

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

**A STUDY ON KNOWLEDGE, ATTITUDE AND PRACTICE OF HYGIENIC
BEHAVIOR IN KAYIN STATE**

(Case Study: Thandaungyi Township)

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EMPA (16th Batch)

AUGUST, 2019

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(Case Study: Thandaungyi Township)**

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

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YANGON UNIVERSITY OF ECONOMICS
MASTER OF PUBLIC ADMINISTRATION PROGRAMME

This is to certify that this thesis entitled **“Knowledge, Attitude and Practice of Hygienic Behaviors in Kayin State, (A Case Study of Thandaunggyi Township)”** submitted as a partial fulfilment of the requirement for the Degree of Master of Public Administration, has been accepted by the Board of Examiners.

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ABSTRACT

Safe water, basic toilets and good hygiene are important to child survival and development. A lack of these inputs can affect the lives of many children in Myanmar at risk. The general objective of this study is to assess the level of knowledge, attitude and practice on water, sanitation and hygienic status of the mother groups of under-5 children. This study applies the descriptive method based on primary data collecting from the survey that covered a sample size of 294 households in Leiktho sub-townships in Thandaunggyi (North). It is found that awareness on contamination of water was quite low that none of the respondents could mention dirty hand and did not aware of human waste or animal waste as possible water contamination. It is found that awareness on diarrhea and dysentery that are associated with dirty/unclean water and contaminated food but poor awareness association between poor hygiene and diarrhea. Hand clean and latrines clean were not known as prevention for diarrhea by majority of the respondents although clean food and some extent to clean water were known to them. Moreover, the majority of respondents do not think about diarrhea is a major illness and life threatening disease other than dengue fever and malaria.

ACKNOWLEDGEMENTS

First and foremost, I would like to express my deep gratitude to Master of Public Administration Programme, Yangon University of Economics for providing me with the great opportunity to undertake this thesis paper. I would like to convey my sincere thanks to Professor Dr. Tin Win, Rector of Yangon University of Economics, Professor Dr. Ni Lar Myint Htoo, Pro-rector of Yangon University of Economics, for providing all necessary facilities to the students.

I also wish to offer my sincere thanks to Professor Dr. Kyaw Min Htun, Pro-Rector (Retired) of Yangon University of Economics, Professor Dr. Phyu Phyu Ei, Programme Director of Master of Public Administration Programme and Head of Department of Applied Economics and Daw Khin Chaw Myint, Associate Professor (Retired) for their advices and support to complete this thesis.

My gratitude also goes to my supervisor, Daw Khin Thandar Hlaing, Lecturer of Yangon University of Economics for her patience, detail guidance, supervision and constructive advices.

I also would like to express my appreciation to all professors, lecturers, and teachers who have dedicated their time and life for sharing their knowledge and experiences. I would like to thank to all faculty members, visiting lecturers and all classmates, alumni of Master of Public Administration Programme, Yangon University of Economics.

I am very thankful to the UN agencies, INGOs, and NGOs working in Kayin State for their invaluable support with my thesis. I am much indebted to the mothers of under 5-children who kindly participated in the survey and interviews and enumerators. Finally, I would like to give my earnest thanks to my family, friends, and colleagues from Mercy Corps for their support and encouragement.

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LIST OF ABBREVIATIONS

ARI	Acute Respiratory Infection
DALYs	Disability-Adjusted Life Years
ESAR	Eastern and Southern Africa Region
HIV	Human Immunodeficiency Virus
INGOs	International Non-Governmental Organizations
JMP	Joint Monitoring Program
KAP	Knowledge, Attitude and Practice
MDG	Millennium Development Goal
MIMU	Myanmar Information Management Unit
PONREPP	Post-Nargis Recovery and Preparedness Plan
PPPHW	Public-Private Partnership for Hand Washing
SDGs	Sustainable Development Goals
TCG	Tripartite Core Group
UNHABITAT	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation and Hygiene
WCAR	West and Central African Region
WES	Water, Environment and Sanitation
WHO	World Health Organization
WTG	Water and Sanitation Thematic Group

CHAPTER 1

INTRODUCTION

1.1 Rationale of the Study

Hygiene is commonly known as cleanliness or conditions and practices that serve to improve or maintain health. Improved housing, improved nutrition and improved hygiene with improved access to safe water, sanitation and good hygiene (WASH) are the essential components for the war against infectious diseases and foundation for clean environment, socio-economic development and good public health.

In many countries there endures a high prevalence of water and sanitation related diseases, causing many people, children in particular, to fall ill or even die. Lack of safe water, sanitation and adequate hygiene contributed to the leading killers of children under five, including diarrhea diseases, pneumonia, neonatal disorders and under nutrition. Every one of these children is a unique individual whose rights are imposed and whose health is scared from birth by the lack of access to safe drinking water and basic sanitation. Improved hygiene practices are crucial if transmission routes of water and sanitation related diseases are to be removed. The simple act of hand washing can have important implications for children's health and survival, by reducing morbidity and mortality related to diarrhea, pneumonia and other infectious disease. Proper hygiene education can Hygiene is commonly known as cleanliness or conditions and practices that serve to improve or maintain health. Improved housing, improved nutrition and improved hygiene with improved access to safe water, sanitation and good hygiene (WASH) are the essential components for the war against infectious diseases and foundation for clean environment, socio-economic development and good public health.

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Lack of safe water, sanitation and adequate hygiene contributed to the leading killers of children under five, including diarrhea diseases, pneumonia, neonatal disorders and under nutrition. Every one of these children is a unique individual whose rights are imposed and whose health is scared from birth by the lack of access to safe drinking water and basic sanitation. Improved hygiene practices are crucial if transmission routes of water and sanitation related diseases are to be removed. The simple act of hand washing can have important implications for children's health and survival, by reducing morbidity and mortality related to diarrhea, pneumonia and other infectious disease. Relevant hygiene education can draw an intention to change hygiene behavior; however, for most hygiene behaviors needed appropriate water and sanitation facilities to let people in transformation into real change.

Clean water, sanitation and good hygiene (WASH) have a great impact on socio-economic development and stability. Domestic water availability and sanitation are essential requirements for human life. Without water, life cannot be extended beyond a few days and the lack of access to adequate water supplies leads to the transmission of disease. Inadequate sanitation has negative impact on the most vulnerable segments in society; women, children, marginalized communities and nation as a whole.

Hygienic sanitation facilities are crucial for public health. The disease burden from unsafe water, sanitation and hygiene (WASH) is estimated at the global level taking into account various disease outcomes, principally diarrhoea diseases. Around 842,000 people from developing countries die as a result of inadequate water, sanitation and hygiene each year representing 58% of total diarrheal deaths. Diarrhea remains a major killer of children and Open air defecation perpetuates a vicious cycle of diseases and poverty. Countries where open air defecation is most widespread have the highest number of deaths of children under 5 years of age. (Chaulagain, 2018)

Clean water, basic toilets and good hygiene practices are crucial for the survival and development of children. Today, there are around 2.4 billion people who do not have improved sanitation, and 663 million who do not have access to improved water sources. The lives of millions of children are in danger without meeting the basic needs. Water and sanitation related diseases are one of the prime causes of death

for children under five. Every day, over 800 children die from preventable diseases caused by poor water, and a lack of sanitation and hygiene. (Chaulagain, 2018)

The risk contribution factors include the ingestion of unsafe water, lack of water due to inadequate hygiene, contact with unsafe water, poor personal and domestic hygiene and agricultural practices and inadequate development and management of water resources or water systems. It is obvious that to reduce infant and child mortality, improve quality of life and reduce poverty, greater efforts and investments are needed to increase safe water, affordable hygienic sanitation and adequate hygiene promotion. Simply, having sanitation facilities promotes health well-being and economic productivity. (Dwivedi P, Sharma A.N., 2007)

Inadequate and unsafe water, poor sanitation and unsafe hygiene practices are main causes of the diarrhea. Diarrhoea disease, nearly 90% of which has been attributed to suboptimal water, hygiene and sanitation is one of the largest causes of morbidity and mortality in children under five years of age in low and middle-income countries, where it kills more children than HIV, malaria and measles combine. (Gokul Pathak and Manisha Chalise, 2015)

Water, sanitation and hygiene are also linked to many other diseases that kill children or stunt their development, including helminth infections, trachoma, cholera, fluorosis and arsenicosis. There is also developing evidence associating better hand-washing practices with reduced incidence of acute respiratory infections.

It was found that worldwide, 5.3% of all deaths and 6.8% of all disability-adjusted life years (DALYs) are caused by poor sanitation, poor hygiene and unsafe water. A significant proportion of deaths can be prevented through safe drinking water, adequate sanitation, hygiene, immunization, proper infant feeding and enabling environment. Early childhood is the most critical phase for overall development throughout the lifespan. Individual sanitation practices are often learned in the early years of one's life from the family and community followed after family members; friends, and other community members such as care takers, teachers, and parents. Therefore, interventions in the first five years of life can have a great impact on the prevention of childhood morbidity and mortality. (Khanuja, 2018)

Myanmar is one of the impoverished countries in the world. Much of populations are without access to safe water and sanitation and waterborne diseases are a major cause of illness and death, especially amongst small children. Malaria, tuberculosis (TB), diarrhea, dysentery, ARI, abortion and psychosis are the common diseases occurred in Kayin State. Home drugs are scarce and expensive in township's remote villages. The underlying causes of disease incidences are due to weather, personal Hygiene and sanitation. Health infrastructure such as sub-rural health center is needed in most of villages in Kayin State.

Due to remoteness, some rural villages in Kayin State have poor or lack of access to awareness and knowledge of health and consequently frequencies and morbidity rates of some communicable diseases particularly diarrhea, dysentery and malaria diseases were high every year.

Children suffer the extreme health burden associated with poor water and sanitation. Younger the age more proneness for diarrhea; presence of under-five sibling in the family, birth weight are also factors to be considered while evaluating a child with diarrhea. A positive association between low socioeconomic status, poor maternal literacy, inadequate breastfeeding, malnutrition, poor sanitation and hygiene practices of the mother are associated with a higher incidence of diarrheal diseases in young children.

Mothers are the immediate and reliable care-givers of the children and their knowledge and practices on Water, Sanitation and Hygiene (WASH) have a strong influence on the occurrences of diarrheal diseases. It was attributed by World Health Organization (WHO) that 90% of all diarrheal diseases under-five children are due to mothers' unhygienic practices and poor sanitation. (WHO, 2014)

It can be expected that with better understanding of the disease and preventive measures, complications can be minimized. Thus, the study targets to the mother groups of children under-5 years of age because the diseases associated with water, sanitation and hygiene are the leading causes of under-5 mortality and morbidity and the mothers are directly linked with the child's health as they are the ones who take care of their children.

1.2 Objectives of the Study

The objective of the study is to assess the level of knowledge, attitude and practice on water, sanitation and hygienic status of the mother groups of under-5 children and caregivers.

1.3 Method of Study

This is a descriptive method study based on the knowledge regarding WASH among the mothers with under 5- children at rural mountainous areas of Thandaunggyi Township (North) in Kayin State and purposive sampling by collecting quantitative data with structured questionnaires. The secondary data were collected from reports, journals and various internet web-sites.

There are 39 questions in the questionnaire. It has four sections in the questionnaire which consists of general information in section A, knowledge on water access and use in section B, knowledge, attitude and practice on sanitation in section C and KAP related to hygiene in section D. A total of (294) mother with under-5 child or caregivers interviewed for this study.

1.4 Scope and Limitations of the Study

The study was conducted in 9 village tracts from sub-township of Leik Tho, Thandaunggyi Township by surveying mother group of under-5 children of the selected areas who is most responsible for domestic chores in the household such as cooking, fetching water, disposing the refuse, preparing food for the household members, taking care of the children such as feeding children, cleaning child's bottom and giving care during sick etc. Since the women are the most responsible person for the domestic chores and they are the primary care takers in most of the households in Myanmar, the major respondents are the women.

1.5 Organization of the Study

This study is organized by five chapters. Chapter 1 introduces with sub-topics; rationale of the study, the objectives, method of study, scope and limitations of the study and organization of the study. Chapter 2 studies the literature review and it includes the definitions and theoretical concepts. Chapter 3 presents an overview of

Water Sanitation and Hygiene in Global Scenario and status of Water Sanitation and Hygiene in the context of Myanmar. Chapter 4 is the analysis on the Knowledge, Attitude and Practice (KAP) on water and sanitation, health and hygiene practices among the mother groups of under-5 children in Kayin state. Finally, Chapter 5 which is conclusion of the study with findings and recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1 Health and Hygiene

Health is a certain state of well-being, where every part of the body and mind is in compatibility and in proper functioning balance with every other part. In other words, when every organ of the body is working regularly, the state of physical well-being is known as health. It has been well said that only that person can be called really healthy who has a healthy mind in a healthy body. Health is the essential of life that allows a person to live longer. According to World Health Organisation (WHO): “Health is the state of complete physical, mental, spiritual and social well-being and not merely absence of disease”. (WHO, 2006) Health is the hub of sustainable development: health is a factor of development, at the same time, development brings about better health. In this sense, greater synergies between health and other sectors will have huge impact on progressing health and well-being as well as sustainable development.

Hygiene is a critical component of healthy living, In fact, Hygiene is fundamental to achieving good health and impeding disease and infection. Not just having the right food choices but also cooking & consuming them in a hygienic way is equally vital in the infectious diseases prevention. Adopting hygienic practices and promoting hygiene in the community, schools and workplace prevents many infectious diseases.

Infectious diseases and diarrhea in particular, are the main determinants of wasting and stunting of growth in children in developing countries. Low child mortality and high levels of water and sanitation provision are correlated. The recent studies suggest that hand washing with soap may help reduce the incident of childhood pneumonia, as well as diarrhea, in the developing world. Under nutrition, which is associated with more than half of all under-five deaths, is closely linked to

diarrhea. Careful and hand washing is recommended, too, as a means of preventing the transmission of avian influenza, among other infectious diseases. (UNICEF, 2006)

The transmission routes of viruses, bacteria and any infectious disease producing agents cause diarrhea into human body. The contamination by human feces transferred to food, which is then consumed by humans. With these descriptive pathways of transmission routes, several preventive models have been developed. The most effective ways of reducing disease transmission is blocking the routes. This can be done by washing hands with soap after defecation or after cleaning child's bottoms, after their defecation and constructing sanitation facilities which can prevent the spread of disease by flies and the contamination of drinking water, fields and floors. For the best hygiene practice, hand, food, water and latrine cleans are very important. Four cleans can prevent diarrhea, avian flu and other water-borne related diseases.

Clean water is a vital role for human needs, and one that should be easily accessible to all. There is adequate fresh water on the planet to attain this. However, due to not enough infrastructure, investment and planning, every year millions of people-most of them children-die from diseases related with poor water supply, sanitation and hygiene. Many people still distress access to safe water supplies and sanitation facilities. Shortage of water, flooding and lack of proper wastewater management also deter social and economic development. Improvement in water efficiency and water management are important to balancing and growing the needs of water from various sectors and users.

Development of community water supplies and sanitation causes in social and economic conditions improvement and better health. The advantage of improved water supply and sanitation are many, including prevention of disease, improved basic health care, better nutrition, increased access to institutions such as health centers and schools, improved water quality, increased quantity of access water, reduction in time and effort required for water collection, promotion of economic activity, strengthening of community organization, improvements in housing and ultimately, improved quality of life. The requirements for domestic water supplies for basic health protection go above the minimum requirement for consumption (drinking and cooking). (SugritharanM, 2016)

The new global goals for development, the Sustainable Development Goals have the potential to change this and deal with the particular opponent across water, sanitation and hygiene around the world. The Sustainable Development Goals (SDGs), otherwise renowned as the Global Goals, are a collective call to action to end poverty, safeguard the world and ensure that all people enjoy peace and success. SDGs are a landmark agreement following on from the Millennium Development Goals (MDGs). This universal agenda sets ambitious standards to tackle extreme poverty, inequality and climate change and will guide governments and international development actors in their work from 2016-2030. (UN, 2017)

The establishment of SDG 6, Ensure availability and sustainable management of water and sanitation for all, clearly reflects the increased attention on water and sanitation issues in the global political agenda. (UN, 2017) Sustainable Development Goal 6 has the two targets:

Target 6.1 By 2030, achieve universal and equitable access to safe water and sanitation for all. (UN, 2017)

Target 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. (UN, 2017)

It also contributes and interconnected with SDG 1 “to end poverty in all its forms everywhere” and “to SDG 4 to ensure inclusive and equitable quality education and promote effective learning opportunities for all” by giving statistical data on basic water, sanitation and hygiene for the following targets: (UN, 2017)

Target 1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services. (UN, 2017)

Target 4.a: Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all. (UN, 2017)

Safe water, sanitation and hygiene are also necessary for SDG 3 “Ensuring healthy lives and promote wellbeing for all at all ages”. Under SDG target 3.9,

countries are engaging to substantially reduce the number of deaths and illnesses from dangerous chemicals and air, water and soil pollution and contamination by 2030. Additionally, safe water, sanitation and hygiene are necessity to lessen maternal mortality and to terminate preventable deaths of newborns and children as called for in SDG targets 3.1 and 3.2. (UN, 2017)

Improving the access to safe drinking water and adequate sanitation, as well as promoting good hygiene, are key components in the prevention of diarrhea. It also indicated that access to adequate sanitation reduced the incidence of disease and brings relative comfort and ease to the daily routine of toilet use, thereby enhancing the quality of life. (Sibiya JE and Gumbo JR, 2013)

2.2 Water, Sanitation and Hygiene (WASH)

WASH typically make reference to activities aimed at improving access to and use of safe drinking water and sanitation as well as developing good hygiene practices (e.g. handwashing with soap at critical times). Poor access to safe water and sanitation services, set with poor hygiene practices, threatens to death and leads thousands of children sickness every day, and leads to deplete and lessen opportunities for thousands more. (Kyaing, 2010)

Water quantity is defined by provision of facilities and services that increase the amount of water available for drinking, cooking and maintaining good hygiene practices with households, health care facilities or schools; and reduce the time and effort required to collect the water. Water quality is defined by improvement and protection of the microbiological (or chemical, such as arsenic) quality of drinking-water through water treatment and safe storage by improving existing water sources to protect them from outside contamination. Improved water sources include piped water on-site, public taps or standpipes, tubewells or boreholes, protected dug wells, protected springs and rainwater. (WHO and UNICEF, 2015)

Sanitation is the provision and use of facilities and services that safely dispose of human urine and faeces, thereby preventing contamination of the environment. Improved sanitation facilities as defined by the aforementioned Joint Monitoring Program (JMP) are those that hygienically separate human excreta from human

contact and include flush or pour-flush toilets to piped sewer systems, septic tanks or pits, ventilated improved pit latrines, pit latrines with slab and composting toilets. (WHO and UNICEF, 2015)

Hygiene is practice of hand washing with soap after defecation and disposal of child faeces, prior to preparing and handling food, before eating, and, in health care facilities, before and after examining patients and conducting medical procedures. Hygiene is also refers to interventions such as food hygiene (safe food handling, including preparation, storage and serving) and environmental hygiene such as safely disposing of household solid waste. (Adams, Bartram and Chartier, 2008)

There are five clusters for hygiene practices are important for behavior change. Sanitation hygiene practice, water hygiene practice, food hygiene practice, environmental domestic and environmental hygiene practices can prevent diarrhea, pneumonia and other infectious diseases of children and adult.

2.3 Importance of WASH

Water supply and sanitation coverage is an important poverty issue: when consulted, people affected by poverty consistently identify safe water as a high development priority. However, access to improved sanitation services less demand and thus present a greater challenge to increase coverage. Furthermore, the range and extent of impacts from water and sanitation interventions point to its critical role in several areas: poverty eradication, the environment; quality of life; child development and gender equity among others.

Lack of water and sanitation has profound effects on the health of the world's people. The elderly are more susceptible to and more likely to die from diseases related to water, sanitation and hygiene than other adults. The numbers of elderly people in many populations are increasing, in both developed and developing countries. Countries making this transition will need to consider the special needs of the elderly when developing drinking water and sanitation programs. For men, inadequate drinking water and sanitation means that less energetic and so get less paid resulting in more illness. For women and girls, the penalties are typically much more severe. Children and particularly girls are denied their right to education due to busy

schedule of fetching water and lack of separate and decent sanitation facilities in schools. For immune compromised people living with HIV/AIDS, their state makes it imperative to have a safe and adequate supply of water for drinking and personal care. Farmers and daily labors are less productive due to illness, and national economies are impaired. (WHO and UNICEF, 2005)

Lack of basic sanitation prevails illness as a life without dignity. Simply, having access to and using sanitation facilities increase health, well-being and economic productivity. Inadequate sanitation has a negative impact on individuals, households, communities and countries.

Improved water and sanitation facilities and better hygiene behavior will radically reduce illness. In addition, greater access to water and sanitation services has many other benefits include saving of health-related costs, efficient time for daily activities and time saved by having water and sanitation facilities closes to home. This may turn into a greater positive impact towards economic and social both immediate and future such as higher productivity, higher school attendance and more recreation time. Sustainable development is unattainable if there is no safe water and sanitation.

2.4 Sectorial Relations to WASH

The essential inputs that the WASH sector provides, in the form of services and hygiene promotion, have multiple impacts beyond the WASH outcome itself, such as livelihood, education and health. Furthermore, these far-reaching effects of WASH can be felt beyond the immediate impact, can have a cumulative effect throughout the life course of an individual, and can often also affect the lives of their offspring. The contributions of WASH to outcomes in other sectors are described in following.

2.4.1 Livelihoods and WASH

Inadequate access to WASH caused the disease and troubled in taking time for many adults by means of earning a living or fulfilling their potential in the professional arena. Proper functioning in WASH frees up not only adults also women in providing sufficient time to do more productive activities, plus, create employment opportunities. (UN WATER, 2018)

Indeed, access to WASH helps drive progress towards the SDGs concerned with poverty, work and economic growth, not least because it will help achieve gender equity. It is women and girls who suffer the burden of collecting water and caring for relatives made sick by lack of WASH, and who often miss out on education due to the domestic roles assigned to them. Lack of WASH deteriorates the marginalization of females by locking them into a cycle of poverty and drudgery, with wider consequences for society and national economies. (UN WATER, 2018)

2.4.2 Education and WASH

School and childhood should go hand in hand, but many children in low-income communities with no access to WASH are unable to attend class because children are sick with a diarrhoeal disease or, particularly in the case of girls in rural areas, because girls have to spend large parts of each day fetching water for their family. (UN WATER, 2018)

For children who are in school, the situation may be no better than at home: globally, around a third of schools have no safe water supply or adequate sanitation, leaving children dehydrated and less able to concentrate, and forcing pupils to use inadequate latrines or go to the toilet outside in the school grounds. (UN WATER, 2018)

For adolescent girls, the presence of a safe water supply and clean, functioning, private toilet facilities can be the difference between dropping out and getting an education. Furthermore, hygiene education at school can begin a lifetime of better health for all children. (UN WATER, 2018)

2.4.3 Health and WASH

Universal access to WASH has an impact on global health. There is the potential to save the lives of the 840,000 people who currently die every year from diseases directly caused by unsafe water, inadequate sanitation and poor hygiene practices, and it could also drastically reduce child malnourishment, and help alleviate physical and mental under-development. (UN WATER, 2018) Today, 50% of child malnutrition is associated with unsafe water, inadequate sanitation and poor hygiene. (UN WATER, 2018) Women and girls would have the facilities and knowledge to be

able to manage their menstrual cycles in safety and dignity. Similarly, during pregnancy, childbirth, and post-natal care, medical staff, expectant mothers and their families is better equipped to ensure newborn children are given the safest and healthiest possible start in life. (UN WATER, 2018)

In developing countries where women do most of water collecting, these women are exposed to accidents like drowning, attack and assault at and from the water source; similarly, these women do also suffer from skeletal injuries caused by carrying heavy loads repeatedly over long periods of time.

2.5 Status of Water, Sanitation and Hygiene in Global Scenario

Globally, improving drinking water condition and sanitation facilities persist a major concern status. There has been considerable progress in the Water, Sanitation and Hygiene (WASH) sector since 1990, the MDG baseline year. (UNICEF, 2013) The global population using an improved sanitation facility has increased from 54% in 1990 to 68% in 2015 which is a net increase of 2.1 billion people. (Daudey, 2018) However, achievements are far below the Millennium Development Goal (MDG) 2015 target of 77%. Worldwide, almost 748 million people still rely on unimproved sources of drinking water, almost a quarter of which rely on untreated surface water and 2.5 billion people lack access to improved sanitation including one billion were no use of latrines. (Daudey, 2018)

A large fraction of the world's illness and death is considered as the causes due to communicable disease. 62% and 31% of all deaths in Africa and Southeast Asia, respectively, are caused by infectious disease. (Vivas, Gelaye, Abose, Kumie, Berhane and Williams, 2010) This trend is especially remarkable in developing countries and poor in sanitary conditions and hygiene practices play the main roles in increasing burden of communicable disease. Previous hand hygiene studies have shown that proper hand washing practices prevent gastrointestinal and respiratory symptoms. Hand washing with soap has been reported to reduce diarrheal morbidity by 44% and respiratory infections by 23%. (Vivas, Gelaye, Abose, Kumie, Berhane and Williams, 2010) However, globally, the rates at which hands are washed with soap range from only 0-34% of the time. (Vivas, Gelaye, Abose, Kumie, Berhane and Williams, 2010)

Diarrhea disease is one of the largest causes of under five children morbidity and mortality in low and middle-income countries, especially it kills more children than HIV, Malaria and measles. Out of 2.5 billion diarrheal cases occurring every year among under-five children, more than half occur from Africa and Southeast Asia. The total death toll due to diarrhea is about 1.5 million every year globally. (Joshi A, Prasad S, Kasav JB, Segar M and Singh Ak., 2014)

WHO estimates that inadequate sanitation causes around 280,000 deaths annually and is a major factor behind some tropical diseases and malnutrition, which particularly affect children (WHO, Preventing Diarrhea through better Water, Sanitation and Hygiene: Exposures and Impacts in Low and Middle Income Countries, 2014). Inadequate sanitation also considerably undermines economic performance: for example, a recent study estimated that the global cost of poor sanitation reached USD 223 billion in 2015, up from USD 183 billion in 2010. In Africa, economic losses due to poor sanitation account for around 1-2.5% of GDP (Watt, Cheng and Mente, 2016).

Many studies have shown the positive results of reduction in illness through improvement of drinking water, sanitation and hygiene practices in developing countries. UNICEF report of 2013 indicated that, In 16 of the 23 countries in Eastern and Southern Africa region (ESAR), less than half of the population uses improved sanitation. (UNICEF, 2013) In seven of these countries, over one third of the population practices open defecation, with the rate as high as 77 percent in 2011 for South Sudan. With this, the number of people who practice open defecation rose from 97 million to 106 million but this still meant that the region succeeded in greatly lowering the rate of open defecation from 40 percent of the population 1990 to 25 percent in 2011. (UNICEF and WHO, 2013)

In West and Central African Region (WCAR), only 27 percent of people have access to improved sanitation. (UNICEF and WHO, 2013) In seven countries in this region, more than a half of the population defecates in the open. WCAR experienced massive population growth from 244 million to 423 million during 1990 and 2011. The number of people practicing open defecation increased from 77 million to 106 million in the region as a whole. (UNICEF and WHO, 2013) However, this still meant that the regional rate of open defecation lowered-from 31 percent of the population in

1990 to 25 percent in 2011. At the national level, Guinea and Senegal also achieved significant reductions in open defecation. (UNICEF and WHO, 2013)

The East Asia and the Pacific region has shown the improvement in progress in access to sanitation, with coverage increasing by 36 percentages (approximately 1,373 million people) now have access to improved sanitation facilities. (UNICEF, 2014) East Asia and the Pacific have low percentages in open defecation at an average of five per cent of the population. In South Asia 41 per cent of people continue to practice open defecation. (UNICEF, 2014) India is home to 615 million people who defecate in the open. In both India and Nepal, more than 40 per cent of the population practices open defecation. The overwhelming majority of those without access to sanitation facilities live in rural areas. (UNICEF and WHO, 2013)

2.6 Review 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.

Aung Kyaw Than (2008), conducted a thesis on the title of “A study on water and sanitation programme in Dala Township”. It was found that the volume of safer water available has increased significantly bodes for a decrease in water related disease and improvement of quantity and quality of water is effective obviously to the health of under 5 year children in Dala township. Coupled with the large-scale household sanitation and associated with health education, the rates of diarrhea disease have declined and the decrease in water born disease was cited as a health benefit. (Than, 2008)

Thu Rein Win (2012), conducted 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), conducted thesis on the title of “A study on awareness of water-borne diseases in Twantay Township”. In the study, it was found that almost all the respondents are quite aware of two well-known water-borne 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)

Md.Mamunur Rashid (2017) also made a comparative study on “Knowledge on Water, Sanitation and Hygiene Among the mothers of under-5 children in Bangladesh”. In the study, It was expressed that the child mortality considerably depends on the water, sanitation and hygiene practice of the mother’s group. The low profile of education and income status creates barriers in accessing proper knowledge on WASH and also practicing good hygiene in the family. Experience shows that hygiene, especially behavioral change, receives limited attention in traditional interventions. The success of any hygiene promotion effort involves changing habitual practices. Hand washing with soap or ash after defecation, before eating, after cleaning children’s bottoms, before feeding children and before serving food has a great impact on people’s health. (Md., 2017)

CHAPTER 3

OVERVIEW OF WATER, SANITATION AND HYGIENE SECTOR IN MYANMAR

3.1 Health and WASH Status in Myanmar

Myanmar (population 57 million) is a country of significant geographic and ethnic diversity. The country is a Union of 17 States and Divisions, and is made up of 135 national groups (mostly resident in the “States” on the western and northern peripheries of the country). (Asian Development Bank Myanmar, 2007) With a Gross National Income of \$270 per annum, Myanmar is rated 131 out of 177 countries on the most recent UNDP Human Development Index. (UNDP, 2008)

Myanmar is still developing country and the health care in Myanmar is still impoverished and ranked among the lowest in the world. The country’s GDP on health care expenditure was from 0.5% to 3% during 1962-2011 and was increased to 5.2% in 2017. As spending continue to rise, health indicators have begun to increase. Globally, the health care costs paid out of pocket were 32% and In Myanmar, the majority of health costs have to pay out by patients and it were reduced from 85% to 62% from 2014 to 2015. It continues to drop annually. (Anwar, 2007)

Both public and private hospitals are understaffed due to a national shortage of doctors and nurses. (Thwe, 2013) Public hospitals lack many of the basic facilities and equipment. Myanmar was consistently ranked the worst nations in health care by WHO and faces many challenges in meeting the health care needs of the population. (Thwe, 2013)

Myanmar has the lowest life expectancy at birth (at 66.61 years), and the second highest maternal mortality ratio (178 per 100,000 live births), under-five mortality (50.8 per 1,000 live births) and infant mortality rates (40.1 per 1,000 live births) in Southeast Asia / ASEAN member states. (Myanmar Health and Development Consortium, 2015) The health workforce (physicians, specialists,

nurses, technicians, etc.) is also over-burdened and remains below optimal coverage ratios, negatively affecting service delivery and quality. (UNFPA, 2014)

Myanmar is also experiencing a huge burden of both communicable and non-communicable diseases. While communicable diseases such as AIDS, tuberculosis, malaria, diarrhoea and dengue continue to remain major public health issues for seven of the ten main causes of death, and are responsible for 68% of all deaths. (UNFPA, 2014) These communicable disease problems are intensified by access to health system difficulties, particularly as affecting mothers and children in remote areas. Barriers in health care system includes limitations of health care human resources availability in rural and remote regions, financing of health care, and reduced accessibility due to geographic, infrastructure and security factors in some border areas.

The lack of basic WASH facilities hampers Myanmar's effort to reduce child and maternal mortality and illness; it also impedes efforts to reduce stunting which affects 32 per cent of children in rural areas and 20 per cent in urban centres. Women and girls face extra challenges, especially without private facilities during their periods. Though rural areas are most affected, Myanmar's fast-growing urban centres — magnets for migration — are also struggling to match the needs for water and sanitation. (UNICEF, 2018)

Inadequate facilities in schools contribute to lower attendance and achievement. Health facilities that lack proper sanitation infrastructure and training on infection struggle to provide quality services. Lack of knowledge about protecting oneself from the spread of disease also hampers people's ability to combat health threats. Myanmar faces many challenges in order to achieve national targets for WASH in line with the Sustainable Development Goals for 2030. (UNICEF, 2019) In addition, Myanmar's geography and climate conceive to the country's vulnerability to natural disasters and national infrastructure to safeguard health is still weak. Five million children have poor access to an improved water supply and 1.4 million children are without access to toilet facilities. (UNICEF, 2018)

3.2 National Strategy for WASH in Myanmar

The National Strategy for Rural Water Supply, Sanitation and Hygiene (WASH), in Schools and WASH in Health Facilities and associated Investment Plan are based on the findings of Myanmar Water, Sanitation and Hygiene Sector Situation Analysis(2014), Myanmar Population and Housing Census (2014) and also taking into account the changes occurred since then. Departments in three Ministries have cooperated in the development of the Strategy and Investment Plans: Department of Rural Development, Department of Basic Education and Department of Public Health, with support and input from other relevant Departments. The Departments worked together in a Task Force chaired by DRD. The process of developing the Strategy has been based on wide consultation with potential users of it: Union Government Departments; State and Region Government Departments; Township Government and civil society leaders; Development Partners; national and international NGOs. The contribution from all these consultations has been invaluable in developing a strategy relevant to all the needs. (Ministry of Agriculture, Livestocks and Irrigation, Ministry of Education and Ministry of Health and Sports, 2016)

The purpose of this strategy is to set out the way to meet the needs of the rural populations for improved domestic water supply services, access to and use of improved sanitation with elimination of open defecation, and improved hygiene behaviour by the Year 2030, the target date for achievement of the Sustainable Development Goals. It also addresses water, sanitation and hygiene in schools up to high school level and health facilities up to township hospital level. The strategy is supported by Investment Plans covering a financing period 2015 to 2030 in order to ensure sufficient funding for development and operation of services in accordance with the strategy. (Ministry of Agriculture, Livestocks and Irrigation, Ministry of Education and Ministry of Health and Sports, 2016)

The Strategy and Investment Plan covers safe water supply, sanitation and hygiene services in rural communities, schools, and health facilities including responses in emergency and humanitarian settings. The Strategy and Investment Plan set out a costed road map to meet the needs of rural populations for water and sanitation services eliminate open defecation and improve hygiene practices. It also addresses water, sanitation and hygiene in schools encompassing high schools, health

facilities and township hospitals. The Strategy and the Investment Plan contribute towards the achievement of the Sustainable Development Goals for Myanmar by 2030.

3.3 History and Development of the WASH sector

Prior to 1980 there was very little external engagement or NGO presence in the WASH sector in Myanmar. This began to change during the International Decade for Clean Drinking Water (1981-1990) during which a partnership developed between the Myanmar government and external agencies, notably UNICEF (which had been working in Myanmar in various other capacities since 1950) and the Asian Development Bank. During the 1990s and early twenty-first century more UN agencies became involved in providing water and sanitation services and a growing INGO presence also emerged in the sector. World Vision, Save the Children, Malteser and CESVI have all been present in Myanmar for ten years or more and their work has included many small-scale water and sanitation projects. UN agencies and INGOs initially focused very heavily on hardware provision to improve access to water, with far less emphasis upon sanitation, hygiene or community mobilization. (Meehan P, 2011)

The Water and Sanitation Thematic Group (WTG) was established in the late nineties to coordinate and improve the work of various UN agencies. Since 2001 bilateral agencies and INGOs have joined the group, which also became a platform to discuss technical challenges within the sector. Since 2005 there has been a growing interest in the sector regarding the importance of hygiene promotion and behaviour change facilitation, reflected by the fact that in 2007 UNICEF changed the name of the sector from Water, Environment and Sanitation (WES) to Water, Sanitation and Hygiene (WASH).

The government has sought to improve levels of hygiene through the Department of Health's long-running "Four Cleans" Initiative which aims to increase awareness about the importance of clean food, clean water, clean hands and clean toilets. (Meehan P, 2011)

The emergency response to Cyclone Nargis, which struck the country in 2008, had a profound impact on the development of the WASH sector. The Cyclone encouraged many organisations to consider working in the country. As a result there was a rapid growth in the INGO presence in the country with many INGOs focusing heavily on improving water and sanitation provision as part of their emergency response and the recovery phase that followed. Nargis also led to an equally rapid emergence of local NGOs, many of whom also heavily prioritised water and sanitation. (UNHABITAT, 2010)

The creation of the Tripartite Core Group (TCG), established by the UN, ASEAN and the Myanmar Government to manage the response to the disaster through the Post-Nargis Recovery and Preparedness Plan (PONREPP), also reflected the growing potential for better coordination between the government and external agencies. (Meehan P, 2011)

The WASH Cluster, which was used to co-ordinate the sector during the Nargis emergency response, has now merged with Water and Sanitation Thematic Group to form the WASH Thematic Group. This acts as a forum for UN agencies, local NGOs and INGOs to share information about how to develop WASH services across the country and has recently established sub-groups on Gender and Behaviour Change. (Meehan P, 2011)

3.4 Water, Sanitation and Hygiene Sector in Myanmar

Myanmar is one of the developing countries in the world. Much of the populations are without access to safe water and sanitation and waterborne diseases are a major cause of illness and death, especially amongst small children. Acute water shortages across parts of the country leave many communities extremely vulnerable and often forces households to borrow money in order to purchase water, locking them into a downward spiral of poverty.

In rural area of Myanmar, it usually obtain drinking water and water for day-to-day consumption from wells, springs, creeks, rivers or ponds and sometimes water sources are very far away from the village. Normally, the task of fetching water is determined the responsibilities of women and children. Sometimes these water

sources are drying up during the dry season and have to look for even alternative water sources which may be contaminated. When water is scarce, people are forced to drink dirty, contaminated water, thinking that safe water is a luxury they can ill-afford. Similarly the use of latrines is very uncommon in many areas of rural Myanmar. Knowledge of safe and hygienic practices and standards, especially outside the Delta, is also extremely limited. Many people do not make the connection between poor water quality and diseases; dirty hands and unsanitary waste disposal perpetuate the cycle of disease and poverty. (Tripartite Core Group, 2010)

Water, sanitation and hygiene are fundamental to child survival and development. However, in Myanmar, 29% of children (nearly 5 million) live in households that do not drink from improved water sources. In addition, 25% of children (over 4 million) live in households that do not use improved toilet facilities and 14% (2.34 million) live in households with no access to toilets. (UNICEF, 2006)

The 2014 census also reveals significant geographic disparities in access to WASH facilities between urban and rural areas. While 74% of households nationwide have improved sanitation facilities, in rural areas this number decreases to just 67%, and 19% practice open defecation. Nationwide 70% of households have access to an improved water source, whilst in rural areas the figure is only 62%. (Ministry of Immigration and Population, 2014)

3.4.1 WASH Coverage

Water, Sanitation and Hygiene sector coverage in Myanmar are described as following.

3.4.1.1 Water Supply

Myanmar has a tropical climate with three seasons: the monsoon or rainy season, from May to October; the cool or winter season, from November to February; and the hot or summer season, generally from March to April. Rainfall during the monsoon season totals more than 500 cm (200 in) in upper Myanmar and over 250 cm (100 in) in lower Myanmar and Yangon (formerly Rangoon). Central Myanmar, called the dry zone, and Mandalay, the largest city in this area, each receive only about 76 cm (30 in) per annum. (Meehan P, 2011)

Communities' source of water varies with the topography of the country. Throughout lowland Myanmar rain fed ponds form the backbone of water supply and an estimated 65-70% of Myanmar's populations are reliant upon rainfall collection, either in ponds or rain water collection tanks. Many rural communities have access to a number of ponds within their local vicinity which are used to collect water during the rainy season and then provide a source of easily accessible water throughout the rest of the year. The heavy reliance upon rainfed ponds creates two major weaknesses. (Tripartite Core Group , 2010)

Across large parts of Myanmar (especially the Delta and the Dry Zone) existing ponds are unable to collect sufficient water during the rainy season to cope with demand for water throughout the rest of the year. This creates acute water shortages in the final months (March to May) before the year's monsoon rains arrive. (Meehan P, 2011)

A combination of very high temperatures, late monsoon rains and saline contamination of many existing ponds following Cyclone Nargis in 2008 meant water shortages were especially acute during the 2010 dry season and demonstrated that rural water supplies throughout much of the country were extremely vulnerable. Indeed, the Post-Nargis Periodic Review 3 found that only 35% of households surveyed in Ayeyarwady Division had access to at least three litres of drinking water a day in the rainy season and this fell to only 15% during the dry season. (Tripartite Core Group , 2010)

Water quality in many ponds is extremely poor. Very few ponds are fenced off or have pontoons meaning they are easily contaminated by animals and people that use them. Following Cyclone Nargis, many NGOs have attempted to improve water supply across the Delta by constructing new ponds and rehabilitating existing ponds in order to improve the region's storage capacity. Efforts have also been made to improve the quality of pondwater by constructing fencing around ponds, constructing handpumps to deliver water from the pond and thus reduce contamination by people collecting water directly from the pond, cultivating grass on pond embankments to reduce soil erosion and by encouraging households to filter, boil or chemically treat pond water before drinking it. (UNHABITAT, 2010)

Tubewells have been constructed by the government and NGOs across the Delta, the Dry Zone and Rakhine State. Tubewells often provide a cleaner and safer source of water than ponds and shallow wells and can reduce reliance upon rainfed ponds. Over the past decade dangerously high levels of arsenic have also been discovered in many of Myanmar's shallow aquifers (notable across the Delta Region, Rakhine state and Southern Shan State) again raising concerns about the safety of groundwater collected by tubewells.

A number of NGOs are currently trialing solar-powered pumping systems. Solar power used to pump water from underground to a high tank where the water is stored. In many areas of upland Myanmar highland water springs and the streams and tributaries they feed are the most common water supply. Unlike in lowland Myanmar, where ponds are close to communities, upland water sources are more likely to be some distance away and less easily accessible. (UNHABITAT, 2010)

Most cities have small piped networks that serve central areas and richer neighbourhoods. Outside of this network access to water varies from one neighbourhood to the other with ponds, handpumps and some tubewells being the major sources of water. Many households purchase water from water vendors who collect water from these sources and deliver it directly to the household.

3.4.1.2 Sanitation

There are currently no reliable statistics regarding access to improved sanitation in Myanmar. The WHO/UNICEF Joint Monitoring Programme for water supply and sanitation claim that 86% of the urban population and 79% of the rural population have access to improved sanitation and also claim that there only 1% of the rural population practice open defecation (with the practice non-existent in urban areas). (UNICEF, WHO, 2010)

Knowledge, Attitude and Practice (KAP) reports compiled by some NGOs, the prevalence of open defecation vary hugely across the country. There is extensive latrine coverage across the Delta and in other areas of the country; open defecation is an almost universal practice in Northern Rakhine State where latrine coverage is estimated to be less than 5%. (Meehan P, 2011) Many households have latrines few are actually sanitary. Many are not fly-proof, are close to water sources, are

vulnerable to flooding during the rainy season and waste is often not properly washed down into the pit below. Latrines are generally unpopular due to their smell and lack of comfort. The smell often causes households to build them as far away as the main house as possible discouraging their use during bad weather and at night. (Meehan P, 2011)

Households that are in extreme poverty or are female-headed struggle to afford the materials or have the manpower required to build a latrine, or because the elderly or children are reluctant to use them, or because some individuals prefer to defecate in the open. There are very limited sanitation facilities during the day for those who farm land some distance away from the house. (UNICEF and WHO, 2013)

3.4.1.3 Hygiene and behavior change

Improving levels of hygiene in Myanmar remains a major challenge. Poverty plays a major role in why households fail to adopt safer practices. Very limited access to water and sanitation services, limited supply of basic materials such as soap and insufficient financial resources to afford the materials required to construct sanitary latrines are the limited scope to adopt better hygiene. The lack of any organized garbage disposal system in many areas also results in a common tendency to dump waste in rivers even though many households are aware that this is unhygienic. (Meehan P, 2011)

WASH related hygiene behaviors often carry strong moral connotation. It should be recognized that for many of the risk practices around hand washing a similar prevalence to that found in study area has been observed and people value cleanliness as a cultural norm. Nevertheless, many people are at present forced to live in conditions that combined poverty with poor water and sanitation infrastructure and poor access to health services. Under these conditions reducing the prevalence of the risk factors observed has the potential to reduce infection and lengthen the life of children. The critical risk practices to be addressed are not washing hands with cleaning agent after likely fecal contact, not disposing off of under 5 age child's feces into latrine, washing foods with river water and dispose excreta and household waste into river or creek. The pleasant sensation and smell of soap and unpleasant and socially unacceptable sight and smell of feces are possible motivations for adopting

safer practices. It is interesting to reflect on the facts that more than 30 years of instructive hygiene education provided by health authorities and several respondents has apparently failed to produce sustainable adoption of safer hygiene practices. (Win, 2012)

Some NGOs cited that the weaknesses in knowledge about hygiene, especially in more remote areas of the country includes the belief that using soap to wash hands is only necessary when hands are noticeably dirty, sticky or smelly, the belief that children's faeces are harmless and therefore do not need to be carefully disposed of, the belief that 'raw' or untreated water is natural, fresh and uncontaminated, or that letting water settle is enough to treat it. This belief is particularly common in instances where water has no turbidity, the belief that open defecation is harmless, practical, and more natural and safer than using latrines, which are often perceived to be dirty due to the fact that they collect waste in a single place. (UNHABITAT, 2010)

3.5 WASH Policy and Institutional Environment

The government has a National Health Policy (1993) and a National Environment Policy (1994) but neither of these provides a specific water and sanitation policy nor do these policies set standards for water quality. There are some limited statutory laws regarding urban water supply but there is no specific policy and legislative framework for rural WASH. The National Water Policy has one section on domestic water supply and sanitation, but only one paragraph of that addresses rural needs. Importantly, however, the National Water Policy does set the top priority for allocation of water resources for domestic use. The National Framework for Economic and Social Reform sets some general policy direction which is relevant for WASH. There is currently a plan to develop a Water Law which is important to influence this so that it is relevant to rural domestic water supply and sanitation.

There is no single institutional home for WASH and responsibilities for WASH provision are divided between numerous ministries including: Agriculture and Industry, Health, Education, Forestry, Development Affairs and the Yangon, Mandalay and Naypyidaw City Development Council.

CHAPTER 4

SURVEY ANALYSIS

4.1 Survey Profile

In order to fulfill the objective of this study, this chapter, mainly described the analysis on the KAP on water and sanitation, health and hygiene practices among the mother groups of under-5 children in Leiktho subtownships, Thandaunggyi Township (North) in Kayin State. Kayin state is formed of 4 districts, 7 townships and 458 villages with 30,383 sq. km area of land. The lowland areas, especially in the west, practice rice farming. In the east, many areas are hilly and covered with forests, with people practicing upland farming. The rocky Dawna Mountain range runs along the length of Kayin state in the east, and the southern and western parts of Kayin state, particularly around Hpa-An area. The area was previously known as Karen State, and is mainly inhabited by Karen ethnicities, which are also known as Sagaw Karen, Pwo Karen, Bwe Karen, Paku Karen, and other ethnicities, such as Mon, Shan, Burmese, and Pa-O. In Kayin State, it is 84.5% Buddhist, 9.5% Christian, 4.6% Islam, 0.6% Hindu, 0.1% Animist, 0.7% other religion and less than 0.1% for no religion. (Myanmar National Population and Housing Census, 2014)

Kayin State lacks railway infrastructure. The main rail line is only linked to the closest town in Mon State. The airport in Hpa-An and Pha-pun are rarely used for domestic and international flights. According to Myanmar National Population and Housing Census 2014, the total population is about 1,504,079 in Kayin State and about 30,309 lives in Thandaunggyi township (Ministry of Immigration and Population, 2014). For the population in urban and rural areas, the census results showed that for every 100 persons, 78 persons lived in rural areas while 22 persons live in urban areas. Urban and Rural residence in Thandaunggyi township, the majority of the households mainly use motorcycle as a means of transport. (Ministry of Labour, Immigration and Population, 2017)

The proportion of households with improved sanitation facilities in Kayin State is 68.9%. About 11.2% of the households in the Thandaunggyi Township have no toilet facilities. For the entire Kayin State, it is 24.5%. In the rural areas of Thandaunggyi Township, 17.5% of the households have no toilet facilities. In Thandaunggyi Township, 49.5 percent of households use improved sources of drinking water (tap water/piped, tube well, borehole, protected well/spring and bottled water/water purifier). About 27.5 percent of the households use water from river, stream, canal and 25.4 percent use water from tap water, piped. About 50.5 percent of the households use water from unimproved sources. In rural areas, 66.4 percent of the households use water from unimproved sources for drinking water.

The infant and Under 5 mortality rates in Thandaunggyi Township are higher than those in Kayin State and Hpa-An District. The Infant mortality in Thandaunggyi is 62 per 1,000 live births and Under 5 mortality is 71 per 1,000 live births. Major health facilities available in Kayin State are one 200-bed State hospital in Hpa-an, two 100-bed hospitals, two 50-bed district hospitals, four 25-bed township hospitals, nine 16-bed sub-township hospitals, eleven 16-bed station hospitals. Besides, the government established 56 rural health centers (RHCs) and 16 RHCs, which are the annexes of the station hospitals. In addition, there are a number of health centers such as 250 sub-RHCs, 1 urban health center, 1 school health center, 1 mother and child health center, 2 sexually transmitted diseases center and 3 Tuberculosis disease centers for providing health care service to the public of Kayin State.

4.2 Survey Design

The survey used simple random sampling method and collected the data by using structured questionnaires. The questionnaire was developed using a wide variety of previous research project questionnaires as models and included, to the largest extent possible, standard indicators. Observations were also a feature in the questionnaire design. The questionnaire design is prepared for the water, sanitation and hygiene condition in study area.

The target respondents for the interview are identified as the person who is most responsible for domestic chores in the household such as cooking, fetching water, disposing the refuse, preparing food for the household members, taking care of

the children such as feeding children, cleaning child's bottom and giving care during sick etc. Since the women are the most responsible person for the domestic chores and they are the primary care takers in most of the households in Myanmar, the major respondents are the women. The efforts are made to interview the housewife /mother at home. If they are not available, the person who is available at home and who could provide information is interviewed to obtain the required data. It has four sections in the questionnaire which consists of general information in section A, knowledge on water access and use in section B, knowledge, attitude and practice on sanitation in section C and KAP related to hygiene in section D. There are 39 questions in the questionnaire.

There are 59 village tracts in Thandaungyi township (North), Kayin State. Sample is collected from 9 village tracts from sub-township of Leik Tho, Thandaungyi Township because these village tracts have more population than other village tracts in this township. The total number of sample population is 294 from 9 village tracts of Thandaunggyi township are as followed.

Table 4. 1: Sample Size of the Study from Leik Tho, Thandaunggyi Township

Village Tracts	Number of Sample Households
Ah Doe Thea Pyaw	18
Dar Yoe	17
Hnget Pyaw Taw	33
Ka Lay Kho	53
Ka Lay Ta	36
Kyay Ka Tawt	42
Maung Ba Lauk	32
Taw Pone	39
Ywar Gyi	24
Total	294

Source: Survey Data (2019)

According to the Table (4.1), Sample size is 294 and it was calculated by using sample size calculation for random sampling design. The level of precision, sometimes called sampling error is ± 0.5 percent. The confidence level of this study is 95%, 95 out of 100 samples will have the true population value within the range of precision.

The survey data were collected by the structured questionnaire and most of the respondents are the housewives about 81% and men are only asked when the women are not available at the time of interview are about 19%. Individual one on one interview was held with the respondents. Among the village tracts, Ka Lay Kho has the largest household number than other village tracts. Dar Yoe has the least household number from the sample.

4.3 Survey Results

The analysis of survey is mainly focused on Knowledge, Attitude and Practice of Water, Sanitation and Hygienic behavior among the mother groups of under-5 children. Individual one on one interview was held with mothers. Information was collected at household level by visiting each family. Structured face-to-face interviews with pre-tested questionnaires and observation method were used to elicit information from the respondents.

The enumerators were identified and recruited who already have experiences in similar data collection processes. After hiring the enumerators, the data collection training was conducted with them. Training consisted of 2 days of questionnaire review and practices for the enumerators. The first day of the training was mainly focused on a detailed explanation of the questionnaire, question by question. After that the practical sessions were conducted again the enumerators having clear understanding on the questionnaire.

After the data collection phase was completed, data entries, editing and coding /recording done in SPSS program and MS Excel is used for preparing the graphs and tables. Findings are presented through texts, tables and figures. This data analysis took a total of two weeks and involved disaggregating the data according to various section, namely by knowledge, attitude and practice of accessibility of water, sanitation and hygienic conditions.

4.3.1 Demographic Characteristic of the Respondents

In this section, demographic characteristic of the respondents from the sample survey included gender size, age, education and household member status and it was shown in table 4.2. A total of 294 households are surveyed.

Table 4. 2: Demographic Characteristics of the Respondents

Characteristics	No. of Respondents	Percentage
Gender		
Male	55	18.7
Female	239	81.3
Total	294	100.0
Age (years)		
Under 18	5	1.7
18 - 24	41	13.9
25 - 49	216	73.5
50 - 64	29	9.9
65 and above	3	1.0
Total	294	100.0
Education level		
Illiterate	39	13.3
Can read/ write (local language)	1	0.3
Monastery education	76	25.9
Primary school	119	40.5
Middle school	33	11.2
High school	15	5.1
Graduate	1	0.3
Don't know	10	3.4
Total	294	100.0
Household members		
Under 3	143	9.4
3 – 4 years	57	3.8
5 -12 years	392	25.9
Over 12 years	922	60.9
Total	1514	100.0

Source: Survey Data, 2019

Out of all survey respondents, 73.5% are 25 to 49 years old, 13.9% are in 18 to 24 years old. Only 1.0% older than 64 years and only 1.7% younger than 18 years are responding the questions during interviews.

According to the sample survey, respondents are primarily women 239 (81.3%) since the targets respondents are housewives and men 55 (19%) are only asked when the women are not available at the time of interview. Regarding the

ethnicity all 67.3% of the respondents are Karen, 26.5% are Shan and others are 6.1%. Almost all of them (85.7%) are Christians and 14.3% are Buddhist.

Regarding the education level of respondents of the sample households, it is found that 40.5% of the respondent completed the primary education, 0.3% could read or write local language, graduate and 13.3% are illiterate. According to the findings, illiteracy is more common among females of the household interviewed.

4.3.2 Access to Safe Water Supply

Access and use of an adequate quantity and quality of water is an essential primary health care component. Survey respondents are asked about their main source of drinking water. The following table (4.3) shows the different sources of drinking water and the time taken to carry one time for drinking water in the sample survey of the project villages.

Table 4. 3: Access to safe Water Supply

Main source of household drinking water	No. of respondents	Percentage
Piped-in compound	5	1.70
Public tap	0	0.00
Water flowing up from the ground	40	13.60
Public dug well	50	17.00
Cascade spring	32	10.90
Public concrete storage tank	162	55.10
Others	5	1.70
Total	294	100.0
Time taken to fetch drinking water	No. of respondents	Percentage
Pipe in dwelling (0) min	5	1.70
Within 30 mins	289	98.30
Total	294	100.0

Source: Survey Data, 2019

Across the survey area, the vast majority of households rely on public concrete storage tank which collect water flowing up from the ground (55.1%) as there are few public dug wells (17.0%) in these villages. These storage tanks were not properly covered. Nearly two percent of the respondents stated pipe water (pipe-in compound 1.7%) as their main source of drinking water. Pipe water is also connected from water flowing up from the ground and was not properly protected at the source. About

eleven percent of the respondents mentioned cascade spring as their main drinking water source.

When the respondents are asked whether the source provided drinking water year-round, 99.7% of the household in the survey had year-round availability of drinking water. The time required to fetch drinking water for one time (round trip including waiting time) was also obtained in the survey. All of the sources collected for drinking purpose were reached within 30 minutes of working distance. Some of the households had access to water in their dwelling and they did not need to spend time for fetching water. The average time required to fetch drinking water was 11.5 minutes.

Table 4. 4: Knowledge and Practice of Domestic water treatment

Practice of domestic water treatment before drinking	No. of Respondents	Percentage
Done Nothing	210	71.4
Let settle for a period of time	2	0.7
Boil	24	8.2
Filter with cloth sieve	58	19.7
Knowledge of domestic water treatment for drinking safe water		
Don't know	92	31.3
Let settle for a period of time	1	0.3
Boil	140	47.6
Filter with cloth sieve	134	45.6
Use Alum	1	0.3

Source: Survey Data, 2019

In terms of health impact, it is worth mentioning that, access to an adequate quantity of water is just as important, and, more important, than access to quality or “safe” water. The access to improved water should also include the adequate amount of water accessible to the person (e.g. 15 litres of water per day person). The criterion for quantity was dropped from the current survey’s questionnaire, as it was difficult for respondents to estimate the quantity of water consumed according to the experience in other similar surveys.

The respondents were asked about domestic water treatment practices what they usually do with water once it is collected. According to the information obtained in this survey, majority of the respondents (71.4%) reported that they did nothing. Twenty percent (19.7%) of the respondents reported that they filtered usually with a cloth sieve, 8.2% mentioned boiling, 0.7% stated that they keep water for a period of time to settle. The household water treatment practices could be seen in the table (4.4). Practices towards methods of treating water to make it clean was found to be low among the household, approximately three-fourth of the households did nothing.

The levels of knowledge about water treatment methods were attempted to assess in this survey. The two most common domestic water treatment methods known to the respondent were boiling (47.6%) and filtering (45.6%). Allowing water to settle for a period of time was stated by 0.3% of respondents. Use of alum was mentioned by 0.3% of the respondent. About thirty-one percent of the respondents (31.3%) could not identify any method of household water treatment. The knowledge on domestic water treatment was depicted in the table (4.4).

Awareness about methods of treating water to make it clean was found to be quite low among the respondents as more than half of the respondents did not know the method of treating water for safe drinking. This indicate that even though some of the respondents (47.6%) are aware of boiling as a method of making water clean, there is also a misconception that filtering it with cloth sieve alone can also make it clean (22.4%).

The respondents are also assessed on their knowledge of health hazards on drinking unclean water. Since the respondents can give more than one answers, the health hazards mentioned by the respondents can be seen in the following table (4.5). Although 86.4% of the respondents mentioned that unclean water could lead to illness or disease, only 8.8% of the respondents stated that drinking unclean water could cause diarrhea. Some respondents could mention Dysentery (0.7%). The other health problems mentioned other than diarrhea were categorized as others most of which were not due to the result of drinking unclean water. About six percent of respondents did not know the relationship between drinking unclean water and health and 1.0% said that nothing would happen.

The respondents were also asked how they understand the safe drinking water. The following table (4.5) shows the knowledge of respondents on safe drinking water. Free from micro-organism was mentioned by 2.7%, free from excreta was stated by 4.1% and free from chemical was said by 0.7% of respondents. Colorless water or water without turbidity or transparent water was stated by 16.0% of the respondents. Water without smell was said by 0.7% of the respondent. Free from sediments was mentioned by 12.9% of respondents, free from larvae by 8.8% and free from garbage by 3.4% of respondents. Free from leaves was stated by 2.7% of the respondents. Sixty-three percent of respondents could not express what safe drinking water is. The understanding of safe drinking water is very low. No one could mention safe drinking water is colorless, odorless, tasteless, free of micro-organisms and free of chemicals.

Awareness on contamination of drinking water was also explored in the survey by asking the respondents about the things that can contaminate water at the source, during carrying and during storing water. It is found that about fourteen percent of respondents are not able to mention things that could contaminate water. The things which cause contamination of water mentioned by the respondents are shown in the following table (4.5). Only one percent of the respondents (0.7%) said bacteria/germs, 1.7% of respondents mentioned animal waste and 1.0% states human waste as possible contaminants. No one mentioned dirty hand. The other things mentioned were larvae (32.0%), leaves (18.0%), garbage/trash in water (20.7%), dust (12.2%), chemicals e.g. iron (6.5%), animal or human enter into water source (33.7%) and bathing or washing water enter into water source (5.1%).

Awareness on contamination of water was quite low that none of the respondents could mention dirty hand and approximately ninety eight percent of the respondents did not aware of human waste or animal waste as possible water contamination. The observation was also done whether the water stored were covered or not, whether the pots or containers used for fetching water were clean or not, whether drinking water pot was covered or not and whether the drinking cup was clean or not.

Table 4. 5: Knowledge and Observation about Safe Drinking Water

Knowledge of health hazards of drinking unclean water	No. Of Respondents	Percentage
Don't know	18	6.10
Nothing	3	1.00
Get sick	254	86.40
Diarrhoea	26	8.80
Dysentery	2	0.70
Skin infections/sores	1	0.30
Others	2	0.70
Knowledge of Safe Drinking Water		
Don't know	0	0
Colorless	47	16.00
Odorless	2	0.70
Tasteless	3	1.00
Free from micro-organism	8	2.70
Free from chemicals	2	0.70
Free from excreta	12	4.10
Free from sediments	38	12.90
Free from garbage	10	3.40
Free from larvae	26	8.80
Free from leaves	8	2.70
Others	2	0.70
Knowledge on contamination of water		
Don't know	40	13.60
Human waste	3	1.00
Animal waste	5	1.70
Bacteria/germs	2	0.70
Chemicals e.g. iron	19	6.50
Leaves	53	18.00
Garbage	61	20.70
Dust	36	12.20
Bathing/washing water enter	15	5.10
Larvae	94	32.00
Animal/human enter in water	99	33.70
Others	21	7.10
Observation of water storage and drinking water		
Drinking water covered	71	24.10
Water carriers are clean	54	18.40
Drinking pots/ cups covered	79	26.90
Drinking pots/ cups are clean	45	15.30

Source: Survey Data, 2019

It is found that water storage pots were covered in 24.1% of the households, cleanliness of the water carrier was found in 18.4% of the households, drinking water

pot/cups were covered in 26.9% of the household and cleanliness of drinking cup was found in 15.3% of the households which could be seen in the table (4.5). According to the observation findings, proper storage of drinking water, cleanliness of water carriers and cleanliness of drinking cup are found to be not satisfactory.

4.3.3 Access to Safe Sanitation

The safe disposal of human excreta – including those of children is an essential component of public health. The communities from the rural households should have access to and use of safe, private, comfortable, convenient and sanitary latrines. The survey is attempted to examine household latrine coverage, type of latrine, use and maintenance etc. This is done through interview questions and direct observation.

The table (4.6) shows that household with latrine is 90.8% (including both sanitary and unsanitary) and household without latrine is 9.2%. For those households with no latrine, their defecation practices, reasons for not having a latrine, whether there was a demand, and what benefits they thought they might gain by building a household latrine were explored.

Regarding defecation practice for the households that did not have latrine, use of latrine of neighbours or relatives was stated by 96.3% of the respondents and only 3.7% of the respondents mentioned open defecation. The reasons for not building latrine were asked to respondents of households without the latrine. The reason given by the respondents who had no latrine in their households were shown in the table (4.6).

Type and condition of latrine was examined through direct observation by the interviewer in household with latrine. The table (4.6) shows the different type of latrine observed in the sample households with latrine in the survey villages. Out of the 294 households the most common type of latrine found was pour/flush latrine (51.7%) which was followed by direct pit latrine (38.8%). Less than ten percent of the sample households (9.2%) did not own the latrine.

Table 4. 6: Knowledge and Observation about latrine

Presence of latrine in the household	No. of Respondents	Percentage
Latrine present	267	90.80
No latrine	27	9.20
Total	294	100.00
Type of latrine	No. of Respondents	Percentage
No latrine	27	9.20
pour flush latrine	152	51.70
direct pit latrine	114	38.80
Not recorded	1	0.30
Total	294	100.00
Reason for not building latrines	No. of Respondents	Percentage
Don't know	3	11.1
I did, but it is now unusable/ broke down	19	70.40
busy/no free time	2	7.40
share with relative's lat	1	3.70
lack of space	1	3.70
still building the latrine	1	3.70
Observation findings of pour/flush latrines	No. of Respondents	Percentage
No fly	1	0.70
No smell	9	5.90
Clean latrine pan	33	21.70
Pit covered properly	105	69.10
No leak in pipe connecting pit and latrine pan	112	73.70
presence of vent pipe	2	1.30
Latrine pan covered	12	7.90
Presence of water	138	90.80
Presence of soap	2	1.30

Source: Survey Data, 2019

The table (4.6) showed that the proportion of households with pour/flush latrine (both sanitary and unsanitary) is approximately 56.9 % (152 out of 267). Direct pit latrines were excluded from the sanitary type since the latrine in these areas were

not covered properly. Approximately ninety-one percent of sample households have access to some form of sanitation infrastructure. However, the survey was most interested in the coverage of “sanitary” latrines – fly-proof, pour/flush units. These are considered to be the safer means of excreta disposal, thereby contributing to protecting health.

The interviewer were further explored whether these latrine were fly-proof or not as well as smell-proof or not to decide whether sanitary or not. The following table (4.6) showed the observation findings of 152 pour/flush latrines. Although pit covered properly (69.1%) of pour/flush latrines and no leak in pipe connecting pit and latrine pan (73.7%) of the pour/flush latrines were found, the presence of vent pipe and latrine pan cover were rarely found. The latrine should be both fly-proof and smell-proof to be regarded as sanitary latrine. According to these criteria the sanitary pour/flush latrine in the household which owned the latrine was found to be none. This finding highlights a serious health risk for the communities.

In the present survey, the percentage of households that had any kind of sanitation without taking into account on sanitation was high (90.8%). However, sanitary latrine coverage is none. It is generally estimated that sanitary latrine coverage needs to be at 85% or higher in order to have an impact on public health. With no sanitary latrine coverage in survey areas, indicates the need to promote sanitary latrine and use is a priority concern for healthier environment.

For those who have access to sanitary facilities, the survey tried to assess latrine use patterns and level of care/maintenance. Approximately fifty-nine percent (55.8%) of those that reported having a latrine used them regularly by everybody in the household. Household members most likely not to use the latrine regularly tend to be children under three years of age (43.4%). A few respondents mention children between 3 to 12 years (0.4%) as household members not using the latrine. It could be said that 99.3% of households which owned the latrine (265 out of 267) used the latrine regularly by all family members who were age three and over.

According to the observation, latrine currently being used was found in 95.1% of the households who own the latrine. Evidence of currently being used was judged by one of the following: presence of water in the pot, latrine not locked, lack of webs

over the water pot, lack of webs and debris over pan, lack of dust film over pan, anal cleansing materials (sticks/paper) visible, feces residue visible in pan, path clear in front of latrine, wet floor and verbal confirmation of use.

Observations of household latrines were carried out in order to assess maintenance and sanitary conditions. Superstructure condition, level of disrepair, and general cleanliness were factors used to determine adequate maintenance and sanitary conditions. Approximately seventy-nine percent of the latrines observed were not considered well maintained. This was determined through interviewer observation which examined the sanitary and maintenance condition of the latrine. About four-fifth of the households in the survey had not maintained their latrines. This indicates that the awareness of the importance of hygienic latrines is low in these households.

In this survey anal cleansing practices were examined as well. The anal cleaning material in the latrine, availability of water, availability of soap and water in the latrine was also observed. The following table (4.7) shows the observation of anal cleansing material. Based on observations, stick is the most common (41.6%) for anal cleaning followed by the combination of sticks and water (27.3%) and followed by water (27.0%).

Table 4. 7 : Observation Findings of anal cleansing material

Anal cleaning material	No. of Respondents	Percentage
Stick	111	41.60
Water	72	27.00
Paper and water	1	0.40
Stick and water	73	27.30
Cannot determine	9	3.40
Not recorded	1	0.40
Total	267	100.0

Source: Survey Data, 2019

Inadequate disposal of human waste can have dramatic health consequences. The need to promote sanitary latrine construction and use is a priority concern for healthier environment. Adequate disposal of children's feces is also an important hygiene behavior. The excreta of children under three years of age are considered more virulent than that of older children and adults. We asked those households with

children under-three how they normally dispose of children's waste and the findings were presented in the following table (4.8).

Table 4. 8: Defecation Practice

Practice of mother on disposal of under 3 children's feces	No. of Respondents	Percentage
Children always use latrine	1	0.70
Throw into latrine	37	26.80
Bury in yard	6	4.30
wash with water	94	68.10
Total	138	100.0
Defecation practice of three to twelve children		
Latrine	237	98.30
In the yard	2	0.80
Not recorded	2	0.80
Total	241	100.0

Source: Survey Data, 2019

This table shows that out of 294 households visited only 138 households had children under - three years of age. Nearly twenty-seven percent of mothers (26.8%) reported that they throw into latrine and 0.7% of mother reported that their children used the latrine. About four percent (4.3%) of respondents said that they covered with sand in yard. Sixty-eight percent of the respondents (68.1%) said that under-three's feces were washed with water. Only 31% of the mother had practiced the proper disposal of children's feces and the behavior change of mothers on proper disposal of under-three children's feces needed to be promoted.

Respondents were also asked about the defecation practices of 3-12 year-olds and the responses were displayed in the table (4.8). Out of the 294 households visited, 241 households had three to twelve year-olds children. It is reported that 98.3% used a latrine while the rest of 3-12 year-olds practice open defecation usually around the house in the yard or outside the yard.

Although the defecation habit of 3-12 years children was correct in 98.3%, the remaining 2% also needed behaviour change from open defecation to the use of latrine.

4.3.4 Access to Safe Hygiene

Whether the respondents have knowledge of four cleans was also asked. The respondents who could not state what four cleans were 55.1% in the survey. Only one respondent could mention all four cleans. About 33.7% of survey respondents could mention water clean, 26.9% could express food clean, 1.4% could mention hand clean and 13.3% could say latrine clean which could be seen in the following table (4.9).

The survey respondents are also inquired what the personal hygiene practices are. Majority of respondents (60.5%) said that taking bath daily, 42.9% mentioned wearing washed clothes, 11.2% said shampooing hair, 7.1% stated that hand washing, 5.8% mentioned that washing face and 8.5% expressed that brushing teeth as personal hygiene practices. Cutting nail (3.7%), combing hair (5.1%) and changing clothes every day (9.5%) are also mentioned by the respondents as personal hygiene practices.

Table 4. 9: Knowledge on Four Cleans and Personal Hygiene

Description	No. of Respondents	Percentage
Knowledge on Four cleans		
Clean food	79	26.9
Clean latrine	39	13.3
Clean water	99	33.7
Clean Hand	4	1.4
Don't know	162	55.1
Knowledge on Personal hygiene		
Comb hair	15	5.1
Wash Face	17	5.8
Brush teeth	25	8.5
Take bath daily	178	60.5
Shampoo hair	33	11.2
Hand washing	21	7.1
Cutting nail	11	3.7
Wear washed clothes	126	42.9
Change clothes	28	9.5

Source: Survey Data, 2019

4.3.4.1 Hand-Washing Practice

Hand-washing practice is chosen as a focus of hygiene behavior for this survey because it is one of the most important health behaviors in terms of disease

prevention and control. The oral-fecal cycle must be broken in order to prevent transmission of common diarrheal disease. The promotion of hand-washing at critical times (before eating, before feeding child, after defecation, and after cleaning a child's bottom) is a fundamental component of any hygiene promotion component.

Hand-washing behaviors were assessed by self-report and through household observation. Respondents are asked about their hand-washing practices. Then through interviewer observation, it is determined whether or not there was soap and water for hand-washing present in the compound or household surrounding.

The respondents are asked when they usually wash their hands during the whole day without prompting so that the answer given by the respondents could be hand-washing done regularly. They might be forgotten to express the hand-washing practice which is not done regularly. Hand-washing practice of the respondents is presented in the table (4.10).

Table 4. 10: Daily Hand Washing Practice of mother

Daily Hand Washing Practice of mother	No. of Respondents	Percentage
After defecation	87	29.6
Before eating	261	88.8
After eating	172	58.5
After cleaning child's bottom	2	0.7
Before feeding children	0	0.0
After work	12	4.1
After touching waste	2	0.7
When they are dirty	28	9.5
After handling animals	0	0.0
Others	15	5.1

Source: Survey Data, 2019

Eighty-nine percent of respondents stated that they usually wash their hand before eating, 58.5% of respondents said that they usually wash their hand after eating. Hand-washing after defecation is stated by 29.6% of respondents and hand-washing after cleaning child's bottom is mentioned by only 0.7% of the respondents.

The questions are then asked regarding the critical hand-washing times – before taking food, before feeding child, after defecation and after cleaning child's bottom. In these critical hand-washing times, regularity of hand washing (always or sometimes or rarely or never), hand-washing with what (water only or soap and water or ash and water or rag or others) and how hand washing is done (thoroughly or superficially or just dip in water) are questioned in detail. Thoroughly means washing by pouring water on both hands scrubbing thoroughly each other. Superficially means they wash by pouring water on only one hand and not scrubbing enough. Just dip in water means to wet their hands with water only in a bowl.

4.3.4.2 Hand-washing practice before taking food

The questions are asked whether they wash their hands regularly and 99.6% of respondents said that they always wash their hands before taking food which could be seen in the following table (4.11).

Table 4. 11: Hand Washing Practice before taking food

Hand washing practice before taking food	No. of Respondents	Percentage
Regularity		
Rarely	3	1.0
Sometimes	4	1.4
Always	287	97.6
Total	294	100.0
Hand washing with what		
Water only	247	84.0
Soap and water	47	16.0
Total	294	100.0
How hand washing was done		
Just dip in water	182	61.9
Superficially	62	21.1
Thoroughly	49	16.7
Not recorded	1	0.3
Total	294	100.0

Source: Survey Data, 2019

The questions are asked with what they wash their hands before taking food. Low proportion of respondents (16.0%) reported using soap and water to wash their hands before taking food. The majority (84.0%) responded that they use water only to wash hands before taking food. (See the table 4.11).

The question was then asked how they wash their hands before taking food – thoroughly with both hands or superficially or just dip in water etc. Nearly seventeen percent (16.7%) reported that they washed their hands thoroughly, 21.1% reported superficially and 61.9% reported that they just dip in water to wet their hand and this water is used by all family members where possible contamination can be spread by practicing this method.

According to survey, it shows that out of the 294 respondents interviewed, 287 had said that they always wash their hands before taking food (97.6%). Out of that, 47 respondents reported they use soap and water (16.0%) and only 46 respondents reported that they used soap and water and washed their hands thoroughly by rubbing both hands (15.6%).

4.3.4.3 Hand-washing before feeding child

Hand-washing practice before feeding child is compiled only for those respondents who currently have young children to feed the children. There are 69 respondents in who have young children to feed and the rest do not need to feed the children or supplementary feeding not started yet.

Nearly ninety-six percent of the respondents (95.7%) said that they always wash their hands before feeding child, 1.4% washed their hand sometimes whereas 2.9% of respondents rarely their hands before feeding child which could be seen in the table (4.12).

The questions are asked with what they wash their hands before feeding child. Hand-washing with soap and water before feeding child is reported by 7.2% of respondents and with water only for hand-washing before feeding child is stated by 92.8% of respondents. Then how they wash their hands before feeding child is asked, only 7.2% of respondents reported thoroughly, 34.8% mentioned superficially and 58.0% stated just dip in water which is shown in the following table (4.12).

Table 4. 12: Hand Washing Practice before feeding child

Hand washing practice before feeding child	No. of Respondents	Percentage
Regularity		
Rarely	2	0.7
Sometimes	1	0.3
Always	66	22.4
No under-3 yr children or no need to feed	225	76.5
Total	294	100.0
Hand washing with what		
Water only	64	21.8
Soap and water	5	1.7
No under-3 yr children or no need to feed	225	76.5
Total	294	100.0
How hand washing was done		
Just dip in water	40	13.6
Superficially	24	8.2
Thoroughly	5	1.7
No under-3 yr children or no need to feed	225	76.5
Total	294	100.0

Source: Survey Data, 2019

The table (4.12) shows that out of the 294 respondents interviewed, 69 respondents have young children to feed and the rest do not need to feed the children or supplementary feeding not started yet. 66 respondents said always wash their hands before feeding child (95.7%). Out of that only 5 respondents reported use soap and water (7.2%) and 5 respondents had reported that they used soap and water and washed their hands thoroughly by rubbing both hands (7.2%).

4.3.4.4 Hand-washing after defecation

Thirty-two percent of respondents reported that they always wash their hands after defecation and only 3.1% of the survey respondents reported that they had never washed their hands after defecation which could be seen in the table (4.13).

Table 4. 13: Hand Washing Practice after defecation

Hand washing practice after defecation	No. of Respondents	Percentage
Regularity		
Never	9	3.1
Rarely	35	11.9
Sometimes	156	53.1
Always	94	32.0
Not recorded	0	0.0
Total	294	100.0
Hand washing with what		
Nothing	9	3.1
Water only	237	80.6
Soap and water	46	15.6
Not recorded	2	0.7
Total	294	100.0
How hand washing was done		
No hand washing	9	3.1
Just dip in water	55	18.7
Superficially	179	60.9
Thoroughly	44	15.0
Not recorded	7	2.4
Total	294	100.0

Source: Survey Data, 2019

The questions are asked with what they wash their hands after defecation. More respondents wash their hands using only water (80.6%) than using soap and water (15.6%) after defecation. Then how they wash their hands after defecation is asked, only 15.0% of respondents reported thoroughly, 60.9% of the respondents stated superficially, 18.7% of respondents reported just dip in water and 1.7% reported no hand washing.

It shows that out of the 294 respondents interviewed, 94 had said that they always wash their hands after defecation (32.0%). Out of that 44 respondents reported they use soap and water (15.0%) and only 42 respondents reported that they use soap and water and wash their hands thoroughly by rubbing both hands (14.3%).

4.3.4.5 Hand-washing practice after cleaning a child's bottom

Hand-washing practice after cleaning child's bottom is compiled only for those respondents who currently have young children to clean the child's bottom. There are

146 respondents who have young children to clean the child's bottom and the rest do not need to clean the child's bottom.

Nearly thirty-five percent of the respondents (34.9%) reported that they always washed their hand after cleaning the child's bottom, 43.2% washed their hand sometimes and 14.4% washed their hand rarely whereas 6.8% of respondents never wash their hands after cleaning the child's bottom. The questions are asked with what they wash their hands after cleaning child's bottom. Nearly nineteen percent of the respondents (18.5%) reported using soap and water to wash their hands after cleaning child's bottom and 72.6% of the respondents responded that they use water only to wash hands after cleaning child's bottom which could be seen in the table (4.14).

Table 4. 14: Hand Washing Practice after cleaning child bottom

Hand-washing practice after cleaning child bottom	No. of Respondents	Percentage
Regularity		
Never	10	3.4
Rarely	21	7.1
Sometimes	63	21.4
Always	51	17.3
No young children	148	50.3
Not recorded	1	0.3
Total	294	100.0
Hand washing with what		
Nothing	10	3.4
Water only	106	36.1
Soap and water	27	9.2
No young children	148	50.3
Not recorded	3	1.0
Total	294	100.0
How hand washing was done		
No hand washing	10	6.8
Just dip in water	33	22.6
Superficially	73	50.3
Thoroughly	27	18.5
No young children	148	50.3
Not recorded	3	2.1
Total	294	100.0

Source: Survey Data, 2019

Then how they wash their hands after cleaning the child's bottom is asked, only 18.5% of respondents reported thoroughly, 50.0% mentioned superficially,

22.6% stated just dip in water and 6.8% stated no hand washing which is shown in the table (4.14).

The table (4.14) shows the hand washing practices after cleaning child's bottom, hand washing always, hand washing with soap and water and hand washing thoroughly. Out of the 294 respondents interviewed, 146 respondents have young children and the rest do not have young children to clean the child's bottom. Among them, 51 said that they always wash their hands after cleaning child's bottom (17.3%). Out of that 27 respondents reported they use soap and water and (18.5%) washed their hands thoroughly by rubbing both hands.

4.3.4.6 Knowledge regarding hand-washing

Knowledge regarding hand-washing are also assessed in the survey. Respondents are asked about the advantages of hand-washing. Respondents could associate hand-washing with good health and disease prevention in 49.3% of the households. Cleanliness is an advantage mentioned by 32.0% in this survey. The respondents who did not know the advantage of hand-washing are 13.6%.

Although nearly half of the respondents understood the association between hand-washing and health, their practice was not commensurate with this knowledge. Scarcity of water is one of the problems. Due to the extreme poverty in many parts of rural Myanmar, cost may be an important barrier to the use of soap. Many poor families simply do not have the income to purchase soap.

Household observations are also made to assess the level of hand-washing behavior. Observation is done on the availability of soap and water not only inside the latrine but also near or on the way to latrine. Availability of soap/ ash and water near vicinity of latrine is 0.4% of the households with latrines, 99.3% of the households with latrines have no availability of soap and water and 0.4% of the households were not recorded.

Observation of hand washing facilities (soap and water) in/surrounding the house is also done. Seventy-six percent of the households do not have the facilities. In 23.5% of households there is evidence that soap and water container in/surrounding the house and that it appears to be used for hand-washing.

4.3.5 General Household Environment

Hygiene conditions in the household environment make an important contribution to the public health; this was another focus of the survey. Other environmental health observations are made at the survey households including food conservation practice and cleanliness of household surroundings. The degree to which the household surroundings are free from visible excreta is also observed. The observation finding is presented in the following table.

Table 4. 15: Observation on cleanliness of the household surrounding/compound

Observation on cleanliness of the household surrounding/ compound	No. of Respondents	Percentage
Surrounding appears free of contaminants or garbage	32	10.9
Surrounding appears free of contaminants but garbage present	112	38.1
Presence of animal excreta & garbage in surrounding	139	47.3
Presence of animal excreta only in surrounding	10	3.4
Not recorded	1	0.3
Total	294	100.0

Source: Survey Data, 2019

All of the households surveyed appeared to be free of human excreta. Animal excreta were found in 50.7% of household surroundings. Although the household surrounding/compound was free from excreta, garbage was observed in 38.1% of the households. Free of excreta or garbage was observed in 10.9% of the households. Due to the fact that animal excreta's are exposed in the area of the villages, it is important to have food covered in order to keep the flies away. Whether the prepared food was covered or not is needed to be observed, it is found that covered in 12.2% of the households and uncovered in 8.5% of the households. In 78.9% of the households, food conservation practices could not be determined since there is no prepared food and it was not recorded in 0.3% of the households.

On observation of the cooking environment, it was dirty in 74.5% and very dirty in 17.0% of the households. Cleanliness of the cooking place was found only in 8.2% of households.

Regarding the cleanliness of cooking utensils and dishes for eating, it was found to be dirty in 73.8% and very dirty in 17.3% of the households and cleanliness of cooking utensils and dishes for eating was found only in 8.5% of households. Whether the left-over food and garbage from the kitchen are properly disposed or not is also observed in the survey. Sixty-eight percent (67.8%) of the households properly disposed the kitchen garbage and left-over food and 31.9% disposed improperly. Whether the water spilled over from the kitchen was stagnant around the surrounding of house is also observed. Majority of the household surroundings (86.8% of household) are dried and no evidence of water. Whether there is drain for outlet of used water and if there is drain, whether functioning or not is also observed. Ninety-five percent of household (94.6%) do not have drain and observation was not recorded in 0.3% of the household. The drain was only present in 5.1% of households and 53.3% of drain is functioning.

4.3.6 Health Problems in the community

The respondents are asked that whether they had experienced health problems or occurrence of diseases in their households. About fifty-two percent of the households had experience of health problem. The respondents are also enquired the common health problems occurring in the village. The respondents could report more than one health problems which were occurring commonly in their villages and the reported health problems could be seen in the following table (4.16).

It is found that common cold/fever and cough were the commonest health problems in these communities during past one year. It is also found that the malaria problem was mentioned by 17.0% of the respondents and diarrhea/dysentery problem was reported by the 51.4% of the respondents.

The respondents are also inquired where the community went for these health problems to explore the treatment seeking behavior of the respondents. Sixty-nine (69%) percent of the respondents mentioned Midwives and 30.3% of the respondents said Illegal practitioners. Drug shop is mentioned by 20.1% and Traditional medicine Practitioner (TMP) is stated by 8.2% for seeking treatment.

Table 4. 16: Health problems and Treatment seeking behavior

Health problems	No. of Respondents	Percentage
Common cold/fever	164	55.8
Cough	78	26.5
Flu	47	16.0
Hypertension	4	1.4
Diarrhoea/ dysentery	151	51.4
Malaria	50	17.0
DHF	1	0.3
Respiratory tract infection	2	0.7
Skin diseases	3	1.0
Abdominal pain	5	1.7
Others	5	1.7
Places/personnels for seeking treatment for the common health problems	No. of Respondents	Percentage
Hospital	5	1.7
Private clinic	5	1.7
Mid-wife	203	69.0
CHW	3	1.0
Traditional medicine Practitioner	24	8.2
Illegal practitioner	89	30.3
Drug shop	59	20.1

Source: Survey Data, 2019

4.3.6.1 Knowledge on causes and prevention of Diarrhoea

The respondents were asked to state the causes of diarrhea and were again enquired how they can prevent diarrhoea to assess their knowledge on diarrhoea prevention.

The table (4.17) shows that about half of the respondents (55.4%) believed that eating the wrong foods result in diarrhea. About twenty percent of the respondents believed that contaminated food causes diarrhea, while 10.9% mentioned drinking unclean water as a cause. Flies and other insects were thought to cause diarrhea by 0.7% of respondents. Only 5.1% of the respondents mentioned poor hygiene and no hand washing (1.7%) causes diarrhea.

Table 4. 17: Knowledge on causes and prevention of Diarrhoea

Knowledge on causes of Diarrhoea	No. of Respondents	Percentage
Don't know	36	12.2
Drinking unclean water	32	10.9
Eating contaminated foods	60	20.4
Flies and other insects	2	0.7
Poor hygiene	15	5.1
No hand washing	5	1.7
Eating vegetables and fruits	13	4.4
Eating over-ripened fruit	2	0.7
Eating wrong food	163	55.4
Weather	36	12.2
Knowledge on Prevention of Diarrhoea		
Don't know	123	41.8
Drinking safe water	47	16.0
Protect food from flies	83	28.2
Handwashing	11	3.7
Use proper sanitary latrine	3	1.0
Eating well cooked food	10	3.4
Clean household surrounding	4	1.4
Proper disposal of children's excreta	1	0.3
Others	58	19.7

Source: Survey Data, 2019

It is found that some respondents said diarrhea was due to weather change (12.2%). Some of the few responses were categorized as others which are not the causes of diarrhea. Some respondents could not express the cause of diarrhea (12.2%). No one mentioned that diarrhea was due to bacteria/virus/pathogen or diarrhea was due to ingesting human or animal waste.

Some of the respondents are able to make few associations between dirty/unclean water and diarrhea (10.9%) and some of the respondents are able to make few associations between contaminated food and diarrhea (20.4%), although majority could not able to express association between poor hygiene including personal hygiene (hand washing) and diarrhoea, and no one able to make association between poor environmental hygiene and diarrhea or between pathogen/germs and diarrhea.

The table (4.17) shows that protecting food from flies could prevent diarrhea was stated by 28.2% of the respondents. Sixteen percent of respondents stated that

diarrhea could be prevented by drinking clean water. Hand washing was mentioned by 3.7% of the respondents. Using proper sanitary latrine could prevent diarrhea was told by 1.0% of respondents. Only 0.3% of the respondents' stated proper disposal of children's excreta could prevent diarrhea. Some responses were categorized as others (19.7%) which were not the way for diarrhea prevention.

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 although food clean and some extent to water clean were known to them.

4.3.6.2 Diarrhea Prevalence

In this survey, seventy-six households (25.9%) had diarrhea occurrence in at least one of the household members out of sample households (294). Total household members are 1514 in the sample households in this survey. Total numbers of household members who had diarrhea in previous one month is 81. Diarrhea prevalence of previous one month is 5.4% in this survey.

About thirty-nine percent of respondents from the households with diarrhea occurrence said that they treated diarrhea with western medicines and with traditional medicine by 33%. Seeking treatment at health center or with CHW is not stated by any one and also treated with illegal practitioners was not also mentioned. Fifteen percent of the respondents from the households with diarrhea occurrence mentioned ORS. About ten percent of the households with diarrhea occurrence said that they did nothing for diarrhea which could be seen in the table (4.18).

Childhood diarrhea disease remains one of the most significant child health problems as a leading cause of morbidity and mortality among children under five. Reducing diarrhea prevalence is the anticipated long-term outcome and overall goal of the environmental health. This table (4.18) shows that out of the 294 households, 177 households (60.2%) had children below five years of age. Diarrhea prevalence was estimated with the self-reported question: "Did any member from your household have diarrhea in the last one month period" – where diarrhea was defined as three or more loose or watery stools/day or blood in stool or as determined by the mother. If there was occurrence of diarrhea in the household, number of household members

who had diarrhea, is further questioned by total number of household members who had diarrhea in that period and out of that how many in that diarrhoea occurrence include children under-five years of age. Out of 200 children under-five represent in the survey, 36 are reported to have had diarrhea during the previous one month. The overall under-five diarrhea prevalence in the study area is estimated to be 180 cases per thousand children. The percentage of children under five with diarrhea in previous one month is 18.0% in this KAP survey.

Table 4. 18 : Management During Diarrhoea

Management during diarrhoea	No. of Respondents	Percentage
Nothing done	9	11.84
Local remedies	3	3.95
Traditional medicine	30	39.47
Western medicine	35	46.05
ORS	13	17.11
Management of under-5 children during diarrhoea		
Nothing given	7	20.0
Water alone	2	5.7
Water with feeding	6	17.1
Breast milk	21	60.0
Other milk/ milk powder	1	2.9
Oral rehydration solution	11	31.4

Source: Survey Data, 2019

It is found that out of the 76 household with diarrhea occurrence, 35 households had occurrence of diarrhea in under-five years of age. The respondents from households with children under five diarrhea occurrence, what type of liquid are given during diarrhea is asked. About thirty-one percent gave ORS, 60.0% gave breast milk and 17.1% gave water with feedings. Twenty percent said nothing was given during diarrhea of their children which could be seen in the table (4.18).

Whether mothers or care givers have correct knowledge of making oral rehydration solution (ORS) and duration of use of ORS after making it are also enquired to all households. The knowledge of making ORS properly and knowledge about when to discard the already made ORS are important in providing ORS to the children with diarrhea. Only 34.7% of respondents answer correctly how to make ORS and 19% of respondents know when to discard ORS after making it.

CHAPTER 5

CONCLUSION

5.1 Findings

Based on the survey of this study, it was found that majority of the people finished their education only at primary level. It was clearly seen that people who have lower level of education have little awareness of personal hygiene and cleanliness.

Across the survey area, the vast majority of households rely on public concrete storage tank which collect water flowing up from the ground (55.1%) as there are few public dug wells (17.0%) in these villages. These storage tanks were not properly covered. Nearly two percent of the respondents stated pipe water (pipe-in compound 1.7%) as their main source of drinking water. Pipe water is also connected from water flowing up from the ground and was not properly protected at the source. About eleven percent of the respondents mentioned cascade spring as their main drinking water source.

All of the sources collected for drinking purpose were reached within 30 minutes of working distance and 99.7% of the household in the survey had year-round availability of drinking water. The average time required to fetch drinking water was 11.5 minutes. The safe drinking water sources which provide year-round within 30 minutes of walking distance are found to be 0% as all the water sources are not properly protected.

Domestic water treatment practice include: boiling (8.2%), filtering – usually with a piece of cloth (19.7%) and letting the water settle for a period of time (0.7%). About seventy percent of respondents report no domestic water treatment done. However, knowledge of treatment methods was limited to primarily filtering (22.4%)

and boiling (47.6%). About thirty-one percent of the respondents could not identify any method of household water treatment.

Although 86.4% of the respondents mentioned that unclean water could lead to illness or disease, only 8.8% of the respondents stated that drinking unclean water could cause diarrhea. About six percent of respondents did not know the relationship between drinking unclean water and health and 1.0% said that nothing would happen. Knowledge on safe drinking water was so low that that free from micro-organism was mentioned by 2.7%, free from excreta was stated by 4.1% and free from chemical was said by 0.7% of respondents. Colorless water or water without turbidity or transparent water was stated by 16.0% of the respondents. Water without smell was said by 0.7% of the respondent. Sixty-three percent of respondents could not express what safe drinking water is. No one could mention safe drinking water is colorless, odorless, tasteless, free of micro-organisms and free of chemicals.

Awareness on contamination of water was quite low that none of the respondents could mention dirty hand and approximately ninety eight percent of the respondents did not aware of human waste or animal waste as possible water contamination although only 0.7% of the respondents said bacteria/germs. It is found that water storage pots were covered in 24.1% of the households, cleanliness of the water carrier was found in 18.4% of the households, drinking water pot/cups were covered in 26.9% of the household and cleanliness of drinking cup was found in 15.3% of the households.

In general, sanitation coverage and access to latrines is high in the surveyed communities. The residents in slum area have latrine at home though, most of the latrines are poorly maintained and covered with torn out tarpaulin and bamboo. It is observed that some of the latrines are partially functional and latrine cannot be covered from smell and flies. The majority of the latrines were not sanitary and fly proof and the use of these latrines are mostly for the sake of privacy and convenience rather than for health and hygiene. According to the observation result, a toilet is shared by two or three households in some villages. In terms of quantity and quality of toilet, it is not acceptable according to the findings from interview because the practice of sharing a toilet among many people is not hygienic. To be concluded that

all the families have latrine some are own and some are shared, hence, at least they do not defecate in the open.

Out of 294 households visited only 138 households had children under - three years of age. Nearly twenty-seven percent of mothers (26.8%) reported that they throw into latrine and 0.7% of mother reported that their children used the latrine. Only 27% of the mother had practiced the proper disposal of children's feces and the behavior change of mothers on proper disposal of under-three children's feces needed to be promoted. Out of the 294 households visited, 241 households had three to twelve year-olds children. Although the defecation habit of 3-12 years children was correct in 98.3%, the remaining 2% also needed behaviour change from open defecation to the use of latrine.

Hand-washing practice is chosen as a focus of hygiene behavior for this survey because it is one of the most important health behaviors in terms of disease prevention and control. The questions are asked regarding the critical hand-washing times – before taking food, before feeding child, after defecation and after cleaning child's bottom. In these critical hand-washing times, regularity of hand washing (always or sometimes or rarely or never), hand-washing with what (water only or soap and water or ash and water or rag or others) and how hand washing is done (thoroughly or superficially or just dip in water) are questioned in detail. Thoroughly means washing by pouring water on both hands scrubbing thoroughly each other. Superficially means they wash by pouring water on only one hand and not scrubbing enough. Just dip in water means to wet their hands with water only in a bowl.

Hand washing is relatively common. Most of the respondents are aware of hand washing with soap is good for health but it is difficult to say whether they follow its practice or not. It is realized that they are accustomed to wash their hands with soap and water at the time of before eating and feeding the child, however, apparently, and washing with soap and water at the time of after defecation and after cleaning the child's bottom was quite low.

Household observations are also made to assess the level of hand-washing behavior. Observation is done on the availability of soap and water not only inside the latrine but also near or on the way to latrine. Availability of soap/ ash and water near

vicinity of latrine is 0.4% of the households with latrines, 99.3% of the households with latrines have no availability of soap and water and 0.4% of the households were not recorded. Observation of hand washing facilities (soap and water) in/surrounding the house is also done. Seventy-six percent of the households do not have the facilities. In 23.5% of households there is evidence that soap and water container in/surrounding the house and that it appears to be used for hand-washing. According to the observation findings, the self-reported responses on hand-washing with soap and water may be over-reporting.

People could associate hand-washing with good health and disease prevention in 49.3% of the households. Cleanliness is an advantage mentioned by 32.0% in this survey. The respondents who did not know the advantage of hand-washing are 13.6%.

The degree to which the household surroundings are free from visible excreta is also observed. Although the household surrounding/compound was free from excreta, garbage was observed in 38.1% of the households. Free of excreta or garbage was observed in 10.9% of the households.

Adequate food hygiene by covering food is observed in 12.2% of the households and uncovered in 8.5% of the households. In 78.9% of the households, food conservation practices could not be determined since there is no prepared food and it was not recorded in 0.3% of the households.

On observation of the cooking environment, it was dirty in 74.5% and very dirty in 17.0% of the households. Cleanliness of the cooking place was found only in 8.2% of households. Regarding the cleanliness of cooking utensils and dishes for eating, it was found to be dirty in 73.8% and very dirty in 17.3% of the households and cleanliness of cooking utensils and dishes for eating was found only in 8.5% of households. Whether the left-over food and garbage from the kitchen are properly disposed or not is also observed in the survey. Twenty-nine percent (28.9%) of the households properly disposed the kitchen garbage and left-over food and 70.7% disposed improperly.

Diarrhea prevalence was also studied. The percentage of children under five with diarrhea in previous one month is 18.0% in the survey of KAP on hygiene. Since

the diarrhoea is one of the top killer diseases the best way to protect a child from diarrhoea disease is to keep the child's living space free of the microbes that causes the diarrhoea. That means adopting a number of safe hygiene practices in or around the home. Apart from improvements in water supply and sanitation, practicing safer hygiene behavior is also needed.

Regarding the knowledge of diarrhea causes, 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 (hand washing) and diarrhoea, and no one able to make association between poor environmental hygiene and diarrhea or between pathogen/germs and diarrhea.

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 although food clean and some extent to water clean were known to them. Moreover, the majority of 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.

5.2 Recommendations

This study is able to identify the knowledge, attitude, and practice (KAP) of hygienic behaviour among mothers group of under-5 children and caregivers. The survey finding suggests to respondents that 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 get the progress to fight against

poverty so supply of water at household level can play a vital role to reducing water-borne 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 on the mother or primary caretaker's role in 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 hand-washing. The emphasis should be on children's hygiene behaviour related to hand-washing at critical times and use of latrines for defecation. Childhood is the perfect time for children to receive hygiene behaviors and practices. If children 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, primary caretakers to increase knowledge on better household hygiene practices and children focus hygiene education promotion program in child friendly way 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 maternal mortality and to end preventable deaths of newborns and children.

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APPENDICES

Annex 1: Township and District Map of Kayin State



Source: The MIMU, 23rd October 2017

Annex 2: Knowledge, Attitude and Practice of WASH Survey Questions

Village Name	
Village Tract Name	
Enumerator Name	
Date of Data Collection	

Demographic Characteristic

1. Age of respondent

2. Gender
Male = (1) Female = (2)

3. Ethnicity

1.Kachin	5. Burma	9. Pa Oh
2.Kayah	6. Mon	10. Danu
3. Kayin	7.Rakhine	11.Others
4. Chin	8.Shan	

4. Household level of Household Head

Education level of husband
1. Illiterate
2. Can read/ write (local language)
3. Can read/ write (Myanmar)
4. Monastery education
5. Primary school
6. Middle school
7. High school
8. College / University
9. Diploma
10. Graduate
11. Don't know

5. Household level of Housewives

Education level of housewives
1. Illiterate 2. Can read/ write (local language) 3. Can read/ write (Myanmar) 4. Monastery education 5. Primary school 6. Middle school 7. High school 8. College / University 9. Diploma 10. Graduate 11. Don't know

Access to Safe Water Supply Questions

6. What is the main source of drinking-water for your household? Give the main source only.

Main source of household drinking water	
1. Piped water into dwelling 2. Piped water to yard/plot 3. Public tap/ standpipe 4. Cart with small tank/drum 5. Tanker/truck 6. Tube well/borehole 7. Protected dug well (Brick-lined well) 8. Unprotected dug well 9. Protected spring 10. Unprotected spring 11. Rainwater collection 12. Bottled purified water (Purchased) 13. Surface water (river, dam, lake, pond, stream, canal, irrigation channels) 14. Others (Mention)_____	

(a) How long does it take to fetch water round-trip?

Don't Know	(1)	31 – 60 mins	(4)
Pipe in dwelling (0) min	(2)	61 – 120 mins	(5)
Within 30 mins	(3)	Over 120 mins	(6)

7. Do you purify drinking water before use?

Yes (1) No (2)

If “Yes”, what do you usually do to the water to make it safer to drink? Anything else? Record all responses by ticking √ in the box mentioned.

1. Done Nothing	
2. Let settle for a period of time	
3. Boil	
4. Filter with cloth sieve	
5. Use chlorine	
6. Use Alum	
7. Others -----	

8. How could we treat water to make it clean/safe to drink?(can be answered more than one). Record all responses by ticking √ in the box mentioned.

1. Done Nothing	
2. Let settle for a period of time	
3. Boil	
4. Filter with cloth sieve	
5. Use chlorine	
6. Use Alum	
7. Others -----	

9. What can happen if someone drinks unclean/ unsafe water? What else? Any others?

Don't Know	(1)	Diarrhea	(4)
Nothing	(2)	Dysentery	(5)
Get Sick	(3)	Skin Infections/Sores	(6)
Others	(7)		

10. What are your norms for clean/safe water? (can be answered more than one). Record all responses by ticking √ in the box mentioned.

Don't Know	(1)	Free from micro-organism	(7)
Colorless	(2)	Free from chemicals	(8)
Odorless	(3)	Free from excreta	(9)
Tasteless	(4)	Free from sediments	(10)
Free from garbage	(5)	Free from larvae	(11)
Free from leaves	(6)	Others	(12)

11. Can you tell me, as far as you know, what can contaminate the water when it is stored? What else? Any others? (can be answered more than one). Record all responses by ticking ✓ in the box mentioned.

1.Don't know	
2.Human waste	
3.Animal waste	
4.Bacteria/germs	
5.Dirty hands	
6.Chemicals e.g. iron	
7.Leaves	
8.Garbage	
9.Dust	
10.Bathing/washing water enter	
11.Larvae	
12.Animal/human enter in water	

Access to Safe Sanitation Questions

12. Do your household has latrine? If yes, please go to question (17).

☐

Yes (1) No (2)

13. If the answer is “No”, where did you and your house members usually go to defecate?

☐

Open Defecation (1)

Relatives/Neighbors/public latrine (2)

Don't Know (3)

Others (4)

14. What is the reason for not building latrine(can be answered more than one). Record all responses by ticking ✓ in the box mentioned.

1.Too expensive	
2.Don't know how to built	
3.Don't like latrine/prefer using field	
4.I did, but it is now unusable/ broke down	
5.Others -----	
6.Don't know	

15. Do you have any plan to build the latrine for your household in the future?

Yes (1)

No (2)

Don't Know (3)

☐

16. How do you think what advantage do you get out of building and using latrine? Record all responses by ticking ✓ in the box mentioned.

1. Smells better	
2. Less flies	
3. Convenience	
4. Better for health/prevents disease	
5. Feel better about having guests	
6. Others-----	
7. Don't know	

Ask those who say they have latrine.

17. Is there any household member who does not regularly use? Who are they? Give ✓ in the respective box.

Everyone uses the latrine	
Children under 3 years	
Children of 3 - 12 year	
Boys	
Girls	
Old people	
Disabled people	
Others -----	

18. What is the reason for building latrine? (can be answered more than one). Record all responses by ticking ✓ in the box mentioned.

1. Smells better	
2. Less flies	
3. Convenience	
4. Better for health/prevents disease	
5. Feel better about having guests	
6. Others-----	
7. Don't know	

Access to Hygiene Questions

Do you have children at the age of under 5 years old? -----

19. In any day of the past two weeks, did under 5 years old children have diarrhea?

Diarrhea is a condition in which faeces are discharged from the bowels at least three times per day and in a liquid form.

Yes (1) No (2) Don't Know (3)

☐

Number of under 5 years old children with incidence of diarrhea -----

Total number of household members who had diarrhea in the past month-----

20. What are the causes of diarrhea? (can be answered more than one).

Record all responses by ticking ✓ in the box mentioned.

1. Drinking unclean water	
2. Bacteria/virus/other pathogen	
3. Eating contaminated foods	
4. Eating wrong food	
5. Ingesting human or animal waste	
6. Flies and other insects	
7. Bad Spirit	
8. Others-----	
9. Don't know	

21. What do you think how can we prevent having diarrhoea?

1. Don't know	
2. Drinking safe water	
3. Protect food from flies	
4. Handwashing	
5. Use proper sanitary latrine	
6. Eating well cooked food	
7. Clean household surrounding	
8. Proper disposal of children's excreta	
9. Others-----	

22. How do you normally do when you have diarrhea?

1. Don't remember	
2. Nothing done	
3. Local remedies	
4. Illegal practitioner	
5. Traditional medicine	
6. Western medicine	
7. ORS	

23. What do you normally do when your children (under-5 years old) having diarrhea?

1. Don't know/don't remember	
2. Nothing given	
3. Water alone	
4. Water with feeding	
5. Breast milk	
6. Other milk/ milk powder	
7. Oral rehydration solution	
8. Homemade ORS	
9. Boiled rice/ soup	
10. others-----	

Knowledge, Attitude and Practice of Mothers/Care givers' Handwashing Questions

24. Normally, when do you usually wash your hands? Ask them to think their critical times for handwashing. (can be answered more than one). Record all responses by ticking ✓ in the box mentioned.

1. After defecation	
2. Before eating	
3. After eating	
4. After cleaning child's bottom	
5. Before feeding children	
6. After work	
7. After touching waste	
8. When they are dirty	
9. After handling animals	
10. Others	

Mothers/Caregivers hand washing practice	Do you usually wash your hands?	With what do you wash?	How do you wash your hands?
Before taking food			
Before feeding child			
After defecation			
After cleaning child's bottom			
	Always (1) Sometimes (2) Rarely (3) Never (4)	Nothing (1) Water only (2) Soap & Water (3) Ash & Water (4) Rag (5) Others (6)	Thoroughly (1) Superficially (2) Just dip in water (3)

25. What are the advantages of Hand washing? (can be answered more than one). Record all responses by ticking \sqrt in the box mentioned.

1. Hands smell/look better	
2. Prevent disease/ good for health	
3. Foods tastes better	
4. Prevent Cholera	
5. Others -----	
6. Don't know	

26. Where do you mostly dispose the faeces of under three years children?

1. Children always use latrine	
2. Throw into latrine	
3. Animal eaten it	
4. Throw outside the yard	
5. Bury in yard	
6. Leave on the ground	
7. Others-----	
8. No under-3 years children	

27. How do the children at the age of between 3 to 12 years defecate mostly?

1. Latrine	
2. In the fields/bush near household	
3. Outside the yard	
4. In the yard	
5. Through hole from the floor	
7.Others-----	
8. No 3-12 years children	

28. Have you ever heard about the 4 Cleanliness?

1. Clean water	
2. Clean food	
3. Clean latrine	
4. Clean Hand	
5. Don't know	

**29. What activities come to your mind when you talk about personal hygiene?
What else? Any others?**

1. Comb hair	
2. Wash Face	
3. Brush teeth	
4. Take bath daily	
5. Shampoo hair	
6. Hand washing	
7. Cutting nail	
8. Wear washed clothes	
9. Change clothes	
10. Others-----	

30. What are the common health problems in this community?

1. Don't know	
2. Common cold/fever	
3. Cough	
4. Flu	
5. Hypertension	
6. Heart diseases	
7. TB	
8. Diarrhoea/ dysentery	
9. Malaria	
10. Dengue	
11. Respiratory tract infection	
12. Skin diseases	
13. Abdominal pain	
14. Others	

31. Where do you usually go and get treatment when you are ill/sick?

1. Hospital	
2. Health centre	
3. Private clinic	
4. Health assistant/ LHV	
5. Mid-wife	
6. Auxillary Mid-Wife	
7. Community health-worker	
8. Traditional medicine Practitioner	
9. Illegal practitioner	
10. Drug shop	
11. Local remedies	
12. Others-----	

Observation Checklist Question

32. (a) Cleanliness of water container covered?

Yes (1) No (2) ☐

(b) Cleanliness of water pots/buckets for fetching Water

Yes (1) No (2) ☐

(c) Cleanliness of Drinking water pots/cups

Yes (1) No (2) ☐

33. Types of latrine

1. Septic Tank	
2. Clean pour/flush latrine	
3. Indirect pit latrine	
4. Direct pit latrine	
5. Pit latrine (open)	
6. Hanging latrine	
7. Latrine on the bank of river	
8. Damaged latrine	
7.Others-----	

(a) Latrine Functionality

Yes (1) No (2) ☐

Observe status of the toilet facilities cleanliness

1. Presence of water in water pots	
2. Latrines are not locked	
3. No spider web on waterpots	
4. No spider web and garbage in the latrine pan	
5. No dust in the latrine pan	
6. Having Anal Cleaning Stick	
7. Have faeces in latrine pan	
8. Way to latrine is cleaned	
9. Wet floor in latrine	
10. Mentioned they use latrine	

(b) Latrine maintenance

Yes (1)

No (2)

☐

Note: Observe on the status of functionality and cleanliness

(c) Anal Cleaning Material

1. Stick	
2. Water	
3. Paper	
4. Stick and water	
5. Leaf	
6. Stone	
7. Cannot determine	

34. (a) Hand Washing Practices

Yes (1)

No (2)

☐

Note: Observe the presence of hand washing facility near vicinity of latrine.

(b) Is soap available near around Household Compound?

Yes (1)

No (2)

☐

Note: Observe the presence of soap, water pots and ash near vicinity of latrine.

Observation Questions on General Household Environment

35. Cleanliness of household compound/ household environment

1. Presence of human excreta	
2. Presence of animal human excreta	
3. Presence of both animal & human excreta	
4. Surrounding appears free of contaminants or garbage	

36. Presence of stagnant water near household environment

Yes (1) No (2) ☐

37. (a) Presence of drain for outlet of used water

Yes (1) No (2) ☐

(b) Condition of drain

Functioning (1) Blocked (2) ☐

Observation on Cleanliness of Food

38. Cleanliness of Food

Covered (1) Uncovered (2) Don't Know (3) ☐

39. Disposal of leftover food and kitchen waste

Proper disposal (1) Improper disposal (2) ☐

Annex 3: Sample Size Calculation Formula

The sample size for the study was calculated using the following formula.

z^2 = Standard score corresponding to a given confidence level. Example, at 95% Confidence Level or 5% level of significance ($\alpha = 0.05$), $Z = 1.96$.

p = Prevalence of disease in women is 1%

$q = (1 - p)$ or percentage of failure which is $100 - 1 = 99\%$

d = Precision limit or proportion of sampling error which is usually 5% confidence limit.

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

Assuming a precision of 6% at a 95% confidence level:

$$\text{Sample Size} \quad n = \frac{z^2 \times p \times q}{d^2}$$

$$z = 1.96$$

$$p = 0.5$$

$$q = (1 - p)$$

$$d = 0.06$$

$$n = \frac{1.96^2 \times 0.5 \times (1 - 0.5)}{(0.06)^2}$$

$$= \frac{3.84 \times 0.25}{0.0036}$$

$$= \frac{0.96}{0.0036} = 267$$

Considering 10% non-response

$$\text{sample size} = 267 + 10\% \text{ of } 267$$

$$= 267 + 26.7$$

$$= 267 + 27 = 294$$