regarding transmission route seemed inadequate. The overall results showed that the knowledge and practice of Water, Sanitation and Hygiene (WASH) is still poor. (Shrestha, Vaidya, Manandhar, & Joshi, 2018)

The prevalence rate of diarrhea were 2 with the average number of 0.1 which basically means one in every 10 household had an encounter of diarrhea for children under 5 years of age and 0.08871.which is understood as 1 in a 100 households have had the instances of a watery diarrhea in children of age above five. This showed us the participants might know some of the prevention method and critical times to wash hands but not the full package. For example they might aware hand washing can prevent the diarrhea and might not cover the food also 99% washed their hands before eating but only 9 % washed after handling a child's stool/changing a nappy/cleaning a child's bottom. Moreover water shortage, low water storage capacity, unavailability of water in the hand washing device, using open defecation, inadequate practice of treating drinking water can be the reason for high diarrhea prevalence rate.

The study showed that majority of the participants get hygiene education through community meetings, over home visits from CHWs and very slight percentage of the refugees get the information through Coffee

Discussions. However, a significant number of the refugee haven’t got home visit from health workers and did not attend community meetings. This have a great contribution why the refugee have a low knowledge and attitude. Likewise, study conducted in Pakistan indicated that hygiene promotion campaigns through media have brought a significant change in perceptions. The result showed that, the knowledge of the target beneficiaries has increased regarding water borne diseases, water purifications and covering water containers. (Laghari, 2014)

CHAPTER FIVE:

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study has investigated the Knowledge, Attitude and Practices (KAP) of refuges on Water, Sanitation and Hygiene issues in selected refugee camp in Tigray Region at Shire Refugee Camp. Based on the data presentation, analysis and interpretation in the fourth chapter, this chapter looks back and presents the Summary, Conclusion and Recommendations. Finally, it presents areas of future research that need to be investigated by future researchers in similar or related issues.

5.2 Summary and Conclusion

This result confirmed that even if 353(94.89%) participant get a water from Public tap/standpipe and 331(88.98%) get the water for free the participants have to travel an average 371 meters in order to access water from the closest water point and it showed that there is uneven distribution of water among the households. This can led to inadequate hand washing practice during important times which can be a cause for different diseases.

This study also assessed the practice of cleaning drinking water container the result showed that the majority of participants have a good practice in cleaning drinking water container. On the hand, the majority of the participants have showed low practice of treating drinking water. This can be the cause of getting infected by diarrheal diseases. Water boiling, and stand and settle are the methods used by the house holds who treated the water.

Over all, almost half of the participant had good level of knowledge while significant number of the refugees had low knowledge level regarding hygiene and sanitation in Shire refugee camp. As a result, 6% didn't know causes of diarrhea disease and important time to wash hands, and 5% of the respondents don't know the prevention method of diarrhea. This is due to lack of hygiene education provided by community health workers, and lack of engagement in community meetings where hygiene education is provide.

As a final point, NGO and government work in consortium to provide WASH services to refugees living in the camps. The respondents were asked about the satisfaction on water supply, hygiene education and latrines. The result showed us the majority number of the participants were satisfied with the service

however, there is a significant percentage of participants who are not satisfied. This requires attention by the organization providing hygiene, sanitation and water services.

5.3 Recommendations

The government is advised to put in place standard packages for sanitation, hygiene and water supply. It is apparent that there are standards by international agencies such as the UNHCR and IOM on WASH standards and procedures, however similar standards need to be adopted for the country on latrine construction specifying distance and quality, water supply facilities and awareness creation packages.

As lifeline to the communities, water availability is the key to sanitation and hygiene as well as a major source of input for food preparations and drinking. The respondents were found lacking adequate water storage facilities which led them to store less water in the household and increase the back and forth to fetch water from water points. Therefore, distribution of Jericans and other water containers are highly recommended to support families have adequate water availability in the household.

One of the challenge observed from the findings of the study include people not being able to use latrines due to unavailability of light for the infrastructures and distance from the premises where the refugees are widely residing. Next plans to construct latrine infrastructures need to consider the distance and availability of light in the infrastructures. This will also address protection issues raised by women as women and children fear to go and use the latrines which are far and dark at night for safety concerns.

Most respondents were very good in practicing hygienic practices which are most common such as nad washing and using latrines; however majority have missed to practice hygienic practices at other critical moments such as hand washing after changing diapers for children, covering food and cooking or washing fresh foods from the market. So during awareness creation sessions, the researcher recommends education to the communities on the full ranges of practices which can help the communities' protect themselves from disease transmission and ill-hygiene born disease. The media should also work closely with the refugees in promoting the importance of hygiene and sanitation for a better life.

There are general strategies and guidelines for the country to implement WASH across Ethiopia. The strategies have not be contextualized to refugee situation and emergency WASH strategies are being implemented to refugee contexts. Even though, the refugees are in an emergency situation there are several factors that make refugee situation different from other emergency crises such as the settlement pattern,

socio-economic situation, and safety and protection issues. Thus implementing agencies need to come up with a refugee camp specific strategy and guideline for implementation of WASH interventions.

Practice by the community was also found to be crucial in the betterment of their lives. The community is recommended to contribute to the improvement of hygiene and sanitation conditions as well as behavior changes by increasing engagement in community meetings and coffee ceremonies where hygiene and sanitation educations discussed. Increase their self-reliance and resilience by participating in different livelihood activities.

While doing this study it was very hard to find a KAP study conducted in Ethiopia related to hygiene and sanitation. The researcher understood than continuous monitoring practices are lacking by implementing agencies and the government. Therefore a continuous monitoring framework to collect key indicators for WASH projects, on a quarterly basis with a representative sample size. This can help to take a corrective action on time if there is something wrong with the plan or the implementation.

From the satisfaction questions in the survey and other descriptive analysis, the researcher came to understand that during project design, refugees are not consulted enough and their opinions not heard at an adequate level. WASH project implementing organizations should pay attention to the needs and ideas of the beneficiaries and need to be incorporated in the design phase for better outcome and project success.

There are community workers supporting the community in hygiene and education; their support has been admired by the community as the major source of information for the refugee community in addition to community meetings. Enhancing the capacity of the community workers and advancing the scale of reach to more refugee communities would help support more communities on hygiene and sanitation.

This study only represent shire refugee camp towards knowledge, attitude and practices on hygiene and sanitation. A comparative study could be conducted in other refugee camps in order to share experiences. A study could be conducted using further quantitative methodology to estimate the magnitude of public health risks which result from poor hygiene and sanitation practices in refugee’s camps.

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ANNEX I

Interview and Observation Guideline

INTRODUCTION

Please read this out loud

Hello, my name is Betselot and I would like to ask you a few questions about your experience on water, sanitation and hygiene services. I use this survey to help define the knowledge, Attitude and Practice in relation to WASH. This survey is anonymous, and You can request to stop the survey or refuse to answer a question at any point. Do you agree to continue?

I. Did the household give its consent to be interviewed?

If not, this is the end of the survey.

☐Yes

☐No

☐Absent

II. Date of Interview

yyyy-mm-dd

III. Tick the camp in which you conduct this survey

☐Shimelba

☐Histast

☐Adharush

☐Mayinni

IV. Zone

☐Zone A /1

☐Zone B/2

☐Zone C/3

☐Zone D/4

☐Zone E/5

☐Zone F/6

☐Zone G/7

☐Zone H/8

☐Zone I/9

☐Zone J/10

☐Zone K/11

☐Zone L/12

A. GENERAL INFORMATION AND DEMOGRAPHICS

A.1. Sex of the respondent

☐Male

☐Female

A.2. How many people slept in this house last night?

A.3. How many children less than 5 years old live and slept in this house last night?

A.4. Are there any persons with disabilities and / or elders in this household?

☐Yes

☐No

A.5. Please tell me what your country of origin is:

☐Eritrea ☐ Kenya ☐Sudan

☐Somali ☐South Sudan ☐Yemen

☐Other

B. WATER COLLECTION AND STORAGE

B.1.What is the principal source of drinking water for members of your household? CONSIDER WATER FOR DRINKING, COOKING, BATHING, PERSONAL HYGIENE, LAUNDRY AND CLEANING ONLY - NOT FOR NON-DOMESTIC USE

☐Public tap/standpipe

☐Handpumps/boreholes

☐Water seller/kiosks

☐Piped connection to house (or neighbour's house)

☐Protected spring

☐Bottled water, water sachets

☐Tanker truck

☐Unprotected hand-dug well

☐Surface water (lake, pond, dam, river)

☐Unprotected spring

☐Rain water collection

☐Other

☐Don't know

B.2. Aside from this main source, what is the second most used source of drinking water for members of your household? ; CONSIDER WATER FOR DRINKING, COOKING, BATHING, PERSONAL HYGIENE, LAUNDRY AND CLEANING ONLY - NOT FOR NON-DOMESTICUSE

☐Public tap/standpipe

☐Handpumps/boreholes

☐Water seller/kiosks

☐Piped connection to house (or neighbour's)

☐Protected spring

☐Bottled water, water sachets

☐Tanker trucks

☐Unprotected hand-dug well

☐Surface water (lake, pond, dam, river)

☐Unprotected spring

☐Rain water collection

☐Other

☐Did not collect from another source

☐Don't know

B.3. what sources of water do you use for other activities (non-drinking water: animal water, gardening, bricks, etc.)?

☐Public tap/standpipe

☐Handpumps/boreholes

☐Water seller/kiosks

☐Piped connection to house (or neighbour's house)

☐Protected spring

☐Bottled water, water sachets

☐Tanker truck

☐Unprotected hand-dug well

☐Surface water (lake, pond, dam, river)

☐Unprotected spring

☐Rain water collection

☐Other

☐Don't know

Please request the respondent to show you all the containers that they have before you ask the following set of questions.

B.4. How many containers do you have to COLLECT and STORE drinking water for your house?

B.5. Please show me all of them one by one. Enumerator: Record one by one

[NOTE FOR VALIDATION] Total quantity potable water: 0L, Total quantity potable and protected water: 0L, Total quantity transported water: 0L, Total quantity storable water: 0L.

[NOTE FOR VALIDATION]Average quantity potable water: 0L, Average quantity potable and protected water: 0L, Average quantity transported water: 0L, Average quantity storable water: 0L.

B.6. Is there a water source available directly on the premises (in the courtyard, close to the house)?

☐Yes

☐No

B.7. how long does it take to go one direction to get water?In minutes (on the way to the source, not the way back. not including the time spent socializing)

The distance to closest water point is therefore evaluated to be about m.

PLEASE MODIFY YOUR PREVIOUS ANSWER IF THIS DOES NOT SEEM CORRECT

B.8. Do you collect enough water to meet all your households needs?This does not include animal use, brickmaking, agriculture, gardening, etc.

☐Yes

☐No

B.9. Why not? select the main reason only

☐There are water shortages

☐Water is too far

☐It is too dangerous to get water

☐Can't afford to buy enough

☐Waiting time at the water point is too long

☐Don't have enough storage containers

☐Limitation of volume of water that can be collected at water point

☐Other

B.10. Did you drink water directly from the river or canal (or any source of surface water) within the last 7 days? For example, you may have drank water from the river or canal (or any source of surface water) when you were away from your home

☐Yes

☐No

B.11. Do you pay for your drinking water?

☐Yes, per period of time

☐Yes, per container/volume

☐No

☐I don't know

B.12. How often do you clean your drinking water containers?

☐Every time we use them

☐At least once a week

☐At least once a month

☐At least once a year

☐Never or less than once a year

☐Don't know

B.13. How do you clean your drinking water containers?

☐Wash them with a specific product (such as Omo detergent or bleach, soap powder etc.)

☐Rinse them with water

☐Wash them with a piece of tissue/sponge

☐Wash them by using rocks/sand and shaking

☐Other

☐Don't know

C. DRINKING WATER HYGIENE

C.1. Do you or someone else in the household do anything to your water to make it ready to drink?

☐Yes, we always treat it before drinking

☐Yes, SOMETIMES treat it before drinking

☐No, do not treat it before drinking

☐Don't know

C.2. What do you or someone else in the household do to this water to make it ready for drinking?

☐Let it stand and settle

☐Boil it

☐Expose it to sunlight

☐Use disinfection products

☐Filter it

☐I don't know

☐Other

C.3. When did you or someone else in the household last treat water for drinking?Treating consists of boiling, filtering, disinfecting, and/or other actions taken to 'clean' water.

☐Today

☐Yesterday

☐Before yesterday

☐Don't know

D. HYGIENE

D.1. Please show me the soap you have in the household. Was it presented within one minute?

Observe and record the answer.

☐Yes

☐No

D.2. from where did you get your soap?

☐Purchased

☐Traded

☐Gifted

☐Distributed by a NGO

☐Other

D.3. Please tell me the main reason why your household does not have soap?

☐Ran out of soap/Used it
☐Cannot afford soap?

☐Soap is unavailable/cannot find soap

☐Soap is unnecessary

☐Don't like soap

☐Other

☐Don't know

D.4. When there is no soap in your household, what do you use for hand washing?

☐Water only

☐Ash

☐Sand

☐Do not use anything

☐Other

☐Don't know

D.5. Please name at least 3 of the most important times when someone should wash their hands

☐Before eating

☐Before cooking/meal preparation

☐After defecation

☐Before breastfeeding

☐Before feeding children

☐After handling a child's stool/changing a nappy/cleaning a child's bottom

☐Other

☐Don't know (more than already mentioned)/no response

D.6. is there a specific hand washing device/station IN YOUR HOUSE where your household washes their hands? If yes, ask to see the device/station.

☐Yes

☐No

D.7.Observation; What type of handwashing device? Do not ask this question aloud, observe and record the answer.

☐Basin or bucket

☐Pouring device (e.g. tipi tap)

☐Bouta

☐Other

D.8. Observation: Is there water in the hand washing device/station?Do not ask this question aloud, observe and record the answer.

☐Yes

☐No

D.9.Observation: Is there soap/ash in the area of the hand washing device/station?Do not ask this question aloud, observe and record the answer.

☐Yes

☐No

D.10.Observation: Is food covered and protected from flies? Do not ask this question aloud, observe and record the answer.

☐Yes

☐No

E. SANITATION

E.1. Where do you and your household members (EXCLUDING children under 5) usually go to defecate? Is considered communal (or shared) a latrine used by more than one household

☐Household latrine

☐Shared Latrine

☐Open defecation

☐Plastic bag

☐Bucket toilet

☐Other

☐Don't know

E.1.a. If other, please specify:

E.2. Where do children under-5 living in this household usually go to defecate? Is considered communal (or shared) a latrine used by more than one household

☐Household latrine

☐Shared Latrine

☐Open defecation

☐Plastic bag

☐Plastic pot

☐Other

☐Don't know

E.3. For the children under 5 that don't use the latrine, what is done with their faeces?

☐Collected and disposed in latrine

☐Collected and disposed of elsewhere

☐Buried it

☐Other

☐Don't know

☐Nothing is done with it

E.4. Do adult members of your household sometimes defecate in the open air (for example at night)?

☐Yes

☐No

E.4.a. If so why?

☐Latrine is too far

☐Too dark at night

☐Too tired

☐There is no latrine available

☐Don't know/Not sure

☐Other

E.5. What is the type of facility where your household members usually defecate?

☐Single household facility (used only by this household)

☐Shared facility used by a number of households

☐Communal latrine

☐Other

E.5.a. If other, please specify:

E.6. Is the latrine in use? Do not ask this question aloud, observe and record the answer

☐Yes

☐No

E.7. Is there a hand washing station at the latrine? Do not ask this question aloud, observe and record the answer

☐Yes

☐No

E.8. Indicate whether there is water in the hand washing station

Do not ask this question aloud, observe and record the answer

☐Yes

☐No

E.9. Is soap present at the hand washing station? Do not ask this question aloud, observe and record the answer

☐Yes

☐No

E.10. Please show me the facility where you and your family members bathe. Do they have a designated bathing facility AT HOME? Observe and record the answer.

☐Do not have a designated bathing facility

☐Have a designated shower/bathing facility

☐Don't know or can't observe

E.11. Where does your household dispose of domestic waste?

☐Household pit

☐Communal pit

☐Designated open area

☐Undesignated open area

☐Bury it

☐Burn it

☐Street bin/container for garbage collection

☐Other

E.12. Is the courtyard/concession clean (no apparent trash scattered around)?Observe and record the answer.

☐Yes

☐No

E.13. Did you or anyone in your household complain of or observe any abnormal presence of vectors recently?

☐Rodents

☐Mosquitoes

☐Flies

☐Cockroaches

☐Others

☐Did not observer any vectors

F. MESSAGING

F.1. which one of the following are Best communication means available to receive hygiene and health messages?

☐Radio

☐SMS

☐Printed flyers

☐Home visits from CHWs

☐Community meetings

☐Focus Group Discussions

☐Other

☐Community Hygiene club

F.2. In the last month did your household receive a visit from a community health worker to discuss any health or hygiene messages?

☐Yes

☐No

F.3. In the last month, have you or anyone in your household attended a health or hygiene community meeting?

☐Yes

☐No

G. Diarrhea Prevalence, Knowledge and Health Seeking Behavior

G.1. How many children less than 5 years of age have had 3 or more loose or watery stools in the last 14 days?

G.2. How many persons 5 years of age or older have had 3 or more loose or watery stools in the last 14 days?

G.3. Can you tell me all the ways that people can get diarrhea? With responses, allow respondent to list and check those that are listed

☐Through contaminated water

☐Through contaminated or undercooked food

☐From unpleasant odors

☐From flies

☐From contact with someone sick with diarrhoea or someone who died from diarrhoea

☐From swimming/bathing in surface water

☐Other

☐Don't know

G.4. Please tell me all the ways to prevent you or your household members from getting diarrhea? With responses, allow respondent to list and check those that are listed

☐Boil or treat your water/drink clean water

☐Wash hands with soap and water

☐Cook food well

☐Wash fruits and vegetables

☐Cleaning cooking utensils

☐Clean home with bleach

☐Use toilet/latrine facility to defecate

☐Dispose of children's faeces in toilet/latrine

☐Bury faeces

☐Receive a vaccine

☐Store water safely

☐Breastfeeding babies

☐Cover food

☐Other

☐Don't know

H. Client Satisfaction

H.1. How satisfied are you with the latrines?

☐Very Satisfied

☐Satisfied

☐Unsatisfied

☐Very Unsatisfied

☐Do not know/prefer not to answer

☐Do not use it/have it

H.2. How satisfied are you with the showers?

☐Very Satisfied

☐Satisfied

☐Unsatisfied

☐Very Unsatisfied

☐Do not know/prefer not to answer

☐Do not use it/have it

H.3. How satisfied are you with the hygiene education?

☐Very Satisfied

☐Satisfied

☐Unsatisfied

☐Very Unsatisfied

☐Do not know/prefer not to answer

☐Do not use it/have it

H.4. How satisfied are you with the water supply system?

☐Very Satisfied

☐Satisfied

☐Unsatisfied

☐Very Unsatisfied

☐Do not know/prefer not to answer

☐Do not use it/have it