

**YANGON UNIVERSITY OF ECONOMICS  
DEPARTMENT OF APPLIED ECONOMICS  
MASTER OF PUBLIC ADMINISTRATION PROGRAMME**

**A STUDY ON KNOWLEDGE, ATTITUDE, AND PRACTICE  
OF RURAL COMMUNITY ABOUT WATER, SANITATION  
AND HYGIENE PRACTICES IN NORTHERN SHAN STATE  
(Case study in Lashio Township)**

**AUNG KYAW HTET  
EMPA - 1 (17<sup>th</sup> BATCH)**

**OCTOBER, 2022**

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A thesis submitted as a partial fulfillment towards the requirements for the degree of  
Master of Public Administration (MPA)

**Supervised by:**

Dr. Tin Tin Wai  
Pro-Rector  
Yangon University of Economics

**Submitted by:**

Aung Kyaw Htet  
Roll No. 1  
EMPA (17<sup>th</sup> Batch)  
(2018 – 2020)

**October, 2022**

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MASTER OF PUBLIC ADMINISTRATION PROGRAMME**

This is to certify that this thesis entitled “**A Study on the Knowledge, Attitude and Practice of Rural Community about Water, Sanitation and Hygiene Practices in Lashio Township, Northern Shan State**” submitted as the requirements for the Degree of Master of Public Administration has been accepted by the Board of Examiners.

**Board of Examiners**

-----  
Dr. Khin Thida Nyein  
(Chief Examiner)  
Pro-Rector  
Yangon University of Economics

-----  
Professor Dr. Kyaw Min Htun  
(External Examiner)  
Pro-Rector (Retd)  
Yangon University of Economics

-----  
Dr. Su Su Myat  
(Examiner)  
Professor/Head  
Department of Applied Economics  
Yangon University of Economics

-----  
Daw N Khum Ja Ra  
(Examiner)  
Associate Professor  
Department of Applied Economics  
Yangon University of Economics

-----  
U Khun Maung Gyi  
(Examiner)  
Associate Professor  
Department of Applied Economics  
Yangon University of Economics

-----  
Professor Dr. Tin Tin Wai  
(Supervisor)  
Pro-Rector  
Yangon University of Economics

**October, 2022**

## **ABSTRACT**

This study is to assess and analyze the level of knowledge, attitude and practice on water, sanitation, and hygiene of the rural communities in Lashio Township of Northern Shan State in Myanmar. Safe water, sanitation, hygiene practices have the great prospects to decrease the mortality rate due to lack of hygiene and diarrhea disease. This study is used descriptive methods by using secondary and primary data and multistage cluster sampling method. A total of 357 households were selected as sample and the data was collected by using face to face interview with structured questionnaire. Most remarkable findings were: more community participation and development of community groups, better water supply, improved community awareness on hygiene, better waste disposal system in the village and households; more access to handwashing facilities and improved handwashing behavior; improved knowledge about diarrhea; and better practice of using mosquito nets at night as well as communities should maintain good behaviors and good practices and still need to change some bad behaviors and need to improve latrine design, handwashing facilities, personal hygiene and so on. Among the respondents, it was found that the communities are good attitude and practices of water, sanitation and hygiene. Recognizing the level of knowledge, attitude and practice on water, sanitation and hygiene of the rural communities is an important step in the search for the answers needed in the WASH sector of the Lashio area. The survey aimed to current understanding, attitudes and practices regarding Water, Sanitation, Hygiene, Waste Management.

## ACKNOWLEDGEMENTS

First of all, I would like to express my sincere thanks to Rector Dr. Tin Tin Htwe, Yangon University of Economics, Pro-Rector Dr. Tin Tin Wai for giving me the opportunity to submit this thesis.

In addition, I wish to express my deepest appreciation to Professor Dr. Kyaw Min Htun, Pro-Rector (Retd.) of Yangon University of Economics and all Professors, Associate Professors and Lecturers of MPA Programme for their academic advice, guidance for the thesis and sharing knowledge and experiences during my studies.

Besides, I would like to express appreciation to Professor Dr. Su Su Myat, Programme Director and Head of Department of Applied Economics, Yangon University of Economics for her guidance and lectures during the class and for her patience and motivation of completing this thesis.

I am highly indebted to my supervisor Dr. Tin Tin Wai, Pro-Rector, Yangon University of Economics for her encouragement, patience, valuable and constructive suggestion, guidance, and supervision throughout the preparation of this thesis.

Finally, I would like to express my thankfulness to my friends from MPA 17<sup>th</sup> Batch for their kindness, support, and encouragement during the course of my study and my particular thanks to my friends who particularly give their time and assistance in the preparation of this thesis.

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## LIST OF ABBREVIATIONS

ADB	Asian Development Bank
BCC	Behaviors Change Communication
CDD	Community Driven Development
CDD	Community Driven Development
CLTS	Community Led Total Sanitation
CSO	Civil Society Organization
DRD	Department of Rural Development
DRR	Disaster Risk Reduction
EAO	Ethnic Armed Organization
FAO	Foods and Agriculture Organization
FGD	Focus Group Discussion
GDP	Gross Domestic Product
HE	Health Education
HH	Household
IEC	Information, Education, and Communication
INGO	International Non-Government Organization
JICA	Japan International Cooperation Agency
JMP	Joint Monitoring Programme
KAP	Knowledge, Attitude and Practice
MDG	Millennium Development Goal
MDHS	Myanmar Demographic and Health Survey
MoAI	Ministry of Agriculture and Irrigation
MoH	Ministry of Health
NGO	Non-Government Organization
NRW	Nonrevenue Water
NRWR	Natural Renewable Water Resources
O&M	Operation and Maintenance
ODF	Open defecation free
ORT	Oral rehydration therapy
RRD	Relief and Resettlement Department
SDG	Sustainable Development Goal

UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
VIP	Ventilated improved pit
VWC	Village Water Committee
WASH	Water and Sanitation Hygiene
WHO	World Health Organization
WUG	Water User Group
YCDC	Yangon City Development Committee

# CHAPTER 1

## INTRODUCTION

### 1.1 Rationale for the Study

Access to Clean water, sanitation and hygiene are fundamental for human beings to be survived, healthy and grown. Water is the most treasurable and important among resources available on earth. Access to clean water should be outlined as a human right. Safeguarding the right to use to clean water could significantly decrease the global problem of disease. Millions of people all over the world are affected every year by a range of waterborne diseases. (UN, 2002). Over one hundred thousand deaths of under-five children occurred due to unprotected drinking water, unavailability of basic sanitation, and unhygienic in the world. (UN, Committee in Economic, Social and Cultural Rights 2002)

In Myanmar, much of the population in rural areas of Myanmar are without access to clean water and sanitation and waterborne diseases are a major cause of illness and death, especially amongst children. Many communities have insufficient and degraded water points, atrocious public and household sanitation, and a very low quality of institutional (in particular school) hygiene facilities. Acute water shortages across parts of the country remain many communities extremely vulnerable and often forces households to borrow money in order to purchase water, locking them into a downward spiral of poverty.

According to Myanmar Demographic and Health Survey, 37 percent of all households have safe drinking water on their premises, including 30 percent of urban households and 39 percent of rural households. Over half (56 percent) of households in Myanmar must get their water off their premises and spend less than 30 minutes round-trip. Only 6 percent of households spend 30 minutes or longer getting water. The most common type of toilet facility in rural areas is an open pit or a pit latrine without a slab (31 percent). (Ministry of Health Myanmar report (MoH, 2015 - 2016)).

Despite the relatively high average figures for access to clean water and improved sanitation as well as evidence of good levels of hygiene and sanitation

understanding, health statistics continue to indicate high levels of diarrhea. There are clear indications that much remains to be done to ensure that everyone in Myanmar can access clean water, improved sanitation and the hygiene and sanitation information they need to ensure good health. According to the Lashio GAD data, 14 shallow tubes well, 42 drilled well, 3542 hand dug well, 321 gravity flow water systems (GFWS) are access water for Lashio communities.

Especially people in the conflict-affected area of Northern Shan State could not able to access clean water and lead to suffering waterborne diseases with poor sanitation knowledge. In towns of northern Shan State, water mainly comes from wells, while in rural areas rainwater is collected in traditional ponds. In both cases poor management of water resources and contamination are problems. In towns, most families have access to latrines, but access to latrines less in rural areas, while some individuals continue to resist using latrines even if they are available (UNHabitat).

The cases of major disease (List by Rural Health Centers in 2017 (January to June)) are Diarrhea, Amoebic / Dysentery, Acute Respiratory Infection and Malaria.

In the rural areas of Lashio Township, 53.5 per cent of the households use water from unimproved sources for drinking water. The 8.6 per cent of the households in Lashio Township have no toilet facilities Inadequate improved WASH significantly contributed to common childhood illnesses among children in Lashio Township (please see above table). (UNFPA, Department of Population, 2014).

Due to inaccessibility, some rural villages in Lashio, Northern Shan State have underprivileged and lack of access to awareness and knowledge in importance of sanitation and hygiene for health with the reasons of inadequate number of health care professionals, lower educational status, and lack of electricity. Accordingly, incidences and morbidity rates of some communicable diseases mainly diarrhea, dengue, typhoid fever, and malaria were high every year.

By addressing on the Water Sanitation and Hygiene in Lashio Township, some international organizations, United Nations, and Local organizations are working to provide water supply and promote sanitation and hygiene knowledge and practices. In Lashio, Save the children and UNICEF are working for Water, Sanitation and hygiene but mostly focus to the IDPs camps. And most of organizations are not focusing to WASH as a main project in village level. The people who stay in northern Shan state are difficult to get the health education awareness than other part of Shan state. These

are the reasons why choose this area for study. Thus, it is needed to study the level of health knowledge and education on health, in their daily life, livelihood and habits.

## **1.2 Objective of the Study**

The objective of the study is to assess and analyze the level of knowledge, attitude and practice on water, sanitation and hygiene of the rural communities in Lashio Township of Northern Shan State.

## **1.3 Method of Study**

This study used descriptive methods by using secondary and primary data based on the knowledge, attitude and practices against demographic and health status background of the selected household in the rural area of Lashio Township. The purposive multistage cluster sampling method is used with structured questionnaires. A total of 357 households were selected as sample and information are collected by using face to face interview with structured questionnaire. Secondary data and information are obtained from relevant books, research papers and reports of Ministry of Health (MoH) and UNICEF.

## **1.4 Scope and Limitations of the Study**

The study was mainly focused to the households in the 18 villages of Lashio township. This study covered access to clean water, proper sanitation, and hygiene by mainly observing on the knowledge, attitude and practices in rural households of Lashio Township, Shan State.

## **1.5 Organization of Study**

The study is organized with five chapters. The Chapter 1 is the introduction, which includes the rationale of the study, objectives of the study, method of the study, scope and limitation of the study and organization of the study will be included. Chapter 2 is mainly for Literature Review including clean water accessibility, Water Supply, Sanitation and Hygiene Standard by Sphere Standard, Worldwide, Progress on Household Drinking Water, Sanitation and Hygiene, Access to Water (WASH) in Least Developed Countries, Access to Water Accessibility, Sanitation facilities, Health Knowledge and Hygiene Practices and reviews on previous studies. Chapter 3 focuses on the water supply and clean water accessibility in Myanmar, WASH policies

and priorities of Myanmar and Sanitation and Hygiene status of Myanmar. Chapter 4 presents the survey analysis on the assessment of Knowledge, Attitude and Practice of water and sanitation, health and hygiene practices who living in rural communities in northern part of Lashio Township. Finally, Chapter 5 draws the conclusion with findings and recommendation.



## **CHAPTER 2**

### **LITERATURE REVIEW**

The aim of any WASH programme is to promote good personal and environmental hygiene to protect health, as shown in the diagram below. An effective WASH programme relies on an exchange of information between the agency and the disaster-affected population to identify key hygiene problems and culturally appropriate solutions. Ensuring the optimal use of all water supply and sanitation facilities and practicing safe hygiene will result in the greatest impact on public health.

WASH practitioners have had to evolve their approach given the diversity of humanitarian crises. Design, implement, monitor, and evaluate all WASH programmes as an exclusive package water supply, sanitation and hygiene promotion as WASH. Sanitation programme activities require water supply and hygiene promotion, they are complementary. So, practitioners should ensure they have the capacity and skills to deliver water supply, sanitation, and hygiene promotion as one. (WASH – Sphere handbook 2018)

#### **2.1 Water Supply, Sanitation and Hygiene Standard by Sphere Standard**

The Sphere standards which are standards and minimum humanitarian protocols in thematic areas of humanitarian response: Water supply, sanitation, and hygiene promotion.

Water Supply Standard 1: Access and water quantity, all people have unrestricted, equitable and affordable access to enough water to fulfil their drinking, cooking, personal and domestic hygiene needs. Supply points are sufficiently close to users. Outcome Indicators: Sustained access to satisfactory water supply is universal. M&E version: (or percent) of individuals have sustained and equitable access to satisfactory water supply. Water Supply Standard 2: Water safety: Water is palatable and of sufficient quality for drinking and useable for cooking and personal and domestic hygiene without causing risk to health. Outcome Indicator 1: Water safety plans (WSP) are implemented covering all water supply systems. M&E version: (or percent) of water

supply systems covered by an effective water safety plan. Outcome Indicator 2: All users drink water that is free from fecal contamination and priority chemicals. M&E version: (or percent) of users drinking water that is free from fecal contamination and priority chemicals.

Basic survival water needs minimum is Survival needs: water intake (drinking and food), 2.5-3 liters per day. Depends on the climate and individual physiology. Basic hygiene practices/ use is 2-6 liters per day. Depends on social and cultural norms. Basic cooking needs is 3–6 liters per day. Total basic water needs is 7.5-15 liters per day (Sphere)

Sanitation Standards: What is a “toilet”? Different words are used in the WASH sector. Sometimes those words mean the same thing. Sometimes they mean slightly different things. Sometimes they mean extremely different things. The purpose of this Handbook, we will use the word “toilet” to mean any facility or device that immediately and initially contains excreta and creates the first barrier on the F-diagram between people and the waste. This could be a bucket, a potty, a pit toilet, a VIP, a plastic bag, a commode, a pour-flush toilet, a defecation field.

Excreta Management Standard 1: Environment free from human faces: The environment in general and specifically the living areas, food production areas, learning spaces, health centers, communal WASH facilities, public centers and the environment surrounding drinking water sources are free from human fecal contamination.

Safe excreta disposal keeps the environment free of uncontrolled and scattered human faces. Immediately after a disaster and during the development of an excreta disposal management plan, consider implementing an initial clean-up campaign, demarcating, and cordoning off defecation areas, and siting and building communal toilets. A phased approach to solving the sanitation problem is most effective. Where the affected population has not traditionally used toilets, it will be necessary to conduct a concerted hygiene promotion campaign to encourage safe excreta disposal and to create a demand for more toilets. In urban disasters where there could be damage to existing sewerage systems, assess the situation and consider installing portable toilets or use septic and/or containment tanks that can be regularly dislodged. Give due consideration to desludging, handling, transportation, and final disposal of the sludge. Outcome Indicator: The environment in which people live, learn and work is always free of human faces.

Excreta Management Standard 2: Containment of excreta: All affected people have adequate, appropriate, and acceptable toilets, sufficiently close to their living spaces to allow rapid, safe, and secure access always, day and night.

What is an acceptable toilet? A successful excreta containment program depends on an understanding of people's varied needs and their participation. General guidance on acceptability is that toilets be: safe to use for all sections of the population, including children, older people, pregnant women and persons with disabilities; sited in such a way as to minimize security threats to users, especially women and girls, throughout the day and the night; provide a degree of privacy in line with the norms of the users; sufficiently easy to use and keep clean; do not present a hazard to the environment; appropriately provided with water for handwashing anal cleansing and/or flushing; allow for the dignified disposal and/or cleaning and drying of women's menstrual hygiene materials; minimize fly and mosquito breeding; and minimize smell.

Excreta Management Standard 3: Excreta transport, disposal, and treatment: Appropriately treat and dispose of excreta after containment. Safely transport excreta from initial containment to another site for treatment and disposal. Onsite treatment and disposal is safe and hygienic and has a minimum impact on the surrounding environment.

In high water table or flood situations, make the pits or containers for excreta watertight to minimize contamination of groundwater and the environment. Desludging: When appropriate, and depending on the need, consider desludging of toilets/septic tanks and excreta containers, including siting of final sewage disposal point from the start of planning. Distance of defecation systems from water sources: Calculate the distance of soak pits, trench latrines and/or toilets from water sources based on... Site them at least 30 meters from water sources. Construct the bottom of the pits at least 1.5 meters above the groundwater table. Increase these metrics for fissured rocks and limestone or decrease them for fine soils. Pollution is not an immediate concern when groundwater is not drunk. Instead, adopt household-level water treatment or other options. Build elevated toilets or septic tanks to contain excreta and prevent it contaminating the environment in flooded or high-water table environments. Preventing drainage or spillage from septic tanks from contaminating surface water and/or groundwater sources is an imperative. Outcome Indicator: The environment surrounding settlements, especially surface and groundwater sources, is always free of human feces.

Basic needs - Improved sanitation facilities are likely to ensure hygienic separation of human excreta from human contact.

*Hygiene standard 1:* Hygiene promotion implementation: Affected people are aware of key WASH-related public health risks and mobilized to adopt individual, collective, and societal measures preventing the deterioration in hygienic conditions and increasing health-seeking behaviors.

Handwashing being a key barrier to fecal-oral transmission of diarrheal diseases is critical in all our responses. Promotion as soon as feasible is key with access to easy-to-use handwashing facilities, with the household/communal sanitation. Rapid formative research can analyze the gap between knowledge and practice and identify the key motivational factors to promote good practice (for example, nudges footsteps/slabs from the latrine to the handwashing facility, provision of a beautiful space at the handwashing station by providing a mirror, health-seeking behavior images etc.).

*Outcome Indicator:* Communities engage and understand key WASH public health risks, the measures to prevent them and promote health-seeking behaviors. Community access to facilities, services, and goods to put their health seeking-behaviors in practice and use and maintain the WASH facilities and services.

*Hygiene standard 2:* Identification and use of hygiene items: The affected population has access to and identifies and promotes the use of hygiene items that ensures personal hygiene, health, dignity, and well-being. Ensure the accessibility of handwashing facilities via a clear path that is free of obstructions and that the tap and soap are reachable from a seated position and are child height. Ensure that the tap is operable with ease (foot, turning of tap with hand or one closed fist). Outcome Indicator: Equipping of all household members with necessary and satisfactory hygiene items that protect them from public health risks and promote their dignity and sense of well-being.

*Basic need of Handwashing:* Clean your hands by rubbing them with an alcohol-based formulation, as the preferred mean for routine hygienic hand antisepsis if hands are not visibly soiled.

## **2.2 Progress on Household Drinking Water, Sanitation and Hygiene (Worldwide)**

**Drinking Water:** In 2020, 74 percent of the global population used safely managed drinking water services, 60 percent in rural and 86 percent in urban. 2 billion people lacked safely managed services, including 1.2 billion people with basic services, 282 million with limited services, 367 million using unimproved sources, and 122 million drinking surface waters. Estimates for safely managed services were available for 138 countries and five out of eight SDG regions, representing 45 percent of the global population. Achieving universal access to safely managed services by 2030 will require a 4x increase in current rates of progress (10x in least developed countries (LDCs) and 23x in fragile contexts).

**Sanitation:** In 2020, 54 percent of the global population used safely managed sanitation services, 44 percent in rural and 62 percent in urban. Estimates for safely managed services were available for 120 countries and seven out of eight SDG regions, representing 81 percent of the global population. Achieving universal access to safely managed services by 2030 will require a 4x increase in current rates of progress (15x in LDCs and 9x in fragile contexts).

**Hygiene:** In 2020, 71 percent of the global population had basic handwashing facilities with soap and water at home. Estimates were available for 79 countries and four out of eight SDG regions, representing 50 percent of the global population. Achieving universal access to basic services by 2030 will require a 4x increase in current rates of progress (7x in LDCs and 5x in fragile contexts). 2000-2020: Five Years into the SDGs.

### **2.2.1 Water, Sanitation and Hygiene Problems**

Water, Sanitation and Hygiene (WASH) are main concerns that impact the health of everyone in the world. Everyone should have clean water to drink, a safe place to pee and poop. The quality of safe water, good sanitation and proper hygiene is directly related to poverty, and it is linked by poor of education, limited of opportunity and gender inequality. Not having adequate sanitation generally refers open defecation. When communities dispose in the open without a systematic disposal management system, then the feces normally seep into and contaminates water systems. Just using in an open defecation area can cause disease.

The crisis is intense in Sub-Saharan Africa, Southern Asia, and Eastern Asia. The country with the most people needing sufficient WASH is India. Young women and girls faced the hardest by lack of clean water and proper sanitation for several reasons. When schools can't be able to provide functional toilets or latrines, girls frequently drop out because of the shame related with periods. Moreover, when families don't have adequate water, girls are pushed to travel hours to gather water, leaving limited time for school. This lack of education is the major causes of higher poverty for women.

There are plenty of health risks related with not enough water, sanitation and hygiene knowledge and practices. Over eight hundred thousand kids under the age of 5 years die every year due to diarrhea. 88 percent of these death cases with diarrhea are happened due to contaminated water, lack of sanitation and lack of proper hygiene practices.

Other common waterborne diseases include Cholera, Typhoid and Dysentery. In poor countries lot of people's time in these areas are spent struggling to get clean water and avoid sanitation challenges in the first place. And the hours not turning around these troubles would probably be decreased quality of life because of the many minor health concerns related with inadequate water quality. Eventually, lacking proper water, sanitation and hygiene leads to lessened quality of people's life all the time (Global Citizen Report 2017).

### **2.2.2 Water, Sanitation and Hygiene effect on Health**

Water supply, sanitation, and health: these three factors are closely related. Lack of proper hygiene practices, inadequate quantities and quality of safe drinking water, and poor sanitation facilities produce masses of the world's neediest people to die from preventable diseases every year. Women, young children, and infants are the main victims.

Water, sanitation and health are linked in many ways: contaminated water that is consumed may consequence in waterborne diseases including viral hepatitis, typhoid, dysentery, cholera, and other diseases that cause diarrhea, without acceptable quantities of water for personal hygiene, skin and eye infections spread easily and water-based diseases and water-related vector borne diseases can result from water supply projects that unintentionally provide habitats for mosquitoes and snails that are intermediate hosts of parasites that cause schistosomiasis, lymphatic filariasis, malaria,

onchocerciasis and Japanese encephalitis and drinking water supplies that comprise high amounts of certain chemicals (like arsenic and nitrates) can cause serious sickness. Insufficient water, sanitation, and hygiene account for a huge part of the problem of illness and death in developing countries:

Around 4 billion cases of diarrhea per year bring about 2.2 million deaths, most- 1.7 million under the age of 5 years children, about 15 percent of all under 5 mortalities in developing countries.

Diarrheal diseases account for 4.3 percent of the total global disease problem (62.5 million DALYs). An estimated 88 percent of this burden is contributed to unsafe drinking water supply, poor sanitation, and lack of proper hygiene. These risk factors are second, after malnourishment, in attribute to the global burden of disease.

Abdominal worms infect about 10 percent of the population of the developing world, and can lead to malnutrition, anemia, and hindered growth. 6 million people are blind from trachoma and the population in danger is about 500 million, 300 million people suffer from malaria, 200 million people are infested with schistosomiasis, 20 million of whom be diagnosed with serious consequences.

Saved time, especially for women and children, is a most important benefit. Beneficiaries of water and sanitation schemes in India described these benefits: fewer tension/conflict in homes and communities; community harmony, self-esteem, women's equality (less harassment) and enhanced school attendance.

### **2.2.3 WASH and Education**

Access to safe water and basic sanitation facilities, as well as decent hygiene practices, perform an important role in education.

Many children, mainly young girls spend hours every day accumulating water and miss out on the chance to attend school. According to global figures, women and young children spend approximately 200 million hours every day for collecting water. But the issue is not just lack of availability of safe water; lack of access to basic sanitation facilities, and gender segregated latrines, in schools cause a variety of issues. Adolescent girls are particularly concerned by this, as they need a clean and private space to be able to manage their menstrual hygiene with privacy and dignity.

WASH impacts more than the ability of children to attend school as many children experience physical and mental damage from water- and sanitation-related diseases that impact their performance at school and their overall educational

attainment. The consequences of poor sanitation and hygiene conditions expands beyond health and education and impacts on the economy through health expenses and labor division.

If we were able to offer basic, low-priced water and sanitation facilities to countries in need, the world would save about US\$263 billion a year. If everyone in the world had gain access to, the reduction in diarrhea-related disease alone would save \$11.6 billion in health care costs and would make \$5.6 billion in labor spending.

#### **2.2.4 Sustainable Development Goal 6 (SDG)**

In September 2015, world leaders gathered at the United Nations and created a commitment to achieve seventeen Sustainable Development Goals over the next 15 years. Jointly, these goals target to end poverty, fight inequality, and protect our natural environment.

Goal 6 of the Sustainable Development Goals (SDGs) targets to “ensure availability and sustainable management of water and sanitation for all”. UNICEF works within the framework of the new development agenda to assist governments in achieving these goals. While all goals on this agenda are incorporated and support one another, access to water and sanitation is a foundation for development with respect to health, equity, gender equality and education. While significant progress has been made in improving access to clean drinking water and sanitation, billions of people primarily in rural areas still lack these basic services. Global, one in three people do not have access to safe drinking water, forty percent people do not have a basic handwashing facility with soap and water, and greater than 673 million people still practice open defecation.

The COVID-19 pandemic has revealed the critical importance of sanitation, hygiene, and adequate gain access to clean water for preventing and containing diseases. Hand hygiene saves lives. According to the WHO, handwashing is one of the most efficient actions you can take to reduce the spread of pathogens and prevent infections, including the COVID-19 virus. But still billions of people still lack clean water sanitation, and funding is inadequate.



**Table (2.1) The Targets of the Sustainable Development Goal 6**

No.	Goal No.	Description
1	6.1	By 2030, achieve universal and equitable access to safe and affordable drinking water for all
2	6.2	By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
3	6.3	By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally
4	6.4	By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity
5	6.5	By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate
6	6.6	By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers, and lakes
7	6.A	By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling, and reuse technologies
8	6.B	Support and strengthen the participation of local communities in improving water and sanitation management

Source: UN Environment Program 2021

Corresponding to WASH in Health Care Facilities Worldwide baseline report, 1 in 4 health care facilities needs basic water services. 3 in 10 people absence access to safely managed drinking water services and 6 in 10 people lack gain access to proper managed sanitation facilities, at least 892 million people remain to practice open defecation. Women and girls are accountable for water collection in 80 per cent of households without access to clean water on premises. Between 1990 and 2015, the

ratio of the global population using an upgraded drinking water source has expanded from 76 per cent to 90 per cent. Water scarcity impacts more than 40 per cent of the global population and is estimated to rise. Over 1.7 billion people are presently living in river basins where water use goes over recharge. 2.4 billion population lack of access to proper simple sanitation services, such as toilets or latrines. Over 80 per cent of wastewater causing from human activities is emitted into rivers or sea without any pollution removal. Every day almost 1,000 children die due to preventable water and sanitation linked diarrheal diseases. Roughly 70 per cent of all water condensed from rivers, lakes and aquifers is applied for irrigation. Floods and other water-related disasters account for 70 per cent of all deaths associated to natural disasters.

### **2.3 Access to Water (WASH) in Least Developed Countries (LDCs)**

Water is essential for the survival and development of all living things. Without water, human being simply cannot stay alive or thrive in a healthy environment. Water resources, and the variety of services they provide, strengthen poverty reduction, economic growth, and environmental sustainability. Over 97 percent of the ground's water is found in the oceans as salt water. Two percent of the earth's water is collected as fresh water in glaciers, ice caps, and snowy mountain scales. That puts only one percent of the earth's water available to us for our daily water supply needs. Our fresh water supplies are stored either in the soil (aquifers) or core fractures beneath the ground (ground water) or in lakes, rivers, and streams on the earth's surface (surface water). There is the same amount of freshwater on earth as there all the time has been, but the population has exploded, leaving the world's water resources in crisis. Wherever they are, people require water to survive. Not only is the human body 60 percent water, but the resource is also vital for producing food, clothing, and computers, moving our waste stream, and keeping us and the environment healthy.

Water is sustainable development and the eradication of poverty and hunger, and is indispensable for human development, health, and wellbeing. Water-related challenges, including limited access to clean water and sanitation, increasing pressure on water resources and ecosystems, disasters and an exacerbated risk of droughts and floods, have received increasing attention in the global development arena. United Nations Secretary General's Plan: Water Action Decade 2018-2028 (Assembly, 2016) Hygiene refers to acts that can lead to better health and cleanliness, such as frequent handwashing, face washing, and showering with soap and water. Keep hands clean is

one of the most important ways to prevent the spread of infection and illness. However, in many areas of the world, practicing personal hygiene is difficult according to poor resources such as clean water and soap. Many diseases (including diarrheal diseases) can be spread when hands, face, and physical body are not washed appropriately at the key times.

Most diarrheal diseases are spread by person-to-person contact or by fecal-oral routes, many times by way of polluted hands. Handwashing can prevent the spread of many diarrheal disease-causing germs, such as typhoid and cholera, by removing bacteria, parasites, and viruses from the hands. Handwashing is essential to disease prevention in all parts of the world; however, access to soap and water is limited in several smaller income countries. This poor access is one of several challenges to proper hygiene in lower income countries. Efficient handwashing interventions involve education and promoting continuing behavior changes, both in appropriate social and cultural contexts.

### **2.3.1 Hygiene Challenges and Resources in Least Developed Countries (LDCs)**

Various challenges and barriers to good hygiene exist in lower income countries. The best of these challenges is the shortage of clean water. Hundreds of millions of people do not have access to improved sources of drinking water, there are 1.6 million deaths per year attributed to diseases spread through bad water, poor sanitation, and lack of hygiene.

Under circumstances where clean water is not available, evidence indicates that hygiene practices (for example, washing hands) using bad water are beneficial to reducing the spread of disease and are better than not washing at all. While access to safe water is poor, the centers for disease control and prevention (CDC) recommends using bad water in the same manner as safe water for hygiene practices, to keep clean hands before eating, after using the toilet, and at another key times.

In addition to water, another hygiene challenge in lower income countries is access to get the soap. Even when getting soap is available, it is typically used for laundry and bathing instead of for handwashing.

## **2.4 Access to Water Accessibility**

Access to good drinking water is a basic human right and an essential foundation of public health. The SDGs set new targets for drinking water, sanitation, and hygiene (WASH). Target under Goal 6 call out for widespread access to safe drinking water for all by 2030. This target is determined using a new global indicator, defined as: Indicator 6.1.1: Proportion of population utilizing safely managed drinking water services. Populations use safely managed drinking water facilities when the main source of drinking water is an improved source.

Over the past various decades, ever-growing demands for and misuse of water resources have increased the risks of pollution and water stress in many parts of the world. The frequency and strength of local water crises have been increasing, with serious implications for public health, environmental sustainability, food and energy security, and economic development. Demographics remain changing and unsustainable economic practices are affecting the quantity and quality of the water at our removal, making water an increasingly scarce and costly resource especially for the poor, the marginalized and the vulnerable. (Sustainable Development Goals Knowledge Platform (Nations, 2015))

In 1990, worldwide coverage of the use of improved drinking water sources and sanitation facilities stood at 76 per cent and 54 per cent, with respective MDG targets of 88 percent and 77 per cent by 2015. The challenges were big, as the global figures hid vast disparities in coverage between countries, many of which were struggling poverty, instability, and rapid population growth. (WHO, UNICEF, 2015)

In 2000 the Millennium Development Declaration entitled for the world to halve by 2015 the proportion of people without access to safe drinking water as well as the proportion of people who do not have access to elementary sanitation and in 2003 the International Year of good water was declared by the General Assembly, followed by the "Water for Life" Decade from 2005 to 2015. (Nations, 2015)

Between 2000 – 2017, the population using safely managed services increased from 61 percent to 71 percent. Safely accomplished services increased in all SDG regions with estimates available. From 25 percent to 35 percent in Least Developed Countries. The coverage of safely managed services increased from 39 percent to 53 percent the gap between urban and rural areas decreased from 47 to 32 percent. 1.8 billion people got access to at least basic services. The population requiring basic services decreased from 1.1 billion to 785 million and the number of people collecting

water directly from surface water sources reduced from 256 to 144 million. 20 out of 86 states with disaggregated data succeeded in reducing the gap in basic service coverage between the richest and poorest wealth quintiles. (WHO, UNICEF, 2017)

In 2017, 117 countries (and four out of eight SDG regions) had estimates for safely managed services, representing 38 percent of the global population. 5.3 billion people used safely managed services. 1.4 billion used at least basic services. 206 million people utilized limited services, 435 million utilized unimproved sources, and 144 million still used surface water. Eight out of ten people still not have even basic services lived in rural areas. Almost half lived in Least Developed Countries. In 24 out of 90 countries with disaggregated data, basic water coverage amongst the richest wealth quintile was at least twice as high as coverage among the poorest quintiles. 80 countries had 99 percent basic water coverage. One in three countries with 99 percent were on path to achieve ‘nearly universal’ coverage by 2030. (WHO, UNICEF, 2017)

Water supply in Myanmar has been accorded high priority in the cities only. The basic level of service in the rural areas in the open pond, filled by rainwater in the wet season and used for a good part of the dry. Water is generally available but become very scarce the dry season especially in the middle part of Myanmar. The quality of rural water is generally poor, but immunity level is naturally high that provide limited define against epidemics of typhoid and cholera when they occurs. Ponds, rivers, and shallow tube wells are easily contaminated and need to be protected. Throughout Myanmar, natural surface water is preferred for drinking and cooking purposes except where it is saline. In fact, in many towns with tube well water available, families will specifically search out (and even purchase) river and pond water for drinking and cooking. It is frequently claimed that such water is boiled before drinking.

It is common for several international organizations to use access to safe drinking water and hygienic sanitation facilities as a measure in the fight against poverty, disease, and death. It is also deemed to be a human right, not a privilege, for every man, woman, and child to have access to these services. Even though improvement has been done in the last period to provide safe drinking water and sanitation to people throughout the world, there are still billions of people that lack access to these services every day.

Due to the World Health Organization and UNICEF, in 2015, 91 percent of the world’s population used drinking water from improved sources (58 percent from a piped connection in their dwelling, plot or yard, and 33 percent from other improved

drinking water sources), leaving 663 million people lacking access to an improved source of water.

The world touched the United Nations' Millennium Development Goal (MDG) drinking water target to reduce the proportion of people without sustainable access to safe drinking water by 2015 in 2010, 5 years ahead of plan. Over 2 billion people got access to improved water sources from 1990 to 2010. Though, several people remain without access to improved drinking water.

Access to safe drinking water is determined by the percentage of the population having access to and using better drinking water sources. Access to safe drinking water is determined by the percentage of the population having access to and using improved drinking water sources. Improved drinking water sources would, but do not always, provide safe drinking water, and include Piped household water connection, public standpipe, Borehole Protected dug well, Protected spring, Rainwater collection

Unimproved drinking water sources consist of Unprotected dug well, Unprotected spring, Surface water (river, dam, lake, pond, stream, canal, irrigation channel), Vendor-supplied water (cart with small tank/drum, tanker truck), Bottled water, Tanker truck water. Bottled water is not considered better due to limitations in the potential quantity, not quality, of the water.

## **2.5 Sanitation Facilities**

According to the World Health Organization and UNICEF, in 2015, only 68 percent of the world's population used improved sanitation facilities, with Sub-Saharan Africa and Southern Asia having only 30 percent and 47 percent, respectively. About 13 percent of the world's population lives without ANY FORM of sanitation and practice open defecation. Access to sanitation is determined by the percentage of the population with access and using improved sanitation facilities. Improved sanitation facilities usually ensure separation of human excreta from human contact and include Flush or pour-flush toilet/latrine to: Piped sewer system, Septic tank, Pit latrine, Ventilated improved pit latrines, Pit latrine with slab and composting toilet.

Shared facilities include public toilets. Poor sanitation facilities do not ensure hygienic separation of human excreta from human contact and include Pit latrine without a slab or platform, Hanging latrine, Bucket.

### **2.5.1 The Importance of Sanitation**

The widely practiced open defecation and unsafe disposal of excreta due to lack of latrines significantly indicated a high risk of disease spread in the rural communities. Poor access to sanitation services, set without proper hygiene practices, impends to death and causes huge amount of children sickness every day, and leads to reduce and diminish opportunities for thousands more.

The world is alarmingly off-track to provide sanitation for all by 2030. Despite progress, over half of the world's population, 4.2 billion persons, use sanitation services that leave human waste untreated, threatening person and environmental health. An estimated 673 million people have no latrines at all and practice open defecation, while nearly 698 million school-age kids lacked basic sanitation services at their school. The consequences of poor sanitation are damaging to public health and social and economic development. Along with only 10 years gone until 2030, the rate at which sanitation coverage is increasing will need to multiply if the world is to achieve the SDG sanitation targets. The challenge is significant, past shows that rapid progress is possible. To accelerate progress, sanitation must be described as an essential public good one that is foundational for a healthy population and wealthy society. (UNICEF and WHO, 2020)

Sanitation is a human right. Everybody is entitled to sanitation facilities that provide privacy, ensure self-esteem and safety, and that are physically. The lack of safe sanitation leads to illness and disease that disproportionately impact children, including diarrhea, worm infections and stunting. But inadequate sanitation affects everyone, and a polluted environment impacts the entire community, whether an individual household has a sanitation facility. In supplement to hard-to-quantify impacts on dignity, safety and gender equality, there are substantial financial costs related to need of sanitation, including increased health care costs, missing income, forgone educational opportunities and costs resulting from pollution. Bad sanitation disproportionately affects the most vulnerable and disadvantaged, particularly females and people living with disabilities. (UNICEF and WHO, 2020)

Good sanitation is also a human right necessary for the fulfilment of child rights and the achievement of good physical, mental and public well-being recognized as a separate right by General Assembly of the United Nations (2015). In the same year, States committed to the 2030 Schedule for Sustainable Development, containing target 6.2 of the SDGs: "By 2030, achieve access to adequate and reasonable sanitation. Progress towards universal sanitation is alarmingly off track, and uneven in its

coverage, resulting in inequalities and the further marginalization of the most vulnerable. With only 10 years left before 2030, the rate at which sanitation coverage is increasing will need to quadruple to achieve SDG target 6.2. At the present rate of progress, it will be the twenty-second century before sanitation for all is a reality. This is very slow. (UNICEF and WHO, 2020)

Sanitation suffers from under prioritization, lack of leadership, underinvestment, and a shortage of capacity. As most countries have national policies and plans to support sanitation, few have given adequate person and financial resources to implement them. The COVID-19 pandemic has intensified many sanitation challenges. People isolated at home, where they carry out unsafe sanitation facilities or are forced by their lack of sanitation facilities into unsafe, common areas, such as poorly managed public toilets or open defecation places. The pandemic has supported what the evidence makes clear: poor sanitation puts everyone at risk. (UNICEF and WHO, 2020)

### **2.5.2 Open Defecation Practices**

Open defecation is while people go out in fields, forests, open areas of water, or other open spaces rather than utilizing a toilet. It is incredibly hazardous, as contact with human waste can cause diseases for example cholera, typhoid, hepatitis, polio, diarrhea, worm infestation and under nutrition. Daily, more than 800 children under five dies from diarrhea-related diseases. (Unicef, Water Sanitation and Hygiene (WASH), 2017)

Worldwide, India has the largest number of people still defecating in the open: over 564 million. (Unicef, United Nations Children's Fund (UNICEF), 2017)

Though the global average reduction in open defecation appears to be on track to eliminate the practice, much of the progress in eliminating open defecation is being driven by gains in a few high population countries. This means that open defecation remains a persistent inequality, with nine out of ten open defecators living in rural areas, and poorer people much more likely to practice open defecation. The perception of 'open defecation free' populations is an important one. In these communities every member of every household uses hygienic sanitation facilities all the time, thus maintaining an uncontaminated environment for all. Many research has shown that this is important to realize the health benefits of sanitation, since even a small number of households practicing open defecation can compromise the health of the whole community. Safe disposal of feces by one household prevents disease transmission to



all households nearby and can also protect soil, water, and food. (UNICEF and WHO, 2020)

Amongst the world's people who practice open defecation, over two-thirds (558 million) live in the rural areas of South Asia. With continuous efforts, the proportion of people practicing open defecation in South Asia dropped from 65 percent in 1990 to 34 percent in 2018. (Unicef, PROGRESS REPORT, 2017)

People practicing open defecation (percent of population) in Myanmar was reported at 9.4218 percent in 2017, according to the World Bank collection of development indicators, compiled from officially recognized sources. Myanmar - People practicing open defecation (percent of population) - actual values, historical data, forecasts and projections were sourced from the World Bank on January of 2021.

Open defecation pollutes sources of drinking water and disperses diseases such as cholera, diarrhea, and dysentery. The World Health Organization estimations that inadequate sanitation affects 432,000 diarrheal deaths annually. The diarrhea increases the risk of malnutrition among children. Open defecation also destroys human dignity and safety. (Unicef, PROGRESS REPORT, 2017)

## **2.6 Health Knowledge and Hygiene Practices**

The hygiene is the practice of keeping oneself and one's surroundings clean, especially to prevent illness or the spread of diseases. Hygiene practices are essential to one's health and well-being especially in the avoidance of the communicable diseases. (Getachew Dagnew Gebreeyessus, Dessalew Berihun Adem, 2018).

Today, 2.2 billion people poor access to safely controlled drinking water services and 4.2 billion people lack safely controlled sanitation services. Unsafe hygiene practices are widespread, compounding the impacts on people's health. The impact on child death rates is devastating with more than 297 000 children under five who die annually from diarrheal diseases due to poor sanitation, bad hygiene, or unsafe drinking water. (unwater.org water-facts water-sanitation-and-hygiene (Water, 2021)) Hygiene is the subject of health and its safeguarding said by Dorland, 1997. Our health as individuals depends on the health fulness of our environment. A healthy environment, devoid of risky substances allows the individual to attain complete physical, emotional, and social potential. The most successful interventions against diarrheal diseases are those that cut off the transmission's disease agents at home.

### **2.6.1 Handwashing**

Handwashing prevents diarrhea effectively when done properly and at critical times (before preparing food, eating, or feeding; after defecating, cleaning a baby, or changing a diaper). Proper method includes using soap, or an effective substitute such as ash, rubbing hands together at least three times, rinsing hands in flowing water, and drying them on a clean cloth or by air. A meta-analysis of handwashing studies conducted in developing countries concluded that handwashing could reduce the risk of diarrhea in the general population by 42 percent. A recent observational study in Bangladesh found that diarrhea occurred less often in households where residents washed at least on hand after defecation and before preparing food. The study recommended that washing hands before preparing food is particularly important to prevent diarrhea in children (Luby SP, Halder AK, Huda T, Unicomb L, Johnston RB, 2011)

### **2.7 Reviews on Previous Studies**

Regarding to the study on water, sanitation and hygiene, there are many scholars and researchers conducted research in different points of view.

Aye Sandar Tun conducted a thesis of a study on knowledge, attitude and practice of hygienic behavior in Kayin State in 2019. In this thesis findings, some of the respondents seem to conceptualize the association between contaminated water and diseases. People are aware of diarrhea and dysentery disease that they are associate with dirty/unclean water and contaminated food, however, they do not seem to know much about association between poor hygiene including personal hygiene (handwashing) and diarrhea, and no one able to make association between poor environmental hygiene and diarrhea or between pathogen/germs and diarrhea. (Tun, 2019)

According to the findings, out of four cleans, it could be said that hand clean and latrine clean were not known as prevention for diarrhea by majority of the community even though food clean and some extent to water were known to them. Moreover, most respondents do not think about diarrhea is a major illness and life-threatening disease. And they considered that it is less serious than the other diseases such as dengue fever and malaria. (Tun, 2019)

Thu Rein Win (2012), written a thesis on the title of “A study on Community Awareness on sanitation and personal hygiene practice in Hlegu Township”. The study revealed that behavior change is very important for hygiene practices such as four

cleans than having awareness of water and sanitation. Then, each household will improve good hygiene practices and not need to worry of their children's education and health costs. If the hygiene practice is functioning well starting from individual level in the community, Township, Nation, Regional and Global levels will be improved of people hygiene practices. (Win, 2012)

Kyaw Htet Aung (2018) developed a thesis named "A study on awareness of waterborne diseases in Twantay Township". In the study, it was found that almost all the respondents are quite aware of two well-known waterborne diseases, diarrhea, and dysentery; however, they have poor knowledge on cholera, hepatitis A and typhoid. There he mentioned that practice plays the most important role in hygiene behaviors. There is always a gap between awareness and knowledge to practice. Hygiene and personal cleanliness awareness should also spread since young then over in quarters. (Aung, 2018)

## **CHAPTER 3**

### **WATER SUPPLY, SANITATION AND HYGIENE IN MYANMAR**

This chapter presents overview of Water, Sanitation and Hygiene in Myanmar including the water resources, utilization status of water condition, access to water supply as well as challenges and opportunities of WASH.

#### **3.1 Water Resources and Status of Utilization in Myanmar**

Myanmar is a country granted with water resources. The catchment area of Myanmar's ten main river basins includes about 737800 km<sup>2</sup>. Possible water resources capacity is about 1082 km<sup>3</sup> for surface water and 495 cubic km for groundwater.as well comprise domestic water resources annually.

As an agro-base country of Myanmar, water utilization for agricultural sector stands for 90 percent while industry and domestic use is only about 10 percent of the total water use. The total consumption of the nation's water resources is about 5 percent. The physical possibility for development of water resources in Myanmar is very significant.

Though, growth of population and increased necessary for water for economic actions, there is growing tension on usage of surface water and origin of groundwater. Monitor and managing of surface water and groundwater is essential for sustainable progress of the country in coming.

**Table (3.1) Potential Water Resources in Myanmar**

<b>Sr.</b>	<b>River Basin</b>	<b>Catchment Area (km<sup>2</sup>)</b>	<b>Inflow(km<sup>3</sup>)</b>
1	Chiundwin	115300	57.58
2	Ayeyarwady (Upper)	193300	92.60
3	Ayeyarwady(lower)	95600	153.25
4	Sittoung	48100	28.40
5	Rivers in Rakhaing State	58300	41.77
6	River in Thanintharyi Division	40600	39.28
7	Thanlwin ( in Myanmar)	158000	74.78
8	Mekong (in Myanmar)	28600	7.05
<b>Total</b>		<b>737800</b>	<b>494.71</b>

Source: National Water Resources Management in Myanmar 2021

**Table (3.2) Potential Groundwater in Myanmar**

<b>Sr.</b>	<b>River Basin</b>	<b>Catchment Area (km<sup>2</sup>)</b>	<b>Inflow (km<sup>3</sup>)</b>
1	Chiundwin	115300	141.29
2	Ayeyarwady (Upper)	193300	227.92
3	Ayeyarwady(lower)	95600	85.80
4	Sittoung	34400	41.95
5	Rivers in Rakhaing State	58300	139.25
6	River in Thanintharyi Division	40600	130.93
7	Thanlwin (in Myanmar)	158000	257.92
8	Mekong (in Myanmar)	28600	17.63
9	Bilin River and other rivulets	8400	31.17
10	Bago River	5300	8.02
<b>Total</b>		<b>737800</b>	<b>1081.88</b>

Source: National Water Resources Management in Myanmar 2021

### 3.1.1 The Present Status of Water Situation

The percentage of people cover by safe drinking water (including sanitation facilities) are still very low in the country compared to the global status. In Myanmar countryside water supply activities have being started in 1952 to deliver good drinking water and apply environmental sanitation set up for the rural population. At this time, with the support of international organizations, various water supply and sanitation projects are implementing. The end of August 1995 Government applied, several rural water supply activities cover up for 12.5 million of the people.

Nearly all of the irrigation reservoirs have being placed on the rivers and streamlets of main water resources. Thus, while not obstructing or hindering the flow of primary water resources, the effect of the dams on environment have also been insignificant. Likewise, no key reservoirs that could hinder flow have been constructed in the catchment of the Ayeyarwady river, which is Myanmar's major water channel.

Utilization of storage water from tank is not only for the irrigation but also for drinking intent.

**Table (3.3) Access to Water Supply in Myanmar**

State/Region	Population	Households	Improved*	Unimproved	Percent Improved
Kachin	864,241	173,506	115,316	58,190	66.5
Kayah	204,497	42,606	20,243	22,363	47.5
Kayin	1,153,266	240,874	132,214	109,416	54.7
Chin	368,381	71,351	47,323	24,028	66.3
Sagaing	4,220,866	913,085	724,381	188,704	79.3
Tanintharyi	1,033,901	216,292	112,666	103,626	52.1
Bago	3,735,488	903,960	640,906	263,054	70.9
Magway	3,241,904	788,526	589,847	198,679	74.8
Mandalay	3,904,767	907,558	733,503	174,055	80.8
Mon	1,415,429	308,425	188,175	120,250	61.0
Rakhine	1,706,388	387,148	127,758	259,390	33.0
Yangon	2,133,384	513,888	219,765	294,123	42.8
Shan	4,218,058	889,651	364,345	525,306	41.0
Ayeyawady	5,234,055	1,288,021	600,938	687,083	46.7
NayPyiTaw	768,584	183509	141,417	42,092	77.1
Union	34,203,208	7,828,400	4,782,377	3,107,961	60.6

Source: National Water Resources Management in Myanmar 2021

Improved water supplies include piped water with household connections or tap-stands, tube wells with motorized or hand-pumps, and protected wells and springs.

### **3.1.2 Challenges and Opportunities**

Myanmar's water resources look like abundant, in many parts they are already to some extent problematic. Such challenges may vary according to regional differences. Regional differences are however significant, e.g., possibly over 90 percent of available water is being used in the central dry zone (FAO 2011), where water used for hydropower can be re-used downstream. Though, Myanmar's valuable water resources also offer opportunities for further economic development that serves the population and is, at the same time, environmentally sustainable. This report distinguishes between the mountain area, the dry zone, the coastal zone, the Ayeyarwady delta, rivers, reservoirs and lakes, and towns. The following challenges and prospects are described according to regional differences. (Water Environment Partnership in Asia)

### **3.1.3 Drinking Water Situation in Myanmar**

Due to WHO guidelines, and sanitation is a national priority. This the greatest challenge for all regions, with no exception, although there are regional differences. In the future, more drinking water supply needs to be based on piped water systems. Presently rainwater harvesting and deep tube wells are the major sources for drinking water, even in urban areas. The transition for solid waste collection from individual to collective responsibility is an important challenge, as is sewage water treatment. In some urban areas water is being priced, but overall, in Myanmar hardly. Water pricing to fund safe water supply and sanitation, stimulate water savings should be considered seriously. Higher quality of the water supply system will also decrease the non-revenue share.

### **3.1.4 Water Resource Management**

Water demands to be assumed importance in the next order and will be based on economic, social, and environmental standards of the water factors: (a) Drinking Water, domestic usage, water for persons (b) Water for Urban and Rural Sanitation (c) Water for Food security (d) Water for other uses (industries, hydropower, beautifications, firefighting, etc.) There is a need to map and monitor the country's

water resources to know the total available quantity and quality of surface and groundwater resources (replenishable as well as non-replenishable) in the country. The mapping should be periodically updated.

### **3.2 Rural Sanitation and Hygiene in Myanmar**

74 percent access to improved sanitation in rural areas, with open defecation at just 8 percent. There are wide variations in access between villages, townships, and regions. The pan is not water sealed and therefore not hygienic as it puts no barrier between faces and flies, though some users place a cover over the pan when not in use. The sustainability of many of the facilities in place is a key concern: field visits revealed that householders would prefer durable toilets but cannot generally afford them. A UNICEF study in 2011 found that 89.1 percent of adults reported washing their hands after defecating, but only 69.3 percent washed their hands with water and soap.

Operational responsibility for sanitation and hygiene promotion lies with midwives and public health supervisors in rural health centers. A PHS2 recruitment drive is underway. In the past, government and support agencies provide hardware subsidies for household latrines but the practice is in decline, though no policy decision has been made.

Key challenges for sanitation promotion at community level include changing user behavior where communities are unaccustomed to using a toilet: dealing with full pits: the affordability of improved designs.

Sanitation is not actively encouraged by political and community leaders or the media. A state sanitation movement established on community led total sanitation (CLTS) has been applied but does not yet carry on a national level, and extremely few states/regions have sanitation projects.

A growing several local and international NGOs are involved in CLTS but there is so far no common strategy and participating organizations show a limited understanding of the approach. Low reported rates of defecation prompt the question as to whether CLTS offers the best promotional approach for Myanmar. (WASH sitan Final) JMP reports)



**Table (3.4) Household Access to Sanitation in Myanmar**

<b>State/ Region</b>	<b>Population</b>	<b>Households</b>	<b>Improved*</b>	<b>Unimproved</b>	<b>No toilet</b>	<b>percent Improved</b>
Kachin	864,241	173,506	142,438	26,163	4,905	82.1
Kayah	204,497	42,606	36,855	2,033	3,718	86.5
Kayin	1,153,266	240,874	148,797	18,847	73,230	61.8
Chin	368,381	71,351	49,535	8,010	13,806	69.4
Sagaing	4,220,866	913,085	618,703	123,055	171,327	67.8
Tanintharyi	1,033,901	216,292	128,681	45,055	42,556	59.5
Bago	3,735,488	903,960	638,702	149,294	115,964	70.7
Magway	3,241,904	788,526	519,623	113,199	155,704	65.9
Mandalay	3,904,767	907,558	670,647	43,550	193,361	73.9
Mon	1,415,429	308,425	226,818	17,731	63,876	73.5
Rakhine	1,706,388	387,148	91,237	20,434	275,477	23.6
Yangon	2,133,384	513,888	422,246	51,246	40,396	82.2
Shan	4,218,058	889,651	488,048	273,821	127,782	54.9
Ayeyawady	5,234,055	1,288,021	932,737	170,978	184,306	72.4
NayPyiTaw	768,584	183,509	154,012	10,804	18,693	83.9
Union	34,203,208	7,828,400	5,269,079	1,074,220	1,485,101	67.3

Source: National Water Resources Management in Myanmar 2021

Improved sanitation is flush toilets and water seal (improved pit) toilets

### **3.2.1 Increasing Access to Household Sanitation and Eliminating open Defecation**

According to the 2014 Census, the rural population of Myanmar has relatively high coverage with sanitation compared to other countries in the region. Open defecation, nevertheless, continues a significant challenge in many rural areas. There is a lack of resilience in the infrastructure for household latrines to hazards such as flooding. The availability of suitable, affordable technical designs for difficult areas such as flood prone areas, high groundwater areas, and vulnerable area such as riverbanks is a challenge. International practice has shown that traditional approaches to enhancing sanitation, which are aimed at building facilities, have not resulted in significant and sustained sanitation coverage. More promising strategies are now focused on creating demand for improved sanitation by changing behaviors while

strengthening the availability of supporting products and services. Latrines are consumer products; their design and promotion should follow good marketing principles – including a range of options and designs attractive to consumers and therefore based on consumer preferences, affordability, and suitability for local environmental conditions.<sup>38</sup> Household access to latrines alone is not sufficient for safe management of excreta. Human excreta can only be safely managed when it is safely treated in situ or transported to a designated disposal/ treatment site before being re-used or returned to the environment. Sanitation should be considered as a system, in which the latrine is only one part. To make the best use of the limited public funding available for sanitation to bring about the biggest change, approaches to sanitation will focus on the creation of conditions for people and households to want toilets and to be able to obtain these for themselves. This will include services to maintain these in the long term, such as emptying of latrine pits and desludging septic tanks.

### **3.2.2 All the Rural Populace will Practice Basic Safe Hygiene Behavior**

Recent Knowledge, attitude and practice have shown that although knowledge of safe hygiene is high, actual practice of safe hygiene behavior is low. Understanding the reason for this gap between knowledge and practice, and then using that understanding to improve approaches to hygiene promotion, is key to getting change in behavior. It is now generally accepted that the number of risk behaviors to address should be limited. Therefore, the key risk behaviors that will be addressed through hygiene promotion: Open defecation, Not washing handset critical times and not using soap, Drinking unsafe water, Unsafe disposal of infants' feces.

A Communication for Development (C4D) approach has been adopted by the Environmental Health Bureau using the “Four Cleans” booklets (clean hands, clean food, clean water, clean latrines) as the guidance for hygiene promotion. NGOs use their own approaches and materials. EHB addresses menstrual hygiene management as part of reproductive health care, with funding from other sources.

**Table (3.5) Key Issue and Challenges of Water, Sanitation and Hygiene in Myanmar**

Subject	Issues and Challenges
Policy and Strategy	<ul style="list-style-type: none"> <li>- Absence of sector policy and strategy</li> <li>- Targets unspecified or unclear (no target date for sanitation)</li> <li>- No framework for government and donor investment</li> <li>- Equity and inclusion marginalized in resource allocation Sector is unregulated</li> <li>- No quality standards for water supply or wastewater treatment</li> <li>- No performance requirements for service providers (public or private) Sector monitoring weak and limited in scope</li> <li>- Lack of reliable information on coverage, use, functionality, sustainability</li> <li>- Planning and decision making not informed by data</li> <li>- Focus on projects, not sector goals (no annual sector reviews)</li> </ul>
Institutional Arrangements	<ul style="list-style-type: none"> <li>- Two ministries share rural WASH</li> <li>- Limited DOH-DRD co-ordination at national and sub-national level</li> <li>- Limited knowledge of best practices (operational approaches, technology options)</li> </ul>
Sector Finance	<ul style="list-style-type: none"> <li>- Inadequate investment in non-emergency WASH</li> <li>- WASH-related expenditure difficult to track (government and donors)</li> </ul>
External Support	<ul style="list-style-type: none"> <li>- No dedicated structure for government–development partner co-ordination in WASH</li> <li>- No government WASH programmes providing a framework for donor support</li> </ul>
Rural Water Supply	<ul style="list-style-type: none"> <li>- Inadequate maintenance, though functionality status not known (not monitored) Ambitious DRD short term targets may be unrealistic (funding, personnel)</li> <li>- Some hardware choices not durable, minimum standards not always followed</li> </ul>

**Table (3.5) Key Issue and Challenges of Water, Sanitation and Hygiene in Myanmar (Continued)**

Subject	Issues and Challenges
Rural sanitation and hygiene	<ul style="list-style-type: none"> <li>- CLTS not evaluated (suitability for Myanmar not confirmed, no lessons learned)</li> <li>- Household toilets unaffordable for many, especially in flood-prone areas and other challenging environments</li> <li>- Inconsistent provision of hardware subsidies by government, donors, NGOs Lack of technology choice in projects (one model promoted)</li> <li>- Handwashing with soap not prioritized in projects, high incidence of diarrhea</li> <li>- Sanitation promotion based on educational approach, not behavior change</li> </ul>
School WASH	<ul style="list-style-type: none"> <li>- Complexities under-estimated (facility design, hygiene promotion) Insufficient information on status, especially secondary school facilities</li> <li>- functionality of facilities (not monitored by EMIS) -Low investment by government and donors</li> <li>- Inadequate water supply: obstacle to hygiene and burden on children collecting Pupil: toilet ratio remains high by international comparison</li> <li>- Handwashing not prioritized Inadequate school maintenance budgets No WASH focal person in schools</li> <li>- Teachers need more Life Skills training</li> </ul>
Emergency WASH	<ul style="list-style-type: none"> <li>- Facilities failing after 3 years (not durable) RRD coordinates but no implementing role</li> <li>- Transition pathway needed from emergency WASH to development (community and institutional level)</li> <li>- Financial planning difficult due to inadequate data on affected persons</li> </ul>

Source: National strategy for rural water supply sanitation hygiene WASH (2016-2030)

### **3.3 Health Situation in Shan State**

Important reductions in motherly and child mortality can be achieved through a few simple health interventions, including giving birth in a health facility (or at least in the presence of a skilled birth attendant), timely immunization against some of the main childhood illnesses, and adequate management of diarrhea including oral rehydration therapy (ORT) etc.

A low proportion of children born in Shan State are likely to be born in a health facility where life-saving obstetric care would be available for mother and child in case of complications during birth. According to available data, the proportion of births in a health facility range from 23 per cent in Shan South to 41 per cent in Shan East. Immunization rates appear comparable to the national average in Shan South and East but are almost 10 percent-age points lower in Shan North. The use of oral rehydration therapy (ORT), to prevent life-threatening dehydration associated with diarrhea among children, is employed in 87 per cent of the cases in Shan South and only 28 per cent of the cases in Shan North.

Basic Information of Health, Water and Sanitation in Northern Shan State: Northern Shan State in the north of Myanmar, has a history of conflict between Government armed forces (Tat Ma Daw) and ethnic insurgency/ independence movements (Shan State Army (SSA), Myanmar National Democratic Alliance Army (MNDAA) and Ta'ang National Liberation Army (TNLA) and the Arakan National Army (ANA)), some dating back to independence and beyond. At the root cause of the conflict is territorial control, identity, and control over natural resources. Decades of conflict resulted in suffering, death, displacement of people, loss in livelihoods and destroyed infrastructure.

Therefore, northern Shan state exhibits all characteristics of a fragile state and a protracted crisis: Basic needs coverage is mostly not guaranteed, basic infrastructure and services either poorly exist or don't exist at all and civil society is considered vulnerable and poor.

The national ceasefire agreement (NCA), signed in October 2015 including some of the EAG operating in Northern Shan State offers' a unique opportunity to promote reconstruction and development of the region in the long term. But armed conflict and displacement often temporary are still ongoing between EAG's and the Myanmar army leaving affected communities still without support in their basic needs and development opportunities.

Poverty in northern Shan State with 37,4 per cent of the population living below the poverty line is high compared to the national average of 25,6 percent according to the 2010 Household Living Condition Survey.

Livelihoods in the target area are characterized by seasonal casual employment and farming often leaving the younger generation with lack of prospects facing unemployment due to lack of skills and skill developing opportunities as off farm skills training availabilities are limited to non-existent. The lack and loss of livelihoods feeds and exacerbates broader social problems, specifically drug abuse, domestic violence, human trafficking, economic migration mainly to China. In addition, males in particular become vulnerable to forced recruitment in armed forces. The need for vocational training, non-formal education, especially to young people has been stressed by the recent elected new government.

For many of the target communities' water supply especially in dry season and sanitation facilities as well as the knowledge on proper hygiene practices are limited. Many households and schools have limited to no access to latrines, open defecation is still a common problem. (Shan 2017-2020\_MHDO)

### **3.4 Access to Water in Lashio**

According to the Multiple Indicator Cluster Survey (MICS), the proportion of households not using improved water sources in Shan ranges from 1 per cent in Shan East to 11 per cent and 19 per cent respectively in Shan South and Shan North. However, the Survey on Water and Sanitation conducted in 2011 in 24 townships nationwide, including 4 from Shan State, suggests that the situation might be much worse in some areas. According to that survey, as many as 35 per cent of households in Kutkai township (Shan North) are not using improved water sources and 37 per cent in Pinlaung township (Shan South) are not.

Lack of access to safe drinking water is a major contributor to diarrhea prevalence, with 80 percent of child deaths due to diarrheal disease being at-tribute to poor drinking water, lack of sanitation and poor hygiene. Like the trend observed in Myanmar as a whole, diarrhea prevalence among children aged 0-59 months in Shan has increased slightly since 2003 (when it was 2 percent in Shan North, 3 percent in Shan East and 5 percent in Shan South).

**Table (3.6) Source of Water in Lashio**

Type of Toilet		Total	Urban	Rural
Tap water/ Piped		14.9	10	20.3
Tube well, borehole		2.4	3.3	1.4
Protected well/ Spring		32.4	42.1	21.7
Bottled water/ Water purifier		20.2	35.7	3.1
Total improved drinking water		69.9	91.1	46.5
Unprotected well/Spring		7.9	1.8	14.5
Pool/Pond/ Lake		3.8	1.0	6.9
River/stream/ canal		6.4	0.4	13.0
Waterfall/ Rainwater		8.0	0.2	16.7
Other		4.0	5.5	2.4
Total unimproved drinking water		30.1	8.9	53.5
Total	Percent	100.0	100.0	100.0
	Number	64,932	34,099	30,833

Source: National strategy for rural water supply sanitation hygiene WASH (2016-2030)

In Lashio Township, 69.9 percent of households make use of improved sources of drinking water. The proportion of households in Lashio Township is in the range of 67-99 per cent group and it is slightly higher than the Union average (69.5 percent). About 30.1 percent of the families use water from unimproved sources. In countryside areas, 53.5 per cent of the families use water from unimproved sources for drinking water.

### 3.5 Sanitation and Hygiene in Lashio

According to the Multiple Indicator Cluster Survey (MICS), the proportion of households that do not have access to improved sanitation in Shan State ranges from 8 per cent in Shan East to 32 per cent in Shan North. And open defecation rates are higher in Shan East and Shan North (3 per cent each) compared to Shan South (0.2 per cent). Water and Sanitation revealed that the situation may be much worse, especially in some areas. For example, about 52 per cent of households were not using improved latrines in Kutkai township (Shan North).

Improved sanitation be able to decrease diarrheal disease by more than a third and can significantly lessen the adverse health effects of other conditions responsible

for death and disease amongst millions of children. Investing in hygiene promotion, sanitation and water facilities is also among the most cost-effective ways of reducing child mortality.

**Table (3.7) Proportion of Households with Access to Improved Sanitation in Lashio**

Type of Toilet	Total	Urban	Rural
Flush	0.9	1.5	0.3
Water seal (Improved pit latrine)	74.9	93.3	54.5
Improved sanitation	75.8	94.8	54.8
Pit (Traditional pit latrine)	18.7	4.6	34.2
Bucket (Surface latrine)	0.8	0.2	1.4
Other	0.5	0.1	1.0
None	4.2	0.3 8.6	0.3 8.6
Total (Per cent and Number)	100.0	100.0	100.0
	64,932	34,099	30,833

Source: National strategy for rural water supply sanitation hygiene WASH (2016-2030)

Some 75.8 per cent of the households in Lashio Township have improved sanitation facilities (flush toilet (0.9 percent), water seal (improved pit latrine) (74.9 percent)). The proportion of households with improved sanitation facilities in Lashio is in the range of 66-92 percent group. The ratio of households with improved sanitation facilities in Shan State is 63.8 percent as it is 74.3 percent at the national level. About 4.2 percent of the households in the township have no toilet facilities. For the whole Shan State, it is 11.2 percent. In the rural areas of Lashio Township, 8.6 percent of the households have no latrine facilities.

### 3.5.1 Waste Management in Lashio

The most important reason for waste collection is the protection of the health of the population that gets jeopardized when the environment (water sources, nature) in which people live is contaminated by garbage and other kinds of waste. Traditional worldviews in its original meaning have teachings that focus on caring for the environment. Technology and modernization that has reached the most rural household in Myanmar has created a situation of concern for public health. The



vast amounts of inorganic waste are huge and usually villagers lack concepts for handling these materials properly. Open defecation is an additional problem where all these aspects together can mount up to a significant health problem in rural communities if not properly addressed.

### **3.5.2 Hygiene Status in Lashio**

An unhygienic environment in the house, including the kitchen as well as the toilet, and around the house. In the houses, the situation was somehow 'messy' and in around the houses and the Households, waste was scattered around the house. Garbage lays around the houses in the villages and most of the household animals were inside the house, including cats, dogs, chicken, etc. and animal feces were seen around the house. The cultural practice to have animals around the house or also inside the house is quite common and it will take some efforts to address the issue in appropriate manners. Suitable case studies might be used by the project team to address the problem and work towards hygienic household conditions. (Department of water and sanitation Myanmar2019)

## **CHAPTER 4**

### **SURVEY ANALYSIS**

The chapter presents the findings generated by descriptive statistical analysis of the survey data. The respondents' responses on questions regarding knowledge, attitude and practice are depicted with relevant tables and figures. In this chapter, WASH and health related factors of the respondents are presented with descriptive statistics such as appropriate figures and tables. To reach the study of analysis, access to water, sanitation and hygiene are main factors of Knowledge, Attitude and practice condition of communities has improved through a fair and suitable access to water, safe sanitation and hygiene knowledge in Lashio Township.

#### **4.1 Survey Profile**

This survey is conducted at the Lashio Township. The study area includes 18 villages. 357 households were nominated for interviews. The study was a cross sectional descriptive study conducted to access knowledge, attitude, and practices of the communities in Lashio. The study is using purposive sampling method for selecting villages to cover the Lashio Township's rural area at the first stage and respondents were chosen by systematic sampling at the second stage. The vacant households and household head who refuse to partake in the study will be excluded from the study. This study only focuses on the household's level knowledge and behaviors on water, sanitation and hygiene aspect. As the study was surveyed in 18 villages of Lashio Township's northern part, the survey findings cannot be represented the Southern part of Lashio Township and other townships under Shan State.

#### **4.2 Survey Design**

In this study, a descriptive analysis is used to assess the knowledge, attitude, and practice of communities in Lashio area. The total number of 357 households were interviewed from 18 villages in this survey, selected as sample and the data is collected by using structured questionnaire which include four parts. The first part contains 21

questions for general household information and socio-economic condition. The second part consists of 11 questions which focus on knowledge, attitude and practice of water related. The third part consists of 12 questions which focus on knowledge, attitude and practice of sanitation related and the final part consists of 12 questions which focus on knowledge, attitude and practice of hygiene related

The total household of in these 18 villages is 1021 HH. Number of households interviewed is 357. The percentage is 35 in total.

**Table (4.1) Number of Sample Households in 18 Villages**

<b>No.</b>	<b>Village</b>	<b>No of HH Interviewed</b>	<b>Total HH</b>	<b>Percentage</b>
1	HoHsar	18	21	81
2	HoKho	17	62	27
3	KunHlyoe	18	119	15
4	ManHoung	17	22	73
5	ManKaung	18	17	99
6	ManKyu	18	63	28
7	ManLone	18	66	27
8	MongLin	18	57	31
9	NamHson	18	44	40
10	NampMaw	55	171	32
11	NarHsar	16	18	84
12	NarKaNay	18	85	21
13	NarKhan	18	68	26
14	NarMon	18	49	36
15	PangMon	18	34	52
16	PingNyaung	18	32	54
17	SePaung	18	29	60
18	TawNay	18	64	28
Total		357	1021	35

Source: Survey Data, 2021

### 4.3 Survey Results

The survey gathered information from 357 households from Lashio Township. Most of the survey respondents - 78.7 percent - are female respondents, as male household members went outside to earn for the family. The HH's average family size from this study was 5.08.

#### 4.3.1 General Information

As far as marital status is concerned, 80.7 percent are married, 9 percent are widow / widower, 7.3 percent are single, and 3.1 percent separated. Shan ethnicity is 59.7 percent of participants, Pa Long is the second biggest 28.6 percent, and the remainder were Pa-O, Wa and other ethnic groups.

**Table (4.2) Demographic Condition**

Description	N	Percentage
Average number of household members in households	5.08	
Respondent Gender		
Male	76	21.3
Female	281	78.7
Household head	120	33.6
Age		
17 – 20	14	3.9
20- 40	166	46.5
41- 60	147	41.1
61- 80	30	8.4
Marital status		
Single	26	7.3
Married	288	80.7
Separated	11	3.1
Widow/Widower	32	9
Ethnicity of respondents		
Shan	213	59.7
Palaung	102	28.6
Pa-O	1	0.3

<b>Period of stay in current village</b>	<b>Responded Household</b>	<b>Percentage</b>
Less than 5 years	15	4.2
5-10 years	23	6.4
11-20 years	57	16
21-30 years	78	21.8
More than 30 years	184	51.5
Wa	1	0.3
Other	40	11.1

Source: Survey Data, 2021

Half of the respondents of the survey reported that they had lived in their current village for over 30 years. The percentage of persons who stayed in the current area for less than 5 years is only 4.2 as shown in table (4.3) below.

This may be due to the fact of migration of people in the area. Most of the respondents in survey revealed that they received support from the migrants of their family. The replacement of people from Northern Shan was common due the ongoing fighting. Conflict-related displacement and economic migration is also high leading to 99 percent of respondents in Shan North having displaced friends or family.

**Table (4.3) Period of Stay in Current Villages**

<b>Migration pattern</b>	<b>Responded Household</b>	<b>Percentage</b>
To other state or Yangon	7	1.9
Abroad (China, Thailand, Singapore, etc.)	94	26.3
Never	224	62.7
Don't know	2	0.6
Within Township	30	8.4

Source: Survey Data, 2021

### 4.3.2 Household Income

Monthly income reported by household was above 300000 MMK income group is lower than other income groups. The larger percentages were reported in the higher income groups. 30.8 percent of households reported an income of 25,000-50,000 MMK per month.

There were fewer people earn less than 25,000 MMK per month. And a few more percentage of households were reported in the income group of more than 200,000 MMK per month in the survey. Table (4.4) illustrates the income groups.

**Table (4.4) Income Groups and Income Affecting Problems**

<b>Income Groups</b>	<b>Responded Household</b>	<b>Percentage</b>
<25,000 MMK	89	25.1
25,000 - 50,000 MMK	111	30.8
50,000 - 75,000 MMK	44	12.3
75,000 - 100,000 MMK	32	8.9
100,000 - 200,000 MMK	34	9.5
200,000 - 300,000 MMK	12	3.4
>300,000 MMK	6	1.7
Don't Know	15	4.2
No Answer	14	3.9
<b>Factors affecting revenue</b>	<b>Responded Household</b>	<b>Percentage</b>
No	172	48.2
Health problem	84	23.5
Crop failure	59	16.5
Livelihood	23	6.4
Other	19	5.4

Source: Survey Data, 2021

When the respondents were asked about factors affecting their income during survey collection, nearly half (48.2 percent) of participants reported that there was no factor influencing their income. As shown in the table (4.4), the main problems affecting income were recorded as a health problem (23.5 percent) and crop failure (16.5 percent).

#### 4.3.5 Community Organization in the Village

In the survey, 94.1 percent reported the presence of community groups in their village as shown in the table (4.5). Mother groups are the most frequently mentioned community groups, reported by 75 percent of respondents. Community development groups were mentioned by 65 percent of the respondents.

**Table (4.5) Community Organization and Participation**

<b>Community organization in the village</b>	<b>Responded Household</b>	<b>Percentage</b>
Yes	357	94.1
<b>Participation in community organizations</b>	<b>Responded Household</b>	<b>Percentage</b>
Yes	357	48

Source: Survey Data, 2021

About one fifth of the respondents mentioned that youth groups, disaster and fire prevention committee, and water user groups were present in their community.

**Table (4.6) Community Groups and Participation by Households**

<b>Presence community groups and reported participation by households</b>	<b>Responded Household</b>	<b>Presence of Community group</b>	<b>Percentage of Participation (participated in the meeting, activities, and decision)</b>
Mother Group	161	75	45
Village Development	114	65	32
Youth Group	11	19	3
Disaster and Fire	43	15	12
Water User Group (WUG)	7	12	2
School Committee	7	8	2
Village Saving and Loan	7	5	2
Producer Group	7	3	2
One person can participate as a member in 2 or 3 community groups.			

Source: Survey Data, 2021

In the survey, 48 percent of the households that participated in the study of survey responded that they also participated in the meetings and decision-making activities of the local community organizations. The details of the community organization reported during survey period is shown in the table (4.6).

#### 4.3.6 Access to Electricity

Access to electricity, more than 90 percent of the households reported that their household has power supply. This was much higher than the 58.2 percent of households with electricity reported in Demographic and Health (DHS) survey. Power supply could help the households to use electricity for better productivity in their daily routine and economic activities, such as studying, and using machines for income generating activities. The following table (4.7) shows the access to electricity.

**Table (4.7) Access to Electricity**

<b>Access to Electricity</b>	<b>Responded Household</b>	<b>Percentage</b>
Electricity	357	93.6
Access to electricity (in detail)	Responded Household	Percentage
No Electricity	21	6
Electricity for 24 hours	71	20
Electricity for 12 hours	239	67
Electricity for other times	25	7
Source of electricity	Responded Household	Percentage
Public Electricity	1	0.3
Own generator (with fuel)	4	1.2
Solar panel	231	64.7
Hydropower	87	24.3
Batteries (for light)	12	3.36

Source: Survey Data, 2021

As shown in the table (4.7), among those who have electricity, 20 percent of households reported that they received power supply for 24 hours a day. 67 percent of the households reported that they received electricity over the time of 12 to 24 hours. There was supply from solar panel is 64.7 percent in the survey. On the other hand, power supply from hydro power was 24 percent. A few percentages of the households



received power supply from public electricity, own generator, and batteries for light in the survey.

#### **4.3.7 Access to sufficient Water Supply**

Overall result of respondents' water sufficient information of their villages on water supply sufficiency is shown in table (4.8).

**Table (4.8) Sufficient Water Supply**

<b>Description</b>	<b>Not Sufficient</b>	<b>Sufficient</b>
Access to sufficient water supply	40 percent	60 percent

Source: Survey Data, 2021

In the survey, 40 percent of the respondents reported the water supply is not sufficient in their area. It means nearly half of the respondents is facing water scarcity in their area.

#### **4.4 Knowledge of Water, Sanitation and Hygiene**

The Knowledge associated with WASH are of pertinent concern towards sustainable and effective implementation of WASH programs in communities. Such inadequate WASH knowledge leads to poor perception of quality of water resulting in large dependence on surface waters for drinking, open defecation practices being perceived normal and commonly practiced, minimal household water purification practices to prevent diseases, and poor water collection and storage behaviors contaminating water and causing illnesses.

##### **4.4.1 Knowledge of Water Supply, Coping ability and Water quality**

The purpose of this section is to find out the knowledge of water supply and coping ability of the communities during the time of water scarcity.

Respondents were asked the months with water scarcity. About one fifth of the households reported water scarcity during the summer months of March to May, as shown in Table (4.9).

**Table (4.9) Seasonal Water Scarcity**

Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
0	4	22	28	22	15	10	6	2	1	1	1

Source: Survey Data, 2021

Respondents were asked about the coping strategies during water scarcity time and water sources the respondents are using. It can be said that most of the community at least knows where to find enough water.

**Table (4.10) Sources of Water, Availability, and Quality**

Source of Water	Available (percent)	Good (percent)	Fair (percent)	Bad (percent)
Pond	12	6	5	1
Shallow Tube well	1	0	1	0
Open dug well	1	0	1	0
River, Stream	20	14	3	0
Surface water	62	38	22	1

Source: Survey Data, 2021

According to the table (4.10), most households (62 percent) accesses water from a surface water source and most of them considered that water as good quality. One fifth of the households reported the water source as river and stream, and a few percentages of households reported their water source as ponds and wells.

#### **4.4.2 Knowledge on Sanitation and Diseases**

Regarding sanitation, about 91 percent of the respondents knew that dirty water could make people sick and mention at least one waterborne disease while the other 9 percent had no clue as to what was meant by waterborne disease.

**Table (4.11) Knowledge on Waterborne Diseases**

<b>Dirty water can make people sick</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Yes	325	91
No	32	9
<b>Illness related to dirty water</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Diarrhea	186	52
Vomiting / Stomachache	61	17
Worms	14	4
Fever	93	26
Malaria / Dengue	50	14
Miscarriage	4	1
Eye infection	4	1
Skin disease	61	17
Other (kidney disease)	11	3

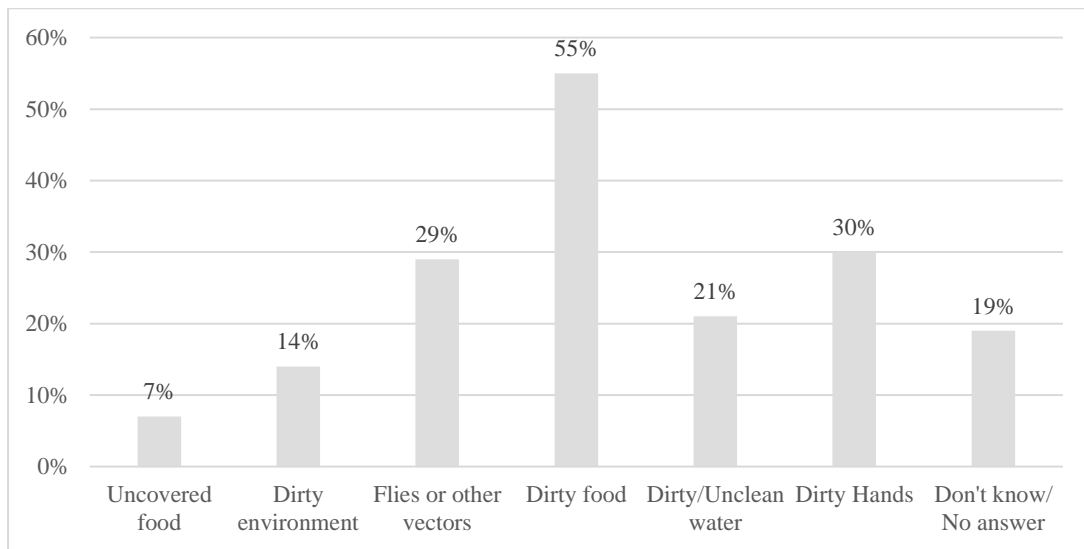
Source: Survey Data, 2021

The community knowledge is quite good in water related disease can make people sick. When participants were asked about whether dirty water can make people sick, more than 90 percent in survey reported dirty water can make people sick.

The community knowledge related to the illness related to dirty water is good. 52 percent of respondents said dirty water can cause diarrhea. The survey respondents also mentioned that dirty water can cause fever (26 percent), vomiting (17 percent), skin disease (17 percent), malaria (14 percent), and kidney disease (3 percent) as shown in the survey results. All answers are corrected.

The knowledge of communities in cause of diarrhea also good. The respondents reported causes of diarrhea were dirty food (55 percent), dirty hands (30 percent), and flies or other vectors (29 percent) as shown in the survey results. However, it is still important to increase the knowledge that diarrhea is caused by unclean hands and 19 percent has no idea. The figure is shown in Figure (4.1).

**Figure (4.1) Knowledge on Causes of Diarrhea**



Source: Survey Data, 2021

#### 4.4.3 Knowledge on the use of toilet and type of latrine

The knowledge on the use of latrine and type of latrine the respondents are using is categorized as the table (4.12).

**Table (4.12) Knowledge on the use of Toilet and Type of Latrine**

Perception and accessibility to toilet	Number of Respondents	Percentage
Using toilet as good habit	351	98
Access to functioning toilet	353	99

Source: Survey Data, 2021

Regarding the perception on the use of a toilet, 98 percent of the respondents in survey reported that using a toilet is a good habit and almost all (99 percent) of households surveyed reported access to a functioning toilet.

In terms of knowledge, it can be assumed that community know about WASH. Television program (training) and some diarrhea cases are supportive factors for them to build latrine. The households which is sharing latrine with their neighbor make open defecation due to some limitations such as land, cost, flooded place and their attitude to build latrine.

#### 4.4.4 Knowledge about Health and Waste Management

The purpose of this section is to find out the knowledge on health and waste management of Lashio communities.

**Table (4.13) Knowledge about Health and Waste Management**

No.	Description	Total Respondents HH	self-ranking score
1	Knowledge about waste management	121 Households	34 percent of the participants reported the score of greater than the medium score of 5
2	Percentage of self-ranking score on health and hygiene knowledge	171 Households	About half (48 percent) of the respondents gave greater than the medium score of 5

Source: Survey Data, 2021

Participants self-ranking score for knowledge about waste management is shown in the results. 34 percent of the participants reported the score of greater than the medium score of 5. It is showing how they are understanding knowledge about waste management. The question is where you would rank your knowledge about proper waste management. It is mean how it is best to dispose of the garbage.

The score of health and hygiene knowledge of the respondents is shown in the survey results. About half (48 percent) of the respondents gave greater than the medium score of 5. The communities' knowledge on health and hygiene is good in the survey results. where would you rank your knowledge about hygiene? Mainly asking about how understanding why hygiene is important for health.

**Table (4.14) Knowledge about Health Risks**

<b>Health risks caused by dumped waste</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Attracts rodents and other animals	46	13
Insects (flies, mosquitos) can breed	82	23
Blocks Drainage Channels	4	1
Can attract snakes	4	1
Smells bad	129	36
Causes disputes between HHs	4	1
Looks unclean, untidy	64	18
Cause disease	4	1

Source: Survey Data, 2021

According to survey result, 52 percent of the respondents thought that dumping wastes can cause health risks. The health risks mentioned in the survey are shown in the table (4.14). The most mentioned risks were bad smell (36 percent), breeding of insects (23 percent), unclean and dirty look (18 percent) and attraction of rodents and other animals (13 percent). As the highest percentage is 36 percent, the community required to increase knowledge about health risk due to dumped waste.

45 percent of the respondents reported the presence of a health worker in their community in the survey. A significant good in the percentage of having hygiene information. This information shows how communities getting the personal hygiene knowledge.

The survey revealed that most of the respondents who had knowledge about personal hygiene got it from school, home and training (health worker). But some of households did not know about the route of personal hygiene.

#### **4.5 Attitude of Water, Sanitation and Hygiene**

Lack of attitude on WASH is one of the most imperative causes for transmission of infectious diseases. Effectiveness of WASH depends not only on the provision of WASH facilities but also, and most importantly, on the compliance of individuals. Unless people have adequate KAP in relation to WASH, mere access to the services is not sufficient to mitigate health problems related to unsafe water, poor sanitation, and hygiene. The extent of safe WASH practices can be determined by the people's knowledge and attitudes towards WASH.

#### 4.5.1 Attitude of water treatment and barriers

Most of the households treat drinking water, reported as 80 percent in the survey. Safe drinking water is essential for the health of the family members. 98 percent of respondents from the survey reported that they did not have barriers to access water as reported in table (4.15).

**Table (4.15) Attitude of Water Treatment and Barriers**

<b>Treatment of drinking water</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Treated	286	80
Not Treated	71	20
<b>Barriers / limitations to access water</b>	<b>Number of Respondents</b>	<b>Percentage</b>
No	349	98
Always	3	1
Sometimes	5	1

Source: Survey Data, 2021

#### 4.5.2 Attitude of Waste Disposal

Regarding to the Attitude of waste management, community have a good knowledge and attitude. 40 percent of households from the survey reported that there was no waste disposal facility in their village.

**Table (4.16) Attitude of Waste Disposal**

<b>Waste disposal facility in the village</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Collect waste and have organized disposal	21	5.9
Every HH has its own system	28	7.9
Waste tank in village	164	45.8
<b>Means of waste disposal at household level</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Burning	207	58
Dumping into river, bush, or field	25	7
Waste tank	125	35

Source: Survey Data, 2021

In the villages, the waste disposal system has changed throughout the years. Currently, most of the households are managing their waste through the village waste tanks, while most of the households had their own system in the survey

58 percent burning the waste and 35 percent dumping the waste tank but it is not sure whether there is any knowledge of possible air pollution. The percentage of dumping waste into rivers, bushes, or fields, and only 7 percent of the households reported it. If something happens in health problem, community know how much they can expense for medical charges. It is showing an expression of health attitude.

#### **4.5.3 Attitude of Getting Hygiene Knowledge, Handwashing, and Prevention of Diarrhea**

The purpose of this section is to analyze the communities' attitude on seeking knowledge, handwashing facility and prevention of diarrhea.

**Table (4.17) Attitude of Getting Hygiene Knowledge, and Prevention of Diarrhea**

<b>Source of information about personal hygiene</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Don't know	75	21
School	54	15
Home	75	21
Training	154	43
<b>Means to prevent diarrhea</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Don't know	61	17
Drink clean water	57	16
Eat clean food	164	46
Wash hand with soap or ash	57	16
Use toilet	18	5

Source: Survey Data, 2021

The communities are mainly received information about personal hygiene from specialized training in the villages as 43 percent of respondents mentioned that training as the source of information.



According to the responses on the attitude that diarrhea can be prevented, 68 percent respondents said diarrhea can be prevented. The most reported means to prevent diarrhea reported in the survey was to eat clean food (46 percent) and to wash hands with soap or ash. The proportion of households who did not know how to prevent diarrhea was reported in the survey, a total of 17 percent of households.

#### 4.5.4 Attitude of Handwashing

The community perception regarding handwashing practice was more important before mealtimes which was the highest percentage reported for the question of “what is the most important time to wash hands?”

**Table (4.18) Attitude of Handwashing**

<b>Time to wash hand</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Before eating	303	85
Before feeding/ breast feeding	14	4
After touching/ playing with children	4	1
After cleaning infant's feces	11	3
After bathing an infant	4	1
After using toilet	214	60
don't know	4	1
Other	11	3
<b>Handwashing place near toilet</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Present	161	45
Not Present	196	55
<b>Reasons for not having separate washing place after toilet</b>	<b>Number of Respondents</b>	<b>Percentage</b>
No Money to build	32	16
No Answer	4	2
No Water	25	13
Not important	4	2
Go and wash at bathing place	128	65
Other	4	2

Source: Survey Data, 2021

45 percent of households can access to handwashing facility after the toilet use. This also shows that half of the community have a good knowledge and attitude. Rural people are likely to have more awareness on hygiene knowledge form health worker or health staffs. And 55 percent of respondents did not have separated handwashing facility after using toilet. The main reason is respondent household members are washing hands at bathing space after using toilet according to the table (4.20) 65 percent respondents washed hands at bathing space. 16 percent of the respondent's household mentioned no money to build and 13 percent gave the reason of no water.

85 percent respondents give the correct answer important time wash hands are after using the latrine, before eating the meal and after touching children feces and wastes. The proportion of households who did not know how to prevent diarrhea was analyzed in the survey, a total of 5 percent of households 45 percent of households have a handwashing place near the toilet and 36 percent said they go and wash at bathing place, which means 81 percent of households can access to handwashing facility after the toilet use. The percentage is still lower than the percentage from the overall Shan State figure (87 percent) of percentage of households with handwashing facility from Myanmar DHS survey.

The community perception regarding handwashing practice was more important before mealtimes which was the highest percentage reported for the question of “what is the most important time to wash hands?” the survey result reports the important times to wash hands.

#### 4.5.5 Medical Expense of Household Members

This section is showing the communities attitude how they act when they feel sick, go to the clinic or medical shop. And the results showing their medical expenses.

**Table (4.19) Medical Expense**

<b>Medical Expense</b>	<b>Number of Respondents</b>	<b>Percentage</b>
No medical expense	149	42
Don't know/ No answer	17	5
Less than 5000 MMK	37	10
5-10000 MMK	35	10
10-15000 MMK	21	6
15-20000 MMK	23	7
20-50000 MMK	34	10
More than 50000 MMK	41	12

Source: Survey Data, 2021

Households' medical expenses for 4 months reported in survey, 41.5 percent did not need to cover medical expenses. Households who need more than 50,000 MMK for medical bills in the survey was 11.5 percent.

Diarrhea is a leading killer of children, accounting for approximately 8 per cent of all deaths among children under age 5 worldwide in 2016. Proportion of children under five years old with diarrhea receiving oral rehydration salt was 62 percent reported by Myanmar DHS survey, 2015-16. When the respondents were asked about what they will do first for a child with diarrhea at home, only 12.4 percent reported providing ORS (from grocery or home-made). Very few percentages reported that they will give extra water.

#### 4.6 Practices of Water, Sanitation and Hygiene

The practices regarding WASH are contributing factors to waterborne disease prevalence in communities; poor WASH knowledge leads to unhygienic practices and poor attitudes which pollute water and spread illness. Household and environmental hygiene also tend to be poor, and human/ children stool is often overlooked and

perceived harmless in sanitation programs, hence increasing the risk of disease transmission, all due to limited WASH understanding and poor attitudes and practices towards WASH. Therefore, there is a need to provide hygiene education programs and increased awareness towards promoting good WASH practices and ensuring good public health in the communities.

#### **4.6.1 Practice on Treatment of Drinking water**

Most of the households treat drinking water, reported as 80 percent in the survey. Safe drinking water is essential for the health of the family members. The following table (4.20) mentioned the respondent's practices on treating water to become safe water.

**Table (4.20) Water Treatment**

<b>Water Treatment Method</b>	<b>Count</b>	<b>Percent</b>
Boiling	121	34
Filtering	186	52
Others	50	14

Source: Survey Data, 2021

The major treatment methods reported in the survey were filtering (52 percent) and boiling (34 percent). As most of the households can now access to domestic water and treated drinking water, buying is the last option for drinking water. According to this figure the respondents still required knowledge and right practices for safe drinking water availability although 52 percent used filtering method, the filtering methods are not proper ways to get safe water.

#### 4.6.2 Time Used to Reach Water Source

The time spent to the nearest water source from the respondent's home are presented in table (4.21).

**Table (4.21) Time Used to Reach Water Source**

<b>Time Spent</b>	<b>Less than 15 min</b>	<b>15-30 min</b>	<b>More than 30 min</b>
Number of Respondents	275	39	43
Percentage	77	11	12

Source: Survey Data, 2021

According to the table (4.21), 77 percent of the households use less than 15 minutes to reach water, 11 percent take between 15 to 30 minutes and 12 percent take over 30 minutes. As nearly one-third, 30 percent of the households reported that they received water through a piped water system and time to reach water source was reported as less than 15 minutes category. Reducing time to reach water has many benefits to the household members, both health and non-health benefits. People can have more time to do other household chores and use more time for education and economic activities.

#### 4.6.3 Coping Strategy for Water Scarcity

The purpose of the section is to find out the knowledge of coping strategy for water scarcity in their locations.

**Table (4.22) Coping Strategy for Water Scarcity**

<b>Options</b>	<b>No Strategy</b>	<b>Buy Drinking Water</b>	<b>Move to another place</b>	<b>Get water from further away</b>	<b>Use less water</b>
Number of Respondents	86	7	0	179	86
Percentage	24	2	0	50	24

Source: Survey Data, 2021

This survey also revealed that only 2 percent of the households are buying drinking water. It can be assumed that if drinking water would be available in acceptable quality, these households might apply different practices. When during lean

season water scarcity is affecting many HHs, people have developed several coping mechanisms. Most households try to secure their needs for water through accessing a further-away water source (50 percent). Another group of 24 percent of the households have no strategy or don't know what to do.

#### 4.6.4 Water Storage System

This section showing communities' practice level of Water storage in their households.

**Table (4.23) Water Storage Status**

<b>Household water storage ways</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Plastic water bucket with cover	267	75
Concrete water tank with cover	59	17
Water container without cover	28	8
No storage facilities	2	1

Source: Survey Data, 2021

Main method of transport of water from source to their home was using bucket and pipe. Majority of them stored water in Plastic water bucket with cover (75 percent) followed by concrete water tank with cover (17 percent), water container without cover (8 percent) and no water storage at all (1 percent).

In the in-person observation of safely stored drinking water as practiced by the study participants. Out of 357 households, around 90 percent had stored drinking water in clean container and had covered it. However, in 15 percent of the household drinking water container was within the reach of animals.

#### 4.6.5 Type of Latrine

The purpose of this section is to find out the practices on type of household latrine and what type of latrine do community use.

**Table (4.24) Type of Latrine in Communities**

Type of Latrine	Number of Respondents	Percentage
Fly proof	175	49
Direct pit	39	11
Semi-permanent latrine	111	31
Trench Latrine	32	9

Source: Survey Data, 2021

The standard latrine in household level is fly proof latrine. The standard of household latrine is the high of latrine door should have six feet, the latrine bowl/pan must be covered, the latrine pit should be three feet wide and six feet high and be fly proof. The latrines used in the village level are good if they are fly proof. The major type of latrine from the households was fly proof latrine (49 percent) followed by the semi-permanent latrine (31 percent) and direct pit latrine (11 percent) as shown in figure. Regarding the disposal of children's excreta, among those who have children in their home, most of them throw the waste into the latrine. This shows that the knowledge how to construct the household latrine.

#### 4.6.6 Handwashing Practice

The purpose of this section is to find out the practices on handwashing after using toilets and before eating.

**Table (4.25) Handwashing Practice Status**

Hand washing practice after using toilet and before eating	Number of Respondents	Percentage
No	4	1
Always	294	82
Sometimes	59	17

Source: Survey Data, 2021

According to the findings, 82 percent of the respondents always wash their hands after using toilet and before eating, 17 percent of the respondents do not wash always, just washing hands sometimes while 1 percent do not wash at all.

The results showed that one fifth of the communities are still lack of proper practice of handwashing.

#### 4.6.7 Use of mosquito net and teeth brushing practice

The respondents are assessed their practices toward using mosquito net and brushing teeth.

**Table (4.26) Use of Mosquito Net and Teeth Brushing Practice Status**

<b>Use of mosquito net during the night</b>	<b>Number of Respondents</b>	<b>Percentage</b>
No	7	2
Always	323	91
Sometimes	27	7
<b>Teeth brushing practice</b>	<b>Number of Respondents</b>	<b>Percentage</b>
No one	7	2
Brush daily	313	88
Brush occasionally	37	10
<b>Teeth brushing with toothpaste</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Brushing teeth with toothpaste	303	85
Brushing teeth without toothpaste	54	15

Source: Survey Data, 2021

Using a mosquito net is also a good practice. Most of villagers are using mosquito net during the night. Only a few numbers of people are not use it. Hoped that those who not using mosquito net will be a good practice in future.

The study indicated that the level of hygiene and sanitation practices was medium in the household level. Brushing teeth behavior has good to 88 percent in the survey. In the survey 85 percent of respondents who brush their teeth use toothbrush



and toothpaste. The percentage of brushing teeth with toothbrush and paste among community might be increasing.

We can say it is good behavior, but those who brush their teeth, need to consider for the availability of toothpaste. As the overall brushing behavior increase, the supply of toothpastes probably decreases in the family. Use of mosquito net at nights. The household habit of using a mosquito net at nights was asked in the survey.

91 percent of households reported using mosquito net at nights in survey. The person who practiced in handwashing that they did mostly before eating and after visiting the toilet. This practice was mostly affected by the fact that water was not always available in some rural areas of village.

#### 4.6.8 Level of Knowledge, Attitude and Practices on WASH

**Table (4.27) Level of Knowledge on Water, Sanitation, and Hygiene**

<b>Particular</b>	<b>Count of correct answered respondents</b>	<b>Percent of correct answered respondents</b>
Dirty water can make people sick (YES) (Knowledge on waterborne diseases)	325	91
Illness related to dirty water (Diarrhea) (Knowledge on waterborne diseases)	186	52
Using toilet as good habit (Knowledge on Sanitation)	351	98
Access to functioning toilet (Knowledge on Sanitation)	353	99
Knowledge about waste management (Knowledge on Sanitation)	121	34
health and hygiene knowledge (Knowledge on Hygiene)	171	48

Source: Survey Data, 2021

It is observed that the rural communities in Lashio township have good knowledge in waterborne diseases, using toilet as good habit and accessing to functioning toilet by responding the right answers with over 90 percent respondents.

However, the communities are still weak in the knowledge of dirty water causes diarrhea (52% responded correct answer), knowledge of proper waste management system (34% responded correct answer) and knowledge of hygiene can support good health (48% responded correct answer). According to these findings, it can interpret that it is still required to promote waste management, hygiene and diarrhea related knowledge in these communities.

**Table (4.28) Level of Attitude on Water, Sanitation, and Hygiene**

<b>Particular</b>	<b>Count of correct answered respondents</b>	<b>Percent of correct answered respondents</b>
Treatment of drinking water (Treated)	286	80
Means of waste disposal at household level (Burning and using waste tank)	332	93
Means to prevent diarrhea (Clean water and food, Wash hand and use toilet)	296	83
Time to wash hand (Before eating)	303	85
Time to wash hand (After using the toilet)	214	60
Handwashing place near toilet (Present)	161	45

Source: Survey Data, 2021

Positive attitude on treatment of drinking water, disposing waste by burning and waste tank, washing hands before eating and prevention of diarrhea were observed in over 80 percent of the respondents according to table (4.28). Although the respondents have good attitude to wash hands before eating with 85 percent, 40 percent did not have proper attitude of washing hands after using toilet as only 60 percent can respond correct answer. And 55 percent of the respondents did not have separated place for handwashing after using toilet.

**Table (4.29) Level of Practice on Water, Sanitation, and Hygiene**

<b>Particular</b>	<b>Count of correct answered respondents</b>	<b>Percent of correct answered respondents</b>
Water Treatment Method (Boiling and Filtering)	307	86
Household water storage ways (Water tank/ bucket with cover)	326	92
Fly Proof latrine	175	49
Hand washing practice after using toilet and before eating (always)	294	82
Use of mosquito net during the night (Always)	323	91
Teeth brushing practice (Brush Daily)	313	88

Source: Survey Data, 2021

According to table (4.29), good practices on water treatment (86 percent), water storage system (92 percent), handwashing (82 percent), uses of mosquito net (91 percent), and teeth brushing (88 percent) were observed in over 80 percent of the respondents. But the uses of fly-proof latrine in the communities is not enough coverage with only 49 percent can use fly-proof latrine. For latrine, some of households are still difficulties to build improved latrines due to cost, space, and awareness. It is often difficult to urge poor family, family of only elder people, land less family and family having less awareness to practice properly. Open defecation is still very few households responded that they have defecated in the open place in last previous time.

In terms of the survey results, the attitude and practices were also found to be medium level among villagers while survey results indicated that there is lack of knowledge and practices. The lack of maintenance in sanitary facilities indicates that village committee were ignoring the importance of using clean toilets. The observations during survey visit indicated that the schools in the survey areas had adequate sanitation facilities which were well maintained.

## **CHAPTER 5**

### **CONCLUSION**

The main objective of the study was to assess and analyze the level of knowledge, attitude and practice on water, sanitation and hygiene of the rural communities in Lashio Township of Northern Shan State.

#### **5.1 Findings**

There was improving practice and changing behavior in the communities. Most remarkable findings were more community participation and development of community groups; better water supply; improved community awareness on hygiene; better waste disposal system in the village and households; more access to handwashing facilities and improved handwashing behavior; improved knowledge about diarrhea; and better practice of using mosquito nets at night.

However, there is also some room to improve that the communities should maintain good behaviors and good practices and still need to change some bad behaviors and need to improve latrine design, handwashing facilities, personal hygiene and so on.

To promote community participation and decision making in community groups: In general, the participation of the community groups by the households was lower than those existence. The community is aware of the existence of the village committee groups but not fully participated. There were community groups in the villages, but the respondent's reported participation is low.

75 percent said there was mother group in their village but only 45 percent reported that they take part in those mother groups. There is room for improve to mobilize the community and promote participation in the community groups during the coming years.

Need to consider ways to solve the problems affecting the income: The communities' main problems affecting their income last year were recorded as health

problems (23.5 percent) and crop failure (16.5 percent). The community should consider options to mitigate this and support the families whose income was affected. To consider working for sufficient water supply: In the survey, 60 percent of the respondents reported that they received sufficient water supply throughout the year.

The identified focal person for water supply need monitoring and supervision support from the village committee to understand the need of the community and implementation of water supply system. The village committee should consider the ways for continuous water supply throughout the year including the summer season. To consider working on promoting community health and hygiene knowledge: It can be concluded that the knowledge of community was good about health and hygiene in the survey. The practice of using toilet and disposal of children feces were also not too bad.

The village committee and volunteers should develop a health promotion plan in consideration to have a full coverage for each village, make sure the plan for knowledge of health education sessions per month. The number of health education sessions should be planned according to the village population.

Need to establish waste disposal facility in all villages: 40 percent of households from survey result that there was no waste disposal facility in the village. If communities don't know how to construct the waste disposal facility in the village, can request to UNICEF and Save the Children which is based on the Lashio township.

Consider promoting handwashing behavior: The community has practiced good hygiene behavior. However, only 70 percent practiced washing with soap and water after toilet use and before eating, which is the safer handwashing behavior. In the coming years, the communities can consider for the availability of soap in the households for handwashing.

To care of a sick/diarrhea child at home: Participants' knowledge regarding diarrhea was also good but there is room for improvement for the health knowledge to promote the caring of the diarrhea child at home. First thing to do for a child with diarrhea at home, only 12.4 percent reported providing ORS (from grocery or home-made). Very few percentages reported that they will give extra water.

*Migration:* There was an increasing in the percentages of migration to other countries and within township.

*Income:* Monthly income reported by household was increasing in survey. 30.5 percent of households reported an income of 25,000-50,000 MMK per month.

*Water supply:* 60 percent of participants reported receiving sufficient water supply throughout the year in the survey. Majority of households (62 percent) access water from surface water source and most of them considered that water as good quality.

77 percent of the households use less than 15 minute to reach water. The percentage of households who stored water in plastic water bucket and concrete water tank with cover was increasing. The percentage using water containers without cover was reducing.

Most of the households treat drinking water- reported as 80 percent in the survey. The major treatment methods reported in the survey were filtering (52 percent) and boiling (34 percent). 98 percent of respondents from the survey reported that they did not have barriers to access water.

*Sanitation knowledge and practice:* Knowledge of community on healthy hygiene has increasing: When respondents were questioned about their knowledge regarding how contaminated water can make people sick, the right response was recorded by more than 90 percent in the survey assessment.

98 percent of survey study participants indicated that toilet use was a good habit. Nearly all (99 percent) of households interviewed reported access to the functioning toilet during survey data collection. Survey households ' main type of latrine was fly proof latrine (49 percent), followed by semi-permanent latrine (31 percent) and direct pit latrine (11 percent).

*Knowledge about diarrhea:* The knowledge of respondents regarding diarrhea has also been improving. Dirty foods (55 percent), dirty hands (30 percent), and flies or other vectors (29 percent) were mostly reported by participants. Knowing that diarrhea can be avoided has been increasing in the survey, 68 percent of participants said that it was possible to prevent diarrhea.

To improve the practices of caring for a child with diarrhea: only 12.4 percent reported receiving ORS (from the grocery store or home-made). Very few percentages have indicated giving extra water to the sick child. 54 percent of survey households reported consulting the local pharmacy or grocery store selling medication about correct methods of treatment.

## 5.2 Recommendations

This study can identify the knowledge, attitude, and practice (KAP) on water, sanitation, and hygiene of rural communities in Lashio Township.

The survey finding suggests to respondents: they should pay great attention to water handling methods by sensitizing households to healthy behavior particularly in the water collection and storage conditions. In addition, some respondents use water directly from available sources without any form of treatment, and may, therefore, be exposed to various water-related diseases, it seems logical to suggest that the quality assessment of the water source should be conducted time to time assure that safe drinking water is available to everyone. Regardless for the improvement of access to safe water supply and access to improved sanitation facilities, a country never gets the progress to fight against 62 poverties so supply of water at household level can play a vital role to reducing waterborne diseases and save many live. Additionally, the health care system should be updated with acceleration effort of government to get the healthy life by accessing the proper health care services.

The survey results suggested that there may be a need for a strengthened focus providing a safer, cleaner environment in the home and in influencing household hygiene practices, such as the use of soap (making soap and water available in the household for handwashing). The emphasis should be on hygiene behavior related to handwashing at critical times and use of latrines for defecation. If community are involved into the development process as active participants, they can become change agents within their families and an impetus access to community development.

It is recommended that health awareness programs targeting mothers, children to increase knowledge on better household hygiene practices and hygiene education promotion program should be provided to the public by the cooperation of health staff and respective persons. To be concluded, water-borne diseases have increased the cost of illness in direct and indirect terms leading to poverty in the end. Policy enhancement by government, community mobilization, networking with different partners for advocacy, assisting counterparts for capacity building leads to sustainable awareness of water and sanitation in the community. Safe water, sanitation and hygiene are tackled to reduce mortality rate and to end preventable deaths of peoples.

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# APPENDIX

## Appendix 1

A Study on situation of water, sanitation and hygiene selected area,  
Myanmar  
(Household Questionnaire)

### INTRODUCTION AND CONSENT

Mingalabar. My name is ..... I am a student of Master of Public Administration, Yangon University of Economics. We are conducting a survey about Water, Sanitation and Hygiene in Lashio Township. The information we collect will help my thesis completion and contribution sustainable WASH. Your household was selected for the survey. I would like to ask you some questions about your household. We will then interview women and men with individual questionnaires. The household questions usually take about 15 to 30 minutes. All the answers you give will be confidential and will not be shared with anyone other than members of our survey team. You don't have to be in the survey, but we hope you will agree to answer the questions since your views are important. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time.

QUESTIONNAIRE No: .....

Date:

.....

Location: Village.....

Township:

.....

### Note:

Interview only Adults!

Listening well is most important!

General Household Information

Q.1. How many family members in your HH?	Q2. Are you Household head ? Yes: 1          No: 2	Q3. Gender Female: 1 Male: 2	Q.4. Interviewee Age Actual age: _____
Q.5: Marital Status Single 1          Married 2          Separated/divorced 3          Widow / widower 4			

Q6: How long have you and your family lived in this village? \_\_\_\_\_ Years

Q.7: Please list all persons of this HH?

Also include information about sickness days, if any!  
(estimate to the best of your knowledge)!!

HH member Age Table			Sickness days during last 12 months
Years of Age	Female	Male	
0-12			
up to 18			
up to 35			
up to 50			
>50			

Q.8: Does your Household have a member with disabilities or special needs?

YES  NO  (please tick)

If yes, please identify

- Mentally retarded           Hearing           Seeing  
 Walking or climbing stairs  
 Self-care (washing, dressing)           Communicating           Other:  
\_\_\_\_\_

Q.9: Ethnicity

Ethnicity	<input type="checkbox"/> Shan <input type="checkbox"/> Pa Laung <input type="checkbox"/> Pa O <input type="checkbox"/> Lar Hu <input type="checkbox"/> Wa <input type="checkbox"/> Other (specify)
-----------	---

Q.10: Means of Communication:

Do you have a cellphone?

YES  NO

Q.11: Was the village affected by conflict in the past?

Yes and When	<input type="checkbox"/> Recently <input type="checkbox"/> two years ago <input type="checkbox"/> five years ago <input type="checkbox"/> ten years ago	No
--------------	--	----

Q.12: What is your currently felt security level?

(Children can freely go to school, can do farm work, can travel to next town and market, etc.)

Not secure Safe  
 Very secure

Q.13: From whom can your HH receive assistance in your community?

- (1) Neighbors       (2) Relatives       (3) Village association       (4) Don't know
- (5) No support available, I think       (6) other (Specify)

Q.14: Did any of your household members migrate to outside the community for seeking work?

- (1) To other state or Yangon       (2) Abroad (China, Thailand, Singapore, etc.)   
 (3) Never       (4) Don't know       (5) Within Township

Q. 15. Does your HH receive financial support from migrated family members?

- YES       NO

Q.16: What are your Household Member Skills?

We have following skills in our family (i.e. handicraft, Farming , Carpentry, Masonary , buying and selling, other ... )

Skill 1:

Skill 2:

Skill 3: \_\_\_\_\_

Skill 4: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Q.17: What are the sources of Income for your household?

Sr	Income Source	percent of total income
1	Agriculture products (rice, beans, vegies, etc.)	
2	Fisheries, Livestock	
3	Daily farm labour work outside the home	
4	Technical work, handicraft or craftsmanship	
5	Home-made liquor (beverages)	
6	Selling Betel nuts	
7	Selling other goods through a shop	
8	Forestry products, minerals	
9	Trading business	
10	Regular employment	
11	Remittances / contributions from family or friends who live elsewhere	
12	Rental of assets (land, house, machinery, etc.)	
13	Pension	
14	Other.....	
<b>TOTAL</b>		<b>100</b>

Q.18: How much income do you have in average per month?

- less than 25.000  25.000 – 50.000
- 50.000 – 75.000
- 75.000 - 100.000  100.000 – 200.000
- 200.000 – 300.000
- more than 300.000

Q.19: What was your biggest problem last year that affected your income?

- Health problem  Crop failure
- Conflict\_\_\_\_\_

- Livelihood \_\_\_\_\_  Other (Specify)
- \_\_\_\_\_

Q.20: Did you or any HH member participate in health/hygiene training within the last 12 months?

- (1) No  (2) Yes  Who offered training?
- \_\_\_\_\_

- (3) Don't know

Q.21 (a): Are there any community organization in your village? (1) Yes (2) No

If yes,

Tick the organization the respondent answered.

- Village Development Committee (VDC)
- Water User Group (WUG)
- Forest User Group (FUG)
- Village Saving and Loan Association (VSLA)
- Producer Group (cooperative, etc.)
- Disaster and Fire prevention committee
- Other ...(Specify)

Water Supply

Q.22: Do you have sufficient water supply throughout the year?

YES  NO

If NO, indicate the months of water scarcity:

Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec

Q.24: What is the source and quality of water you have access to?

- (a) Pond (1) Good (Drinkable) (2) Fair  
(3) Not good
- (b) Gravity FW (1) Good (2) Fair  
(3) Not good
- (c) Shallow Tube well (1) Good (2) Fair  
(3) Not good
- (d) Open dug well (1) Good (2) Fair  
(3) Not good
- (e) River, Stream (1) Good (2) Fair  
(3) Not good

Q.25: Does your household  Yes  
CHANGE WATER SOURCES  NO  
during the year?

Q.25.1: WHY you CHANGE  
WATER SOURCES?

- a) Insufficient Quantity of water
  - b) Rainwater Preferred source
  - c) Water Quality becomes  
POOR
  - d) Change in the taste
  - e) Broken pump
  - f) Other
-

Q.26: How long does it take time to bring water from the water source to the house?

(a) Less than 15 minutes (b) 15-30 minutes (C) More than 30 minutes

(b) How do you collect water?

(a) by hand (b) by yoke (c) by cart (d) by trawlergy

(e) by motor cycle

Q.27: Where do you store your water?

(1) No storage facilities  (2) Concrete water tank with cover

(3) Plastic water bucket  (4) Water container without cover

(5) Other means  \_\_\_\_\_

Q.28: Do you treat your drinking water? YES  NO

Sometimes

If Yes, how ?

(a) Boiling (b) Filter (cloth, ceramic) (c) Treated with Chemical

(d) Other (Specify below)

---

Q.29: Do you buy drinking water?

YES  If YES, I buy regularly  I

buy only sometimes  NO

Q.30: What is your coping strategy when water supply is short?

(1) No strategy  (2) Buy drinking water  (3) Move to another place

(4) Get water from further away  (5) Use less water

(6) Other means

---

Q.31: Does your family see any barriers / limitations to access water?

(1) NO  (2) YES  (3) Sometimes

(4) Our family has limited rights to access water source

(5) Well or water source is far away



(6) Well or water source is (partly) contaminated

(6) Other barriers

---

### SANITATION

Q.32: Where would you rank your knowledge about hygiene?

(Understanding why hygiene is important)

1. Poor knowledge                      2. I'm not sure.                      3. Very good knowledgeable.

Q.33: Do you think WATER CAN

MAKE PEOPLE SICK?

Yes

NO

Q.33.1: If Yes, WHAT ILLNESSES

can water cause?

(if contaminated)

(you can circle more than 1)

- a) Diarrhea
- b) Vomiting / Stomach Ache
- c) Worms
- d) Fever
- e) Malaria / Dengue
- f) Miscarriage
- g) Eye infection
- h) Skin disease
- i) Other

Q.34: Do you think it is a good habit to use a toilet?

Don't know       Yes       NO       It does not matter

Q.35: Do you and HH members have access to a functioning toilet?

YES                       NO

Q.35.1: If yes, what type of latrine?

Fly proof               Direct pit               Semi-permanent latrine

Trench Latrine

Other  \_\_\_\_\_

Q.35.1(A): Does your household own that latrine?

YES  NO

Q35.1.B: If not, how many households share that latrine?

Number of HH -----

Q.35.2: Do you and HH members use the latrine?

NO  Sometimes  we all use it

Children don't use

Q.35.3: If the HH has No toilet, why not?  
What are the main difficulties or opinion?

- a) Money (poor income, cannot afford)
- b) Ground situation (Rocks)
- c) Lack of space in compound
- d) No access to building materials
- e) No access to builders/ carpenters
- f) Cannot see the great need for it
- g) Other

Q.35.4: IF NO LATRINE; what are  
your defecation habits?

- a) Do not want to answer
- b) Night Soil / Use in a plastic bag
- c) Open Defecation
- d) Use the neighbors' latrine
- e) River / stream
- f) Other

.....

Q.36: How do you  
DISPOSE infant feces?

- a) DO NOT HAVE INFANTS in HH (Go to next Q.)
- b) Do not want to answer
- c) Throw in the WASTE DISPOSAL bins
- d) Throw in the Latrine
- e) Throw in fields, bush,
- f) Other

.....

Q.37: How do your neighbors practice defecation?

- a) Don't know
- b) Do not want to answer
- c) Night Soil / Use in a plastic bag
- d) Open Defecation
- e) Use the neighbors' latrine
- f) Use neighbor latrine
- g) Other

.....

Q.38: Do you or any HH member have any objections to use a toilet?

- a) NO objections
- b) It is Not my culture
- c) Don't want to be seen using a latrine
- d) Latrine SMELLS bad
- e) Poor domestic water supply and accessories
- f) Other.....

(you can circle more than

1)

Q.39: Do you have a handwashing place with water near the toilet for washing hands?

(1) NO  (2) YES

Q.39.1: If NO, what are the reasons you don't have a handwashing place?

- a) Do not want to answer
- b) No money to install
- c) No water
- d) Not so important to us
- e) Other.....

Q.40: Do you wash your hands after using toilet?

- (1) NO  (2) YES  (3) Sometimes, when water is enough

Q.40.1: If yes, how do you do it?

- (1) Water only  (2) Water and Soap  (3) Water with Ashes or Sand   
(4) other way  \_\_\_\_\_

Q.40.2: If you don't wash your hands after toilet, why not? (please indicate)

- (1) We are not used to it  (2) Water scarcity   
(3) Washing place too far away  (4) I think it does not matter   
(5) We don't know why

Q.41: Do you wash your hands before eating meal?

- (1) NO  (2) YES  (3) Sometimes, when there is water

Q.41.1: If yes, how do you do it?

- (1) Water only  (2) Water and Soap  (3) Water with Ashes or Sand   
(4) other way  \_\_\_\_\_

Q.41.2: What do you think are  
IMPORTANT TIMES to wash  
hands?

(you can circle more than 1)

- a) Don't know
  - b) Before eating food
  - c) Before feeding or BREASTFEEDING infant
  - d) After touching / playing with children
  - e) AFTER cleaning infant's bottom
  - f) After bathing an infant
  - g) After using toilet
  - h) Other
- \_\_\_\_\_

Q.41.3: If you don't wash your hands before eating, what are the reasons? (please indicate)

- (1) We are not used to it  (2) Water scarcity  (3) Washing place too far away   
(4) I think it does not matter  (5) We don't know why  (6) other
- 

Q.41.3(A): Is there VDC in your village working for the WASH for the community?

YES  NO

### Health

- Q.42: HOW MUCH MONEY does your HH spent on MEDICAL BILLS in average the last 4 month?  
(estimation in average)
- a) NO MEDICAL EXPENSES
  - b) Don't Know / Don't want to answer
  - c) Less than 5,000 MMK
  - d) 5-10,000 MMK
  - e) 10-15,000 MMK
  - f) 15-20,000 MMK
  - g) 20-50,000 MMK
  - h) More than 50,000

Q.43: Where would you rank your knowledge about proper waste management?

Poor knowledge

I am not sure

Very good knowledge

Q.44: Do you have access to a safe waste disposal facility in your village?

NO, we do not have that in our village

YES, we collect waste and have organized disposal

Every HH has its own system

Other ....

---

Q.45: How does your HH deal with waste?

- (1) We burn the waste, including plastic
  - (2) We separate waste and collect materials for recycling
  - (3) We dump into the near river, bush or field
  - (4) We bury the rubbish
  - (5) We have a collection pit and cover it with soil from time to time
  - (6) We compost all organic waste
  - (7) Other ....
- 

Q.46: Is solid waste a problem you're your Household in a sense that you don't know exactly what to do with?

- NO  YES  Sometimes   
Don't know

- Q.47: WHY do you think solid waste dumped outside can be a problem?
- a) Attracts rodents and other animals
  - b) Insects (flies, mosquitos) can breed
  - c) Blocks Drainage Channels
  - d) Can attract snakes
  - e) Smells bad
  - f) Causes disputes between HHs
  - g) Looks unclean, untidy
  - h) Other \_\_\_\_\_

Q.48: Do you have pools or containers with stagnant water around your house?

- NO  YES   
Sometimes  Don't know what that is

- Q.49: What do you think can CAUSE DIARRHEA?
- a) Don't Know / Don't want to answer
  - b) Dirty Hands
  - c) Dirty / Unclean Water
  - d) Dirty Food

(you can circle more than 1 option)

- e) From Flies or other Vectors
- f) Dirty Environment
- g) Uncovered Food
- h) Other

Q.50: What time of the year is  
DIARRHEA a high risk?

- a) Don't know much about
- b) HOT Season
- c) Change in Season (HOT to RAINY Season)
- d) RAINY Season
- e) Change in Season (RAINY to COLD season)
- f) COLD Season
- g) Change in Season (COLD to HOT season)
- h) Other \_\_\_\_\_

Q.51: Do you think there is something that can prevent diarrhea?

Don't know                       YES                       NO  (go to Q.50)

Q.52: WHAT CAN BE DONE in the  
home to PREVENT DIARRHEA?

(people's opinion)

- a) Don't know
- b) Drinking clean water
- c) Eating clean food
- d) Handwashing with soap or ash
- e) Using Latrine
- f) Other

Q.53: What is the FIRST thing you do  
if a child in your household gets  
DIARRHEA?

- a) NO CHILDREN in the  
HOUSEHOLD
- b) Do Nothing
- c) Give coconut water
- d) Give the child EXTRA/MORE  
WATER than usual





Q.56: Does your community have a health worker who is available when you need help?

NO                                   YES                                   Sometimes   
Don't know

END of Questionnaire

ENUMERATOR OBSERVATION TABLE

	CLEAN	UNHYGENIC	MESSY	Other Notes
Living Room				
Kitchen				
Inside the house				
Around the house				
Toilet				

Is there waste (plastic, etc.) around the house?                  (1) YES                                   (2) NO

Did you see Animals inside the house (dogs, chicken, pigs):                  (1) YES   
(2) NO

Did you see animal faeces around the house:                  (1) YES                                   (2) NO

Do animals make a healthy impression?  
(1) YES                                   (2) NO                                   (3) Don't know

If the HH has a toilet, ask if you can use it and after that, try to wash your hands

- a) Nothing is available  
(no water bucket nor soap)
- b) Water only
- c) Water and Soap
- d) Ash
- e) Other \_\_\_\_\_

Other comments about this household:

THANK YOU FOR YOUR PARTICIPATION IN THIS STUDY